

**Twelfth Five Year Plan
(2012–2017)
Economic Sectors**

Volume II

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First published in 2013 by



SAGE Publications India Pvt Ltd
B1/I-1 Mohan Cooperative Industrial Area
Mathura Road, New Delhi 110 044, India
www.sagepub.in

SAGE Publications Inc
2455 Teller Road
Thousand Oaks, California 91320, USA

SAGE Publications Ltd
1 Oliver's Yard, 55 City Road
London EC1Y 1SP, United Kingdom

SAGE Publications Asia-Pacific Pte Ltd
33 Pekin Street
#02-01 Far East Square
Singapore 048763

Published by Vivek Mehra for SAGE Publications India Pvt Ltd, Phototypeset in 11/13pt Minion Pro by RECTO Graphics, Delhi and printed at Saurabh Printers, New Delhi.

Library of Congress Cataloging-in-Publication Data Available

ISBN: 978-81-321-1131-3 (PB)

The SAGE Team: Rudra Narayan, Archita Mandal, Rajib Chatterjee and Dally Verghese

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Volume II



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Planning Commission
Government of India

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Acronyms

2G/3G/4G	Second Generation/Third Generation/Fourth Generation	ASSOCHAM	Associated Chamber of Commerce
AAI	Airport Authority of India	ATC	Air Traffic Control
AAY	Antodaya Anna Yojana	ATF	Automatic Transmission Fluid
ACA	Additional Central Assistance	ATFC	Agriculture Technology Forecast Centre
ACC	Artisan Credit Card	ATIs	Administrative Training Institutes
ACS	Average Cost of Supply	ATMAs	Agriculture Technology Management Agency
ADB	Asian Development Plan	ATS	Apprentice Training Scheme
ADC	Access Deficit Charges	B.P.Ed.	Bachelor of Physical Education
ADDA	Asansol Durgapur Development Authority	BAF	Batch Annealing Furnace
AES	Acute Encephalitis Syndrome	BC	Business Correspondent
AI	Artificial Insemination	BCM	Billion cubic metres
AIBP	Accelerated Agriculture Benefit Programme	BDOs	Block Development Officers
AIC	Agricultural Insurance Corporation	BE	Budgetary Estimate
AIR	All India Radio	BEE	Bureau of Energy Efficiency
AIU	Association of Indian Universities	BEML	Bharat Earth Movers Ltd.
AL	Arable Land	BFDA	Brackish water Farmers Development Agencies
AML	Anti-Money Laundering	BFO	Business Facilitation Officer
AMM	Abandoned mine methane	BHEL	Bharat Heavy Electricals Ltd.
AMPC	Automated Mail Processing Centre	BIPP	Biotechnology Industry Partnership Programme
ANM	Auxiliary Nurse Midwife	BIRAP	Biotechnology Industry Research Assistance Programme
AnSI	Anthropological Survey of India	BIS	Bureau of Indian Standards
AOC	Agreement of Collaboration	BLY	Bachat Lamp Yojana
APL	Above Poverty Line	BMPTC	Building Material and Technology Promotion Council
APMC	Agriculture Produce Marketing Committee	BORL-Bina	Bharat Oman Refineries Limited
APMSS	Andhara Pradesh Mahila Samakhya	BOT	Build-Operate-Transfer
APO	Assistant Programme Officer	BPCL	Bharat Petroleum Corporation Limited
ARPU	Average Revenue Per User	BPL	Below Poverty Line
ARR	Average Revenue Realised	BPO	Branch Post Office/ Business Process Outsourcing
ARYA	Attracting & Retaining Youth in Agriculture	BPR	Business Process Re-engineering
ASHA	Accredited Social Health Activist	BRCs	Block Resource Centres
ASI	Archaeological Survey of India		
ASPIRE	Agriculture Science Pursuit for Inspired Research Excellence		

BRO	Border Roads Organisation	CGP	Cluster of Gram Panchayats
BRT	Bus Rapid Transit System	CGRF	Consumer Grievance Redressal Forum
BSUP	Basic Services to the Urban Poor		
BTKM	Billion Tonne Kilometre	CH4. CO	Methane, Carbon Monoxide
BU	Billion Unit	CHPs	Coal Handling Plants
BWA	Broadband Wireless Access	CIDC	Construction Industry Development Council
C&AG	Comptroller & Auditor General		
CA	Conservation Agriculture	CIT	Confederation of Indian Industries
CACP	Commission for Agriculture Costs & Prices	CLCSS	Credit Linked Capital Subsidy Scheme
CAG	Comptroller and Auditor General	CM	Confederation of Indian Industries
CAGR	Compound Annual Growth Rate	CMA	Counter Magnet Area
Cal/Kg	Calorie/ kilogramme	CMM	Coal mine methane
capex	Capital expenditure	CMPDIL	Central Mine Planning and Design Institute
CBDT	Central Board of Direct Taxation		
CBM	Coal bed Methane	CMSA	Community Managed Sustainable Agriculture
CBOs	Community Based Organisations		
CBRM	Capacity Building and Reform Management	CNG	Compressed natural gas
		CPCB	Central Pollution Control Board
CCDA	Coal Conservation and Development Act	CPCL	Chennai Petroleum Corporation Limited
CCL	Central Coalfields Limited		
CCRF	Code of Conduct for Responsible Fisheries	CPE	Customer Premises Equipment
		CPIAL or CPIIW	Consumer Price Index for Agricultural Labour/Consumer Price Index for Industrial Workers
C-DAP	Comprehensive District Agriculture Plants		
C-DOT	Centre for Development of Telematics	CPIS	Coconut Palm Insurance Scheme
		CPMG	Chief Post Master General
CDP	City Development Plans	CPPs	Captive power plants
CEA	Central Electricity Authority	CPWD	Central Public Works Department
CEF	Citizen Engagement Framework	CREDAI	Confederation of Real Estate Developers' Associations of India
CEIG	Chief Electrical Inspectorate to Govt. of India		
		CRPs	Community Resource Persons
CERC	Central Electricity Regulatory Commission	CRRI	Central Road Research Institute
		CRRI-In	Indian Computer Emergency Response Team
CERT	Computer Emergency Response Team	CSC	Cluster Stimulation Cell/Common Services Centre
CERT-In	Indian Computer Emergency Response Team	CSIR	Council for Scientific and Industrial Research
CETP	Common Effluent Treatment Plant		
CeWiT	Centre for Excellence in Wireless Technology	CSO	Central Statistical Organisation/ Civil Society Organisation
		CSR	Corporate Social Responsibility
CFI	Construction Federation of India	CSS	Centrally Sponsored Scheme
CFSI	Children Film Society of India	CST	Central Sales Tax/Concentrating Solar Technology
CFT	Cluster Facilitation Team/ Combating of Financing of Terrorism		
		CTL	Coal to liquid
		CUF	Capacity Utilisation Factor
CGD	City Gas Distribution	CVO	Chief Vigilance Officer

C-WET	Centre for Wind Energy Technology	DWDM	Dense Wavelength Division Multiplexing
CWG	Common Wealth Games	E&P	Exploration and Production
DAC	Department of Agriculture & Cooperation	companies	Companies
DAE	Department of Atomic Energy	EBP	Ethanol Blended Petrol Programme
DAHDF	Department of Animal Husbandry, Dairying & Fisheries	Programme	
DALY	Disability Adjusted Life Years	ECB	External Commercial Borrowing
DAP	Di Ammonium Phosphate	ECBC	Energy Conservation Building Code
DARE	Department of Agricultural Research & Education	ECO	Local Cable Operators
DAS	Digital Addressable System	EDGE	Enhanced Data for Global Evolution
DAVP	Directorate of Advertisement and Visual Publicity	EDMC	Electronic Design and Manufacturing Cluster
DBT	Department of Bio-technology	EDS	Electronics Delivery of Services
DCI	Dredging Corporation of India	EEZ	Exclusive Economic Zone
DD	Doordarshan	EFC	Expenditure Finance Committee
DeitY	Department of Electronics and Information Technology	eFMS	Electronic Fund Management System
DEMU/	Diesel-Electric Multiple Unit/	EIAs	End Implementing Agencies
MEMU	Mainline Electric Multiple Unit	EIL	Engineers India Limited
DFC	Dedicated Freight Corridor	EM	Entrepreneur's Memorandum
DFP	Directorate of Field Publicity	EMC	Electronics Manufacturing Cluster
DGCA	Directorate General of Civil Aviation	EMMC	Electronic Media Monitoring Centre
DGH	Director General of Hydrocarbons	EMSC	Environmental Measures and Subsidence Control scheme
DGPS	Differential Global Positioning System	EMU	Electric Multiple Unit
DIPP	Department of Industrial Policy and Promotion	EOL	Essar Oil Ltd
DIPP	Department of Industrial Policy and Promotion	EPC	Engineering Procurement and Construction
DoP	Department of Posts	ERP	Enterprise resource planning
DoT	Department of Telecommunication	ESDM	Electronics System Design & Manufacturing
DP	Development Plan	ETP	Effluent Treatment Plant
DPC	District Programme Coordinator	EWS	Economically Weaker Sections
DPRs	Detailed Project Reports	EXIM	Export Import
DPSU	Defence Public Sector Undertaking	FAB	Fabrication Unit
DRDA	District Rural Development Agency	FAO	Food and Agriculture Organisation
DRDO	Defence Research & Development Organisation	FAR	Floor Area Ratio
DRI	Differential Rate of Interest	FDI	Foreign Direct investment
DRM	Digital Radio Mondiale	FFDAs	Fish Farmers Development Agencies
DSM	Demand side management	FICCI	Federation of Indian Chamber of Commerce & Industry
DSS	Decision Support System	FM	Frequency Modulation
DST	Department of Science & Technology	FMD	Foot & Mouth Disease
DTC	Direct Tax Code	FO/LSHS	Furnace oil/Low Sulphur Heavy Stock
DTH	Direct to Home	FOLD	Forum of Load Dispatchers

FoR	Forum of Regulators	HMCP	Hardware Manufacturing Cluster Park
FPOs	Farmer Producer Organisation		
FPS	Fair Price Shop	HMEL	Hindustan Mittal Energy Limited
FRBM	Fiscal Responsibility and Budget Management Rules	HMT	Hindustan Machine Tools
		HPCL	Hindustan Petroleum Corporation Limited
FSA	Fuel Supply Agreement		
FSI	Floor Space Index	HPEC	High Powered Expert Committee
FSRU	Floating Storage & Regasification units	HPOs	Head Post Offices
		HPT	High Power Transmitter
FTA	Free Trade Agreement	HRD	Human Resource Development
FTII	Films and Television Institute of India	HRSS	High Resolution Seismic Survey
		HS	Herorrhagic Septicemia
FYP	Five Year Plan	HSIL	High Surge Impedance Loading
GAIL	Gas Authority of India Ltd	HTLS	High Temp. Low Sag
GBI support	Generation based incentive support	HTREL	High-tech Reconnaissance & Exploration Licences
GBS	Gross Budgetary Support		
GCF	Gross Capital Formation	HUDCO	Housing and Urban Development Corporation
GCV	Gross calorific value		
GDP	Gross Domestic Product	HUMS	Indian Institutes of Urban Management
GIPCL	Gujarat Industries Power Company Ltd	I&B	Information & Broadcasting
		IAAS	Integrated Agro-Meteorological Advisory Service
GIS	Geographical Information System		
GKMS	Gramin Krishi Mausam Seva	IAASTD	International Assessment of Agricultural Knowledge, Science & Technology for Development
GMO	Genetically Modified Organisms		
GOI	Government of India	IAP	Integrated Action Plan
GoI-UNDP	Government of India-United Nations Development Programme	IAY	Indira Awaas Yojana
		IBF	Indian Broadcasting Foundation
GPR	Ground Penetrating Radar	IBIN	India Backbone Implementation Network
GPS	Global Positioning System		
GPs	Gram Panchayats	IBM	Indian Bureau of Mines
GQ	Golden Quadrilateral	IBP	Indian Broadcasting Foundation
GRIHA	Green Rating for Integrated Habitat Assessment	IBS	In Building Solutions
		IC	Integrated Circuit
GSDP	Gross State Domestic Product	ICAR	Indian Council of Agricultural Research
GSI	Geological Survey of India		
GSM	Global System for Mobile Communication	ICD	Inland Container Depot
		ICF	Integrated Coach Factory
GST	Goods and Services Tax	ICMR	Indian Council of Medical Research
GT	Gross Tonne	ICRIS	Integrated Coal Resource Information System
GTO/IGBT	Gate Turn Off (Thyrister)/Insulated Gate Bipolar Transistor	ICT	Information and Communication Technology
		ICTE	Information, Communication Technology and Electronics
GW	GigaWatt		
HD	High Definition	IDA	International Development Association
HDTV	High Definition Television		
HEC	Heavy Engineering Corporation		
HEIs	Higher Educational Institutions		
HEMM	Heavy earth moving machinery		
HITS	Headend In The Sky		

IEBR	Internal and Extra Budgetary Resources	IPR	Intellectual Property Rights
IEC	Information Education and Communication	IPTV	Internet Protocol Television
IFFI	International Film Festival of India	IPV 4/IPV 6	Internet Protocol version 4/Internet Protocol version 6
IGNDPS	Indira Gandhi National Disability Pension Scheme	IRDA	Insurance Regulatory Development Authority
IGNOAPS	Indira Gandhi National Old Age Pension Scheme	IRDP	Integrated Rural Development Programme
IGNWPS	Indira Gandhi National Widow Pension Scheme	ISO	Indian Standard Organisation
IHHL	Individual Household Latrine	ISPRL	Indian Strategic Petroleum Reserve Ltd
IHSDP	Integrated Housing & Slum Development Programme	ISRO	Indian Space Research Organisation
IIDS	Integrated Infrastructural Development Scheme	ISSHUP	Interest Subsidy Scheme for Housing and Urban Poor
IIFCL	India Infrastructure Finance Company Limited	IT	Information Technology
IIHT	Indian Institute of Handloom Technology	ITA-1	Information Technology Agreement-1
IIIT	Indian Institute of Information Technology	ITI	Indian Telephone Industries
IIPA	Indian Institute of Public Administration	ITIs	Industrial Training Institutes
IISc	Indian Institute of Science	IT-ITeS	Information Technology-and Information Technology enabled Service
IIT	Indian Institute of Technology	IVRS	Interactive Voice Response System
IIMUMs	Indian Institutes of Urban Managements	IWAI	Inland Waterways Authority of India
ILCS	Integrated Low Cost Sanitation Scheme	IWT	Inland Waterways Transport
ILRIS	Integrated Lignite Resource Information System	JE	Japanese Encephalitis
IMD	Indian Meteorological Department	JLGs	Joint Liability Groups
IMEI	International Mobile Equipment Identity	JMP	Joint Monitoring Programme
IMIS	Integrated Management Information System	JNNURM	Jawaharlal Nehru National Urban Renewal Mission
IMPCC	Inter Media Publicity Coordination Committee	JNNUSM	Jawaharlal Nehru National Solar Mission
IMT	International Mobile Telecommunications	JRDA	Jharia Rehabilitation and Development Authority
INDIPEX	India International Philatelic Exhibition	JV	Joint Venture
IOCL	Indian Oil Corporation Limited	JWGs	Joint Working Groups
IP	Intellectual Property/Internet Protocol	KCC	Kisan Credit Card
IPM	Integrated Pest Management	Kgoe/US\$	Kilogramme of Oil Equivalent/US Dollar
		KVIC	Khadi & Village Industries Corporation
		KVK	Krishi Vigayan Kendra
		KVs	Kendriya Vidyalayas
		kW	Kilo Watt
		Kwh	Kilowatt hour
		L. km	Line kilometre

LAD	Least Assured Depth	MM-III	Mini Mission III
LARR	Land Acquisition and Rehabilitation and Resettlement Bill, 2011	MMP	Mission Mode Project
LBFL	Local Bodies Finance List	MMSCMD	Million Metric Standard Cubic Metre Per Day
LCO	Local Cable Operators	MMT	Million Metric Tonnes
LDBs	Livestock Development Boards	MMTOE	Million tones oil equivalent
LDC	Land Development Corporation	MMTPA	Million Metric Tonne Per Annum
LDO	Light Diesel Oil	MNAIS	Modified National Agricultural Insurance Scheme
LEED	Leadership in Energy & Environmental Design	MNRE	Ministry of New and Renewable Energy
LHB	Linke Holfmann Busch	MoA	Ministry of Agriculture
LIGs	Low Income Group	MoC	Ministry of Coal
LNCPE	Laxmibai National College of Physical Education	MoHUPA	Ministry of Housing and Urban Poverty Alleviation
LNG	Liquefied natural gas	MoP	Ministry of Power
LPG	Liquefied Petroleum Gas	MoP&NG	Ministry of Petroleum and Natural Gas
LPT	Low Power Transmitter	MoRD	Ministry of Rural Development
LR	Land Readjustment	MoRTH	Ministry of Roads Transport & Highways
LTCCS	Long Term Cooperative Credit Structure	MoSPI	Ministry of Statistics & Plan Implementation
LTE	Long Term Evolution	MOT	Multi-organisation Team/ Muriate of Potash
LWE	Left Wing Extremism	MoU	Memorandum of Understanding
M&A	Mergers and Acquisitions	MoUD	Ministry of Urban development
M.P.Ed.	Master of Physical Education	MPCs	Metropolitan Planning Committees
MA	Moving Average	MRP	Maximum Retail Price
MANAGE	National Institute for Agriculture Extension and Management	MRPL	Mangalore Refinery and Petrochemicals Limited
MAT	Minimum Alternative Tax	MS	Motor spirit
Mbps	Megabits per second	MSE-CDP	Cluster Development Programme of the M/o MSME
MCCL	Mahanadi Coalfields Limited	MSEFC	Micro & Small Enterprise Facilitation Councils
MCS	Monitoring, Control and Surveillance	MSIPS	Modified Special Incentive Programme Scheme
MDI	Management Devolution Index	MSME	Micro, Small & Medium Enterprise
MDRR	Mines and Minerals (Development and Regulation) Bill, 2011	MSMED Act	MSME Development Act, 2006
MEA	Ministry of External Affairs	MSP	Minimum Support Price
MES	Minimum Economic Size	MT	Million Tonnes
MFIs	Microfinance Institutions	MTA	Mid-term Appraisal
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act	MTEE	Market Transformation for Energy Efficiency
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme	MTOE	Million tons of oil equivalent
MGR	Merry-Go-Round	MW	Medium Wave/Megawatt
MHz/GHz	Mega Hertz/Giga Hertz	MWe	Megawatt electrical
MIS	Management Information System		
MITI	Ministry of International Trade and Industry, Japan		
MMBTL	Million Metric British Thermal Unit		

MWp.	Megawatt Peak	NGRCA	National Gender Resources Centre in Agriculture
NABARD	National Bank for Agriculture and Rural Development	NGRI	National Geophysical Research Institute
NABFINS	NABARD Financial Services	NHAI	National Highway Authority of India
NAC	Non Agricultural use of Land	NHB	National Horticulture Board/ National Housing Bank
NADA	National Anti-Doping Agency	NHDP	National Highway Development Programme
NAIS	National Agricultural Insurance Scheme	NHM	National Horticulture Mission
NAPCC	National Action Plan on Climate Change	NIA	Net irrigated area
NARS	National Agriculture Research System	NICRA	National Initiative on Climate Resilient Agriculture
NATRIP	National Automotive Testing and R&D Infrastructure Project	NIMZ	National Investment and Manufacturing Zone
NAVA	National Audio-Visual Archives	NIPER	National Institute of Pharmaceutical Education & Research
NBA	News Broadcasters Association/ Nirmal Bharat Abhiyan	NIS	National Institute of Sports
NBECI	National Bio Energy Corporation of India	NISC	National Institute of Sports Coaching
NBFCs	Non-Banking Finance Companies	NISSM	National Institute of Sports Science and Sports Medicine
NBS	Nutrient Based Subsidy	NIUA	National Institute of Urban Affairs
NCC	National Cadet Corps	NKN	National Knowledge Network
NCP	National Competition Policy	NLCPR	Non-Lapsable Central Pool of Resources
NCR	National Capital Region	NLP	Natural Language Processing
NCTE	National Council of Teacher Education	NMCC	National Manufacturing Competitiveness Council
NDDDB	National Dairy Development Boards	NMCP	National Manufacturing Competitiveness Programme
NDP	National Dairy Plant	NMEEE	National Mission for Enhanced Energy Efficiency
NDTL	National Dope Test Laboratory	NMSA	National Mission for Sustainable Agriculture
NE	North East	NMSH	National Mission on Sustainable Habitat
NEF	National Electricity Fund	NMT	Non-Motorised Transport
NEGP	National e-Governance Plan	NOCL	Nagarjuna Oil Corporation Limited
NERUDP	North Eastern Region Urban Development Programme	NOFN	National Optical Fibre Network
NELP	New Exploration Licensing Policy	NPBB	National Programme for Bovine Breeding
NER	North Eastern Region	NPBBD	National Programme for Bovine Breeding and Dairy
NFAP	National Frequency Allocation Plan	NPCBB	National Project for Cattle & Buffalo Breeding
NFBS	National Family Benefit Scheme	NPFAI	National Playfields Association of India
NFDB	National Fisheries Development Board		
NFDC	National Film Development Corporation		
NFSA	National Food Security Act		
NFSB	National Food Security Bill		
NFSM	National Food Security Mission		
NGN	Next Generation Network		
NGO	Non-Governmental Organisation		
NGP	Nirmal Gram Puraskar		

NPFP	National Physical Fitness Programme	NVG	National Voluntary Guidelines on Soc., Env., & Eco Responsibility for Business
NPK	Nitrogen Phosphorous & Potash		
NPM	Non-Pesticidal Management of Pests	NVs	Navodaya Vidyalayas
		NYC	National Youth Corps
NPMSH&F	National Project on Management of Soil Health & Fertility	NYKs	Nehru Yuva Kendras
NPS	New Pension Scheme/ New Pricing Scheme	O&M	Operation & Maintenance
		O+OEG	Oil and oil equivalent gas
NPYAD	National Programme for Youth and Adolescent Development	OBCs	Other Backward Classes
		ODF	Open Defecation Free
NRAA	National Rained Area Authority	OFB	Ordinance Factory Board
NRDWP	National Rural Drinking Water Programme	OIL	Oil India Limited
		OMCs	Oil Marketing Companies
NREGS	National Rural Employment Guarantee Scheme	OMS	Output per man shift
		OMT	Operate-Maintain-Transfer
NRL	Numaligarh Refinery Limited	ONGC	Oil and Natural Gas Corporation Limited
NRLM	National Rural Livelihood Mission		
NSAP	National Social Assistance Programme	OVL	ONGC Videsh Ltd
		oya	Year on Year Average
NSD	National School of Drama	PACS	Primary Agriculture Cooperative Society
NSDC	National Skill Development Corporation	PAPU	Pan African Postal Union
		PAT	Perform, Achieve & Trade
NSDF	National Skill Development Fund	PATM	Perform, Achieve and Trade Mechanism
NSF	National Sports Federation		
NSIC	National Small Industry Corporation	PCB	Pollution Control Board
NSNIS	Netaji Subhas National Institute of Sports	PCU	Policy Coherence Unit
		PDAs	Pension Distribution Agencies
NSS	National Sample Survey/National Service Scheme	PEARL	Peer Experience and Reflective and Reflective Learning
NSSO	National Sample Survey Office/ National Sample Survey Organisation	PHPDT	Peak Hour Peak Direction Traffic
		PIB	Public Information Bureau
NSUP	National Urban Sanitation Policy	PIC	Public Information Campaign
NTDPC	National Transport Development Policy Committee	PKM	Passenger Kilometre
		PLB	Public Land Banks
NTKM	Net Tonne Kilometre	PLI	Postal Life Insurance
NTP	National Telecom Policy	PMEGP	Pradhan Mantri Employment Guarantee Programme
NTPC	National Thermal Power Corporation	PMGSY	Pradhan Mantri Grameen Sadak Yojna
NTS	National Institute of Sports	PNG	Piped natural gas
NUHHP	National Urban Housing and Habitat Policy	PNGRB	Petroleum and Natural Gas Regulatory Board
NULM	National Urban Livelihood's Mission	POL	Petroleum, Oil and Lubricant
		POLIF	Post Office Life Insurance Fund
NURTA	National Urban Rail Transit Authority	POs	Post Offices
		POSOCO	Power System Operation Corporation Limited

PPAC	Petroleum Planning and Analysis Cell	RGNIYD	Rajiv Gandhi National Institute of Youth Development
PPAs	Power purchase agreement	RHF	Rural Housing Fund
PPP	Public-Private Partnership	RIA	Regulatory Impact Analysis
PPPP	People Private-Public Partnership	RIDF	Rural Infrastructure Development Fund
PPPIAD	Public-Private Partnership for Integrated Agricultural Development	RIL	Reliance Industries Limited
PPVFRA	Protection of Plant Variety & Farmers Rights Authority	RIL-KG	Reliance Industries Limited-Krishna Godavari Basin
PRGF	Partial Risk Guarantee Fund	RIS	River Information System
PRIs	Panchayati Raj Institutions	RITES	Rail India Techno Economic Services
Provi.	Provisional	RKVY	Rashtriya Krishi Vikas Yojana
PSB	Public Service Broadcaster	RMSA	Rashtriya Madhyamik Shiksha Abhiyan
PSCs	Production Sharing Contracts	ROB/RUB	Road Over Bridge/ Road Under Bridge
PSUs	Public Sector Undertakings	RoW	Right of Way
PTA	Preferential Trade Agreement	RPLI	Rural Postal Life Insurance
PURA	Provision of Urban Amenities in Rural Areas	RPO	Renewable Purchase Obligation
PWD	Public Works Department	RPOLIF	Rural Post Office Life Insurance Fund
PWSS	Piped Water Supply System	RTS	Regional Rapid Transit System
PYD	Programme for Youth Development	RTE	Right to Education
PYKKA	Panchayati Yuva Khel aur Krida Abhiyan	RUDSETIs	Rural Development and Self-Employment Training Institutes
R&D	Research and Development	S&DD	Song and Drama Division
R&M AND LE	Renovation & Modernisation and Life Extension	S&L	Standards and Labelling
R&R	Rehabilitation and Resettlement	SAD	Special Additional Duty
R/P ratios	Reserves-to-Production ratio	SAGES	Goaf edge supports
R-ABDRP	Restructured Accelerated Power Development and Reforms Programme	SAMETIs	State Agriculture Management Extension & Training Institutions
RAY	Rajiv Awas Yojana	SARDP-NE	Special Accelerated Road Development Programme for the North East
RBCs	Rural Building Centres	SAT	Sports Authority of India
RCUES	Regional Centres of Urban and Environment Studies	SAU/SAUs	Social Audit Unit/State Agricultural Universities
RDF	Rural Development Flexi-fund	SBD	Standard bid documents
RDSO	Research Design and Standards Organisation	SCCL	Singareni Collieries Company Limited
RE bonds	Renewable Energy bonds	SCs	Scheduled Castes
RE	Revised Expenditure	SCSP	Scheduled Castes Sub-Plan
READY	Rural Entrepreneurship & Awareness Development Yojana	SDO	Standard Developing Organisations
REC	Renewable Energy Certificate	SDTV	Standard Definition Television
RFD	Result Framework Document	SEB	State Electricity Board
RFID	Radio Frequency Identification	SEBI	Security & Exchange Board of India
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana	SECC	Socio-Economic and Caste Census

SECF	Contribution to State Energy Conservation Fund	TMNE (NE)	Technology Mission for North Eastern Region
SFAC	Small Farmers Agribusiness Consortium	TNUDP	Tamil Nadu Urban Development Fund
SFCs	State Finance Commission	TOD	Time of Day
SGSY	Swarnajayanti Gram Swarozgar Yojana	TOPS	Terrestrial Observation & Prediction System
SHBs	State Housing Boards	TPDS	Targeted Public Distribution System
SHGs	Self-Help Groups	TPSs	Town Planning Schemes
SIBRI	Small Industry Business Research Initiatives	TQM	Total Quality Management
SITP	Scheme for Integrated Textile Park	TSC	Total Sanitation Campaign
SJSRY	Swarna Jayanti Sahari Rozgaar Yojana	TSDO	Telecom Standards Development Organisation
SKO	Superior Kerosene Oil	TSP	Telecom Service Provider/Tribal Sub-Plan
SLNA	State-Level Nodal Agency	TUFS	Technology Upgradation Fund Scheme
SLSC	State Level Sanctioning Committee	UC	Utilization Certificate
SME	Small and Medium Enterprise	UCG	Underground Coal Gasification
SOC	Soil Organic Carbon	UGC	University Grants Commission
SOE	State Owned Enterprise	UHV	Useful heat value
SOP	Standard Operating Producer	UID	Unique Identification
SoRs	Schedule of Rates	UID	Unique Identification—AADHAR
SPTLs	State Pesticide Testing Laboratory	UIDSSMT	Urban Infrastructure Development for Small & Medium Towns
SPV	Special Purpose Vehicle	UIG	Urban Infrastructure and Governance
SRFTI	Satyajit Ray Film and Television Institute	UK	United Kingdom
SRI	System of Rice Intensification	ULBs	Urban Local Bodies
SSA	Sarva Shiksha Abhiyan	ULIP	Unit Linked Insurance Plan
STB	Set Top Box	UMPPs	Ultra Mega Power Projects
STL	Short term liabilities	UMTA	Unified Metropolitan Transport Authority
STOA	Short-Term Open Access	UNICEF	United Nations Children's Fund
STs	Scheduled Tribes	UPU	Universal Postal Union
STU/CTU	State Transmission Utilities/Central Transmission Utility	USA	United States of America
SW	Short Wave	USEPA	United States Environment Protection Agency
SWAN	State Wide Area Network	USHA	Urban Statistics for HR Assessment
TCF	Trillion cubic feet	USIS	Urban Sport Infrastructure
TCIL	Telecommunications Consultants India Ltd	USOF	Universal Service Obligation Fund
TCoE	Telecom Centres of Excellence	UT	Urban Transport
TDB	Technology Development Board	VAS	Value Added Services
TDR	Transfer of Development Rights	VAT	Value Added Tax
TDRs	Tradable Development Rights	VCFEE	Venture Capital Fund for Energy Efficiency
TDSAT	Telecom Disputes Settlement Appellate Tribunal	VFX	Visual Effects
TEC	Telecom Engineering Centre	VGF	Viability Gap Funding
TFP	Total Factor Productivity		
TISCO	Tata Iron and Steel Company Limited		

VLFM	Visionary Leadership for Manufacturing	WHO	World Health Organisation
VLPT	Very Low Power Transmitter	WiPS	Wireless Intrusion Prevention System
VoIP	Voice Over Internet Protocol	WRDA	Warehouse Regulatory & Development Authority
VUs	Vehicle Units	WSCs	Weavers' Service Centres
VWSC	Village Water and Sanitation Committee	WTO	World Trade Organisation
WBCIS	Weather Based Crop Insurance Scheme	XGPON	Next Generation Gigabit Passive Optical Network
WDM-PON	Wavelength Division Multiplexed Passive Optical Network		

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12

Agriculture

INTRODUCTION

12.1. Although agriculture now accounts for only 14 per cent of Gross Domestic Product (GDP), it is still the main source of livelihood for the majority of the rural population. As such rapid growth of agriculture is critical for inclusiveness. Important structural changes are taking place within the sector and there are definite signs of improved performance. Agricultural growth has accelerated compared to the Tenth Plan and diversification is proceeding (Table 12.1). The National Sample Survey Organisation (NSSO) data brings out that rural labourers are shifting to non-agricultural work, tightening the labour market in agriculture and putting pressure on farm wages. However, dependence on agriculture remains unchanged among the rural self-employed whose average farm size continues to

decline with population growth. This is also an ageing, more feminised population, whose educated young members are less likely to want to stay in farming. The viability of farm enterprise, mostly small farms, must therefore be a special area of Plan focus in the Twelfth Plan. The Plan must also focus on other priorities such as resource-use efficiency and technology to ensure sustainability of natural resources, adaptation to climate change and improvements in total factor productivity.

RECENT TRENDS: PERFORMANCE AND POINTERS

GDP Growth

12.2. The average of annual growth rates of GDP in agriculture and allied sectors during the Eleventh

TABLE 12.1
Growth Rate of Agricultural and Allied Sectors

Plan	Share of Agriculture in the Economy	Growth Rate of Agriculture and Allied Sectors	Growth Rate of Total Economy
(in percentage)			
(All Figures based on 2004–05 prices)			
Ninth Five Year Plan	23.4	2.5	5.7
Tenth Five Year Plan	19.0	2.4	7.6
Eleventh Plan (2007–08 to 2011–12)			
2007–08	16.8	5.8	9.3
2008–09	15.8	0.1	6.7
2009–10	14.7	1.0	8.4
2010–11 (Quick Est.)	14.5	7.0	8.4
2011–12 (Rev Est.)	14.0	2.8	6.5
Eleventh Plan Average	15.2	3.3	7.9

2 Twelfth Five Year Plan

Five Year Plan is now placed at 3.3 per cent. This is short of the target of 4 per cent but is significantly better than the achievement of 2.4 per cent in the Tenth Plan. Failure to reach the target growth is one reason for the high inflation in prices of food and other primary commodities that persist despite the recent slowdown in overall GDP growth. Consequently, although the overall GDP growth target of the Twelfth Plan has been revised down since the Approach Paper, the growth target for agriculture is maintained at 4 per cent.

12.3. A natural question which arises is whether the target of 4 per cent is attainable in view of past shortfalls. Although growth trends and targets are subject to high errors due to weather variability (for example, the Eleventh Plan average was pulled down by two successive bad harvests in 2008–09 and 2009–10), there is reason for cautious optimism because the turn-around that began after 2004 appears to be maintaining its momentum. Figure 12.1 plots averages and standard deviations of annual growth rates over moving five-year periods, a trend of the growth averages and also annualised five-year growth rates based on five-year moving averages. All these show growth still trending up and variability reducing. The Eleventh Plan growth rate based on five-year moving averages is at 3.6 per cent, the highest for any

five-year period ever and, significantly, growth variability has also reduced to lowest ever.

12.4. The reduction in variability is important since claims of acceleration or deceleration make sense only when variability is low. Also, it is a measure of how well the system is able to cope with inevitable bouts of aberrant weather and yet maintain the growth momentum. It should be noted that agricultural growth was positive in 2009–10 despite the worst drought in nearly 40 years. More generally, whereas earlier periods saw at least one and normally two years of negative growth in every five year, there has not been a single year of negative growth of agriculture and allied sectors after 2002–03.

12.5. The magnitude of secular decline in growth variability over the last 30 years is also important. This is now less than a third of its peak. A major role must have been played by the increase in irrigation from about 20 per cent of arable area in 1981 to 35 per cent today, based mainly on groundwater. However, since water tables have fallen and temperatures risen, the extent of variability decline is surprisingly large. Even assuming zero variability on irrigated land, this implies that variability on rain-fed land must have reduced very substantially. Clearly factors such as a more diversified agriculture,

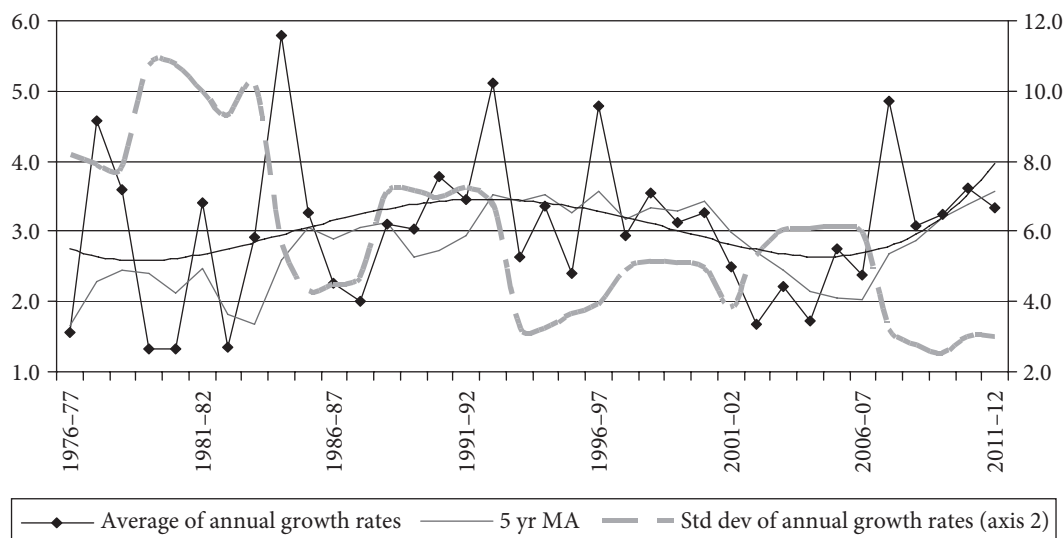


FIGURE 12.1: Growth and Fluctuations in GDP Agriculture and Allied

extended information reach and investments both on-farm and in watershed development, appear to have enabled better responses to depleting natural resources and weather risk. Although there is considerable scope to improve each of these factors further, it is a matter of satisfaction that developments in these areas are having a positive effect.

The Climate Challenge

12.6. The climate challenge facing agriculture needs to be taken seriously. Table 12.2 shows a distinct trend towards both drier and warmer weather, particularly during the last three Plan periods. Rainfall in context of agriculture has traditionally been discussed in terms of the monsoon (that is, June–September) but annual precipitation is probably much more relevant now since the dominance of Kharif crops has reduced. Viewed in this perspective, it is noteworthy that each of the last three Plan periods has recorded lower mean rainfall and higher rainfall variability compared to the immediately previous period. Three (2008, 2009 and 2011) of the five Eleventh Plan years had annual rainfall below 95 per cent of long period average, as compared to only five in the previous 15 years. Temperature conditions have deteriorated even more. Periods prior to 1997 can be considered normal, but warming has increased at an accelerating pace since then. The Eleventh Plan period contained the two warmest years (2010 and 2009) ever recorded since 1900.

Even the coolest year (2008) during these five years was the thirteenth warmest in the last 110 years.

State-wise performance

12.7. The Mid-term Appraisal of the Eleventh Plan (MTA) had noted that the recovery in agriculture after 2004 was associated with clear signs of renewed dynamism in rain-fed areas. Table 12.3, presents state-wise averages and standard deviations of annual growth rates of Gross State Domestic Product (GSDP) from agriculture and allied activities for four separate periods since 1981–82. It clearly shows the following:

1. The all-States average and median growth rates of GSDP recovered beyond levels before mid-1990s, to reach near 4 per cent in the period after 2004–05, this also happened individually in many states, particularly those with large rain-fed areas. The states with best performance were Jharkhand, Chhattisgarh, Manipur, Tripura, Mizoram, Rajasthan, Gujarat, Maharashtra, Karnataka and Andhra Pradesh, all with above 5 per cent growth.
2. Despite more difficult weather conditions, all except few hill states managed substantial reduction of growth variability (measured by standard deviation of annual growth rates) during 2005–12 as compared to the past.

TABLE 12.2
Some Weather Details

	1951/52 to 1967/68	1968/69 to 1980/81	1981/82 to 1990/91	1991/92 to 1996/97	1997/98 to 2001/02	2002/03 to 2006/07	2007/08 to 2011/12
Annual Rainfall (cm)							
Mean	122.5	118.7	120.1	121.0	118.5	113.7	111.7
Standard Deviation	12.5	10.2	11.5	7.2	8.3	9.4	10.0
Monsoon Rainfall (cm)							
Mean	91.9	88.8	88.8	90.0	87.8	83.9	86.6
Standard Deviation	10.1	9.6	11.0	6.5	5.5	7.9	9.7
Annual Temperature anomaly from normal (°C)							
Mean	0.04	–0.03	0.09	0.19	0.34	0.56	0.65
Standard Deviation	0.28	0.24	0.03	0.10	0.22	0.11	0.26

Source: Climate bulletins and other publications of the India Meteorological Department.

4 Twelfth Five Year Plan

TABLE 12.3
Averages and Standard Deviations of Annual Growth Rates of GSDP from Agriculture and Allied Sectors

	Average of Annual Growth Rates				Standard Deviation of Annual Growth Rates			
	1981-82	1994-95	2000-01	2005-06	1981-82	1994-95	2000-01	2005-06
	to 1993-94	to 1999-00	to 2004-05	to 2011-12	to 1993-94	to 1999-00	to 2004-05	to 2011-12
Andhra Pradesh	3.9	2.8	4.7	5.0	10.0	13.8	9.7	6.5
Arunachal Pradesh	9.3	-0.8	1.6	5.0	9.7	8.5	7.2	7.8
Assam	2.5	0.2	-0.1	4.1	4.8	2.7	1.4	2.2
Bihar	1.1	3.1	7.4	3.3	12.9	22.7	24.1	11.9
Chhattisgarh	4.9	-2.1	4.6	7.3	10.5	10.5	35.3	9.1
Gujarat	8.8	5.2	9.1	5.5	53.5	27.0	24.2	10.4
Haryana	4.5	2.1	2.7	4.2	12.2	7.0	3.5	5.7
Himachal Pradesh	2.8	0.3	8.0	1.5	12.4	2.1	6.2	9.7
Jammu & Kashmir	1.3	5.2	3.6	0.7	11.2	5.7	3.8	2.9
Jharkhand	1.1	4.3	5.0	8.0	12.9	7.2	19.6	5.1
Karnataka	4.5	4.1	-2.9	5.1	8.7	5.7	15.1	6.8
Kerala	3.2	1.9	1.7	-0.2	6.4	4.9	2.4	3.4
Madhya Pradesh	4.9	1.6	2.2	4.4	10.5	3.4	27.1	4.7
Maharashtra	5.7	3.1	1.6	5.3	17.3	10.1	6.9	11.5
Manipur	2.8	2.1	5.8	5.9	3.6	6.2	6.9	4.4
Meghalaya	1.1	7.2	4.8	3.3	11.2	6.2	2.1	2.2
Mizoram			0.1	5.7			4.8	5.9
Nagaland			14.1	2.5			9.7	2.3
Odisha	2.6	0.0	3.5	3.1	18.6	11.0	16.4	2.5
Punjab	4.9	2.5	1.8	1.8	4.6	4.4	2.6	1.6
Rajasthan	5.9	5.5	10.9	5.5	26.5	14.4	44.9	10.1
Sikkim		-1.2	6.5	3.4		11.1	1.0	2.4
Tamilnadu	5.8	1.8	-0.5	4.6	12.7	9.6	14.0	7.0
Tripura	2.5	3.7	4.0	5.7	7.1	5.7	11.4	5.6
Uttar Pradesh	2.8	3.5	1.0	2.8	3.2	5.2	1.8	1.4
Uttarakhand	2.8	2.4	3.3	2.0	3.2	3.5	4.9	4.3
West Bengal	5.3	4.1	2.4	2.6	9.2	4.3	4.0	3.4
Sum of GSDP of:	3.4	2.5	2.1	3.8	5.8	5.2	6.5	2.8
All above states	(3.4)	(3.3)	(1.7)	(3.7)	(5.1)	(4.6)	(6.1)	(2.5)
High irrigation states	3.8	3.2	1.7	2.7	3.1	3.8	2.1	0.9
Medium irrigation states	2.9	1.8	3.1	4.2	9.8	9.1	8.5	3.0
Low irrigation states	3.6	2.8	1.5	4.5	5.6	4.7	9.1	5.3
High productivity states	4.1	2.9	2.5	2.1	3.9	3.1	2.2	0.8
Mid productivity states	3.0	2.4	2.1	3.7	4.0	6.6	4.5	2.3
Low productivity states	3.6	2.6	2.5	5.1	11.0	6.4	16.7	5.4
Across States:								
Median	3.6	2.5	3.5	4.2	10.5	6.2	6.9	5.1
Standard deviation	2.2	2.3	3.7	1.9				

Note: Figures in brackets use corresponding national GDP agriculture and allied (2004-05 prices) data. High irrigation refers to the GSDP sum over Haryana, Punjab, Uttar Pradesh and West Bengal (Net irrigated area (NIA)/Arable land (AL) > 55 per cent in 2008-09). Low irrigation (NIA/AL < 30 per cent) refers to Assam and North-East, Chhattisgarh, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Maharashtra, Rajasthan and Uttarakhand. Medium refers to the rest. High productivity states (present GSDP/AL > ₹70,000/hectare at 2004-05 prices) are Tripura, West Bengal, Kerala, Himachal Pradesh, Punjab, J&K and Haryana. Low productivity (GSDP/AL < ₹35,000) states are Rajasthan, Meghalaya, Madhya Pradesh, Chhattisgarh, Maharashtra, Odisha, Jharkhand, Karnataka and Gujarat. The rest are Middle productivity. The 1980-81 series gives data only for undivided Bihar, MP and UP; these have been split using 1993-94 ratios to get GSDP for new States.

3. The variation in performance across States suggests that State-level responses and implementation play a very significant role in determining agricultural performance. However, to the extent that available technology limits potential growth, it will be difficult to maintain high growth rates where productivity has increased close to potential levels. This is relevant because the Eleventh Plan strategy gave much greater flexibility to States and focused more on yield gaps within existing technology, rather than emphasising new technologies and supporting these. The growth acceleration since 2005 has therefore been much stronger in states with lower productivity and less irrigation. This suggests that the strategy may be correcting the past relative neglect which caused rain-fed farming, covering over 60 per cent of arable land, to perform well below potential.

12.8. It is a matter of concern that the recent growth revival has been weak in areas with high land productivity, not only in relatively more irrigated states such as Punjab, Haryana, Uttar Pradesh and West Bengal that had green revolution success, but also in less irrigated states such as Kerala, Himachal Pradesh and Jammu & Kashmir where high productivity reflects a high-value cropping pattern based on horticulture. These States together contribute about 35 per cent of national agricultural output from 20 per cent of arable land, but none of them have been able to surpass growth rates achieved in the past. Even Gujarat, a low productivity state that sustained near 10 per cent growth for almost a decade through better water use and rapid adoption of Bt cotton hybrids, slowed down perceptibly in the Eleventh Plan as Bt adoption saturated and yields reached a plateau. Clearly, growth is more difficult to accelerate at higher productivity levels without new technology, particularly if past patterns of growth have taken a toll on natural resources.

OUTPUTS, INPUTS AND PRODUCTIVITY

12.9. The Eleventh Plan had made four conscious choices. First, with technology fatigue evident, it funded research better but emphasised on getting more from existing technology. Second, since one size does not fit all, it decentralised plan funds to

encourage initiatives at State and lower levels. Third, aware of low public investment and food security needs, it increased Centre's spending on these, particularly in disadvantaged regions. Fourth, noting farmer distress, it tried to focus not just on production but also on farm incomes, stressing service delivery and suggesting encouragement of group activity with land and tenancy reforms put back on the agenda. Compared to the original green revolution that built on the best, this strategy sought to deliver faster growth, that is, more inclusive, more stable and less concentrated spatially. Nonetheless, there is a wide demand for a 'second green revolution' with more irrigation and better crop-specific technologies, with some even claiming that Bt cotton has been the only recent success. The Twelfth Plan accepts the proposition that a greater technical thrust is needed, and the strategy for agriculture should take this into account

12.10. In order to provide a snapshot of the Eleventh Plan performance and give indication of what the Twelfth Plan should do differently, long-run data on growth of output by sub-sector and also rates of growth of input use and productivity are presented in Table 12.4. Since performance is almost invariably discussed in the context of well-defined policy periods, those chosen for this table are same as in the Eleventh Plan document: (i) Pre-Green Revolution (1951–52 to 1967–68); (ii) Green Revolution proper (1968–69 to 1980–81); (iii) Wider technology coverage (1981–82 to 1990–91) when focus shifted from intensification of Green Revolution in best areas to its spread to new areas; (iv) Early liberalisation period (1991–92 to 1996–97) when relative prices became an additional focus, both because agriculture was expected to gain from reduced trade protection to industry and also with Minimum Support Prices (MSP) used for active growth promotion rather than just passive price support. The other three periods in the table are subsequent Plan periods: (v) Ninth Plan (1997–98 to 2001–02); (vi) Tenth Plan (2002–03 to 2006–07) and (vii) Eleventh Plan (2007–08 to 2011–12). For each of these periods, the average of annual growth rates is presented for each variable chosen.

12.11. As noted above, growth of agricultural GDP at 3.3 per cent was short of the 4 per cent target for

TABLE 12.4
Growth of Output, Inputs and Productivity

(period averages of annual growth rates)

	Pre-Green Revolution	Green Revolution	Wider Coverage	Early Liberalisation	Ninth Plan	Tenth Plan	Eleventh Plan
	1951/52 to 1967/68	1968/69 to 1980/81	1981/82 to 1990/91	1991/92 to 1996/97	1997/98 to 2001/02	2002/03 to 2006/07	2007/08 to 2011/12
I. Value of Output (2004–05 prices)							
Cereals	4.2	3.4	3.5	2.4	1.5	1.0	3.0
Pulses	3.0	0.7	3.4	0.8	0.3	1.8	4.2
Oilseeds	3.2	1.8	7.4	4.4	-2.5	7.4	4.5
Sugars	3.3	4.1	4.2	2.4	9.4	1.7	2.2
Fibres	4.4	2.5	5.3	6.5	-5.6	15.1	10.7
Non-horticulture crops	3.2	2.7	3.0	2.1	1.7	2.1	2.8
Horticulture	2.6	4.2	3.1	5.7	3.8	2.6	4.7
All Crops	3.0	3.0	3.0	3.1	2.3	2.1	3.4
Livestock	1.0	3.3	4.8	4.0	3.6	3.6	4.8
Crops and Livestock	2.5	3.0	3.3	3.3	2.6	2.5	3.8
Fishing	4.7	3.1	5.7	7.1	2.7	3.3	3.6
Forestry	1.7	-0.2	0.3	0.3	2.7	1.3	2.3
Agriculture and allied	2.3	2.4	3.0	3.1	2.6	2.4	3.6
II. Value of Intermediate Inputs (2004–05 prices)							
Seed	1.5	1.1	2.3	1.6	-0.6	1.4	4.1
Feed of livestock	1.9	4.0	0.1	0.9	3.9	0.7	3.3
Organic manure	0.0	1.3	0.7	0.5	1.6	2.9	3.3
Fertilisers and pesticides	18.2	9.3	8.7	2.0	3.9	4.8	6.7
Diesel oil	26.0	13.1	8.7	4.3	5.1	5.1	5.8
Electricity	18.5	15.2	12.9	14.4	-4.1	2.6	8.0
All inputs crops and livestock	2.4	4.5	2.2	1.9	3.0	2.5	4.4
Inputs for fishing	4.6	3.3	5.4	6.5	2.7	1.5	3.5
Inputs for forestry	1.7	-0.2	0.1	0.3	2.6	1.3	2.3
All inputs Agriculture and allied	2.3	3.9	2.1	1.9	3.0	2.4	4.3
III. Gross Value Added (2004–05 prices)							
Crops and Livestock	2.7	2.7	3.7	3.7	2.5	2.5	3.5
Fishing	4.7	3.0	5.8	7.2	2.7	3.6	3.7
Forestry	1.7	-0.2	0.4	0.3	2.8	1.3	2.3
Agriculture and allied	2.5	2.4	3.5	3.7	2.5	2.4	3.3
IV. Factor Inputs into Agriculture							
Land (Gross cropped area)	1.3	0.4	0.8	0.3	-0.1	0.6	0.3
Labour	1.8	1.1	0.5	2.3	0.3	0.5	-1.5
Net Fixed Capital Stock	2.3	3.6	2.8	3.1	3.4	4.7	6.0
Of which: Public			3.9	2.0	1.4	2.3	3.6
Private			1.4	4.3	5.1	6.6	7.5
V. Partial Factor Productivities (2004–05 prices)							
Land productivity	1.2	2.0	2.7	3.3	2.6	1.8	3.1
Labour productivity	0.7	1.4	3.0	1.4	2.2	1.8	4.8
Capital productivity	0.2	-1.1	0.7	0.6	-0.9	-2.4	-2.7

Note: Cropped Area from Ministry of Agriculture, Land use statistics; Labour is agricultural employment from Census till 1971 and NSSO (weekly status) from 1972–73; all other data are from Central Statistical Organisation (CSO): National Accounts 2004–05 prices.

agricultural GDP but was faster than that in the Tenth or the Ninth Plan, though lower than the period from 1981–82 to 1996–97. The growth rates for individual crops shown in Table 12.4 are for gross value of output and not value added, but they present a valid basis for inter-period comparisons.

1. Growth of total value of output in agriculture proper (crops and livestock) during the Eleventh Plan averaged 3.8 per cent per year which was the highest among all seven periods considered.
2. Total non-horticulture crop output grew marginally faster than target (2.8 per cent against 2.7 per cent target) mainly because of foodgrains (3.1 per cent actual against 2.3 per cent target), oilseeds (4.5 per cent against 4 per cent) and fibres (10.7 per cent against 5 per cent).
3. Horticulture at 4.7 per cent was only marginally short of the 5 per cent target.
4. Growth of output from livestock (4.8 per cent) was again highest amongst all the periods considered but this performance, and even more, so for fishing (3.6 per cent), fell short of the ambitious 6 per cent target set for these two sub-sectors.
5. Growth of forestry was expectedly slower, pulling down the growth of total value of output in agriculture and allied to 3.6 per cent, but this too was the highest among all the seven periods considered.

12.12. Growth in intermediate inputs has accelerated steadily reaching 4.3 per cent per annum during the Eleventh Plan, which was much higher than growth of output and over twice the growth rate of intermediate input use during 1981–97. The more rapid growth in input use explains why despite the faster growth of the gross value of output during the Eleventh Plan at 3.6 per cent than in the period 1981–82 to 1996–97 (about 3.0 per cent), GDP in agriculture (which is a value added concept) grew more slowly. In other words, agricultural growth became more input intensive in the Eleventh Plan. This suggests the need to re-look policies relating to inputs, especially fertiliser and power.

12.13. Policies towards input use need to distinguish between traditional inputs such as seed, feed and

organic manure and modern inputs such as chemical fertiliser, pesticides and farm power. With low seed replacement, underfed farm animals and soils short of organic carbon, projections by working groups for the Twelfth Plan suggest that past growth of these traditional inputs should be improved upon. However, these working groups also project lower growth of ‘modern’ inputs than observed during the Eleventh Plan. For example, 2016–17 requirements of chemical fertiliser and farm power are placed at levels that imply annual growth for both fertilisers and ‘modern’ energy at about 4.5 per cent. These exceed corresponding the Eleventh Plan projections but are much less than the Eleventh Plan actual. Reduced fertiliser and fuel subsidies would be consistent with the desired moderation in trend of these inputs. Restraint is also needed on pesticides use which rose sharply in the Eleventh Plan after years of being subdued.

12.14. In parallel with high growth of intermediate inputs, there was acceleration in growth of the net capital stock in agriculture and allied sectors during the Eleventh Plan. As shown in Table 12.4 (item IV), Net Fixed Capital Stock in agriculture expanded at 6.0 per cent per year, much faster than in the previous two Plans. The public component of capital stock increased by 3.6 per cent while the private component increased at 7.5 per cent per year, both showing acceleration compared to the previous two Plans. However, public investment in agriculture, which was stepped up very substantially in the last three years of the Tenth Plan, stagnated in the Eleventh Plan (Table 12.5). This was mainly because of a large shortfall in planned investment in irrigation. As a result a key part of the Eleventh Plan strategy to achieve 4 per cent agricultural growth which was to increase public investment in agriculture to 4 per cent of agricultural GDP and thereby achieve growth of public sector capital stock in agriculture at least equal to the required 4 per cent growth of total capital stock has not fructified. Clearly, to attain 4 per cent agricultural growth in the Twelfth Plan will require firmer commitment to ensure realisation of this unattained the Eleventh Plan objective.

12.15. Private investment in agriculture has accelerated over the past three Plans. Private investment

TABLE 12.5
Gross Capital Formation (GCF) in Agriculture, Forestry and Fishing (2004–05 prices)

Year	GDP from Agriculture and Allied 2004–05 Prices	GCF in Agriculture and Allied at 2004–05 Prices			GCF in Agriculture as Per Cent of GDP from Agriculture		
		Public Sector	Private Sector	Total	Public Sector	Private Sector	Total
1	2	3	4	5	6	7	8
Tenth Plan							
2002–03	5,17,559	10,299	63,215	73,514	2.0	12.2	14.2
2003–04	5,64,391	12,683	57,238	69,921	2.3	10.1	12.4
2004–05	5,65,426	16,187	59,909	76,096	2.9	10.6	13.4
2005–06	5,94,487	19,940	66,664	86,604	3.5	11.2	14.6
2006–07	6,19,190	22,987	69,070	92,057	3.7	11.2	14.9
Eleventh Plan							
2007–08	6,55,080	23,257	82,484	1,05,741	3.6	12.6	16.1
2008–09	6,55,689	20,572	1,06,555	1,27,127	3.1	16.3	19.4
2009–10	6,62,509	22,719	1,08,420	1,31,139	3.4	16.4	19.8
2010–11	7,09,103	21,500	1,20,754	1,42,254	3.0	17.0	20.1

Source: Central Statistical Organisation National Accounts Division.

averaged 15.6 per cent of agricultural GDP in the first four years of the Eleventh Plan as against expected 12 per cent. The main driver of this was a large relative price shift in favour of agriculture, showing that farmers respond to price incentives. If calculated in current price terms rather than constant, private investment averaged 13 per cent of agricultural GDP—only slightly higher than expected. Nonetheless, total capital stock in agriculture grew more than expected. While private investment in irrigation and water-saving devices did increase, the largest increase was in labour-saving mechanisation. This was a natural response to growing labour scarcity which is reflected in rising wages.

12.16. Table 12.4 also shows growth rates of the two other factors of production in agriculture: land and labour. Not unexpectedly, while capital stock has grown quite rapidly throughout, the other two factors have not. As far as labour is concerned, the measure shown is employment in agriculture by usual status estimates of the National Sample Survey (NSS), which is available almost annually since 1987–88 but requires interpolation for earlier years. Combined with Census data, these show continuous increase of

agricultural employment till 1994, although at varying rates of growth and at a particularly sharp rise in early 1990s when there was slow-down in rural non-agricultural employment. Agricultural employment fluctuated in the next decade, but has clearly declined after 2004–05. NSS employment data for 2007–08 and 2009–10 show clear evidence of an accelerated shift of rural labourers to non-agricultural work, which in itself is not an undesirable development. For land, the measure shown is gross cropped area which, despite the loss of nearly 3 million hectares of arable land to non-agricultural uses since 1990–91, has increased in all periods excepting a slight dip in the Ninth Plan. This is because cropping intensity has increased almost continuously. However, cropped area growth which averaged 0.9 per cent per annum till 1990–91 has averaged only 0.2 per cent subsequently.

12.17. Table 12.4 also shows growth rates of partial productivity of land, labour and capital taking GDP agriculture and allied as numerator. Labour productivity growth has historically been low, averaging 2 per cent per annum or less except during 1981–90 when it reached 3 per cent. Labour productivity

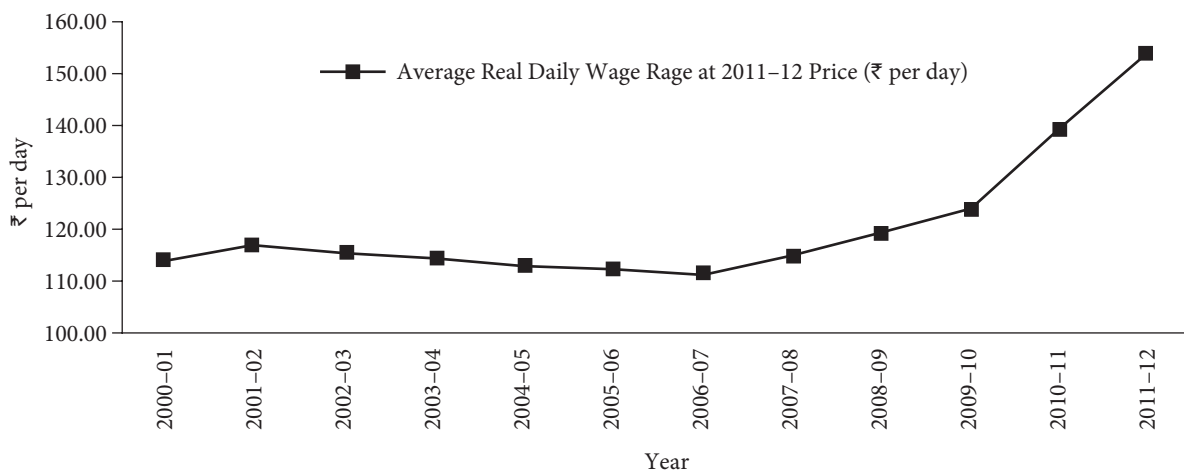


FIGURE 12.2: All India Average Real Daily Wage Rate at 2011-12 Prices (₹ Per Day)

jumped to nearly 5 per cent during the Eleventh Plan. The accelerated shift of rural labour to non-agriculture caused real wages to rise at about 5 per cent annually between 2004-05 and 2009-10, according to the NSS, and latest reports of the Commission of Agricultural Costs and Prices (CACP) suggest even faster growth of real wages in the last three years of the Eleventh Plan at almost 8 per cent per year. The trend in real wages in 2011-12 prices, as estimated by CACP, is shown in Figure 12.2.

12.18. Labour saving mechanisation, a significant contributor to the sharp increase of private investment in the Eleventh Plan period, was a natural response to tighter labour markets and rising wages. But, while mechanisation helped farmers to cope with labour scarcity, it exacerbated a decline in capital productivity. Private capital stock in agriculture has increased twice as fast as agricultural GDP since the Ninth Plan and, although mitigated by terms of trade gains and a debt write-off, continued investment with declining capital productivity may not be sustainable.

12.19. While greater private investment in farming is desirable where it reflects both an ability to invest and a desire to increase farm productivity, the same phenomenon can become a source of distress if farmers keep investing to cope with shrinking natural resources, more frequent adverse weather and less assured labour supply, and do not get adequate

returns for this investment. The Eleventh Plan had tried to address this in two ways: first, increase public investment to lessen the private burden and add economies of scale; and second, rework architecture of the Plan spending on agriculture to make it more decentralised and flexible but also more coordinated locally to improve total productivity of private resources by better service delivery in all areas from extension to input supply and marketing. However, as noted earlier, public investment did not increase. And, although combined Plan expenditure of Centre and States in agriculture did increase from 1.9 per cent of agricultural GDP in the Tenth Plan to 2.9 per cent in the Eleventh, this was relatively small and left research, education and extension under-funded, leaving much to be desired in the quality of service delivery.

12.20. Nonetheless, growth of land productivity did increase significantly (Tables 12.4 and 12.6). Having climbed from about 1 per cent per annum before Green Revolution to over 3 per cent during 1991-97, land productivity growth had decelerated to below 2 per cent. This rebounded to over 3 per cent during the Eleventh Plan.

12.21. Total factor productivity (TFP) improved during the Eleventh Plan. Individual factor productivity data in Table 12.4, weighted by a range of factor shares suggest that TFP growth during the Eleventh Plan was back to around 1980s level. For example,

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applying factor shares of 30 per cent land, 40 per cent labour and 30 per cent capital give the following averages of annual TFP growth: 0.7 per cent in pre-Green Revolution period, 0.8 per cent during Green Revolution period, 2.2 per cent during the wider coverage period, 1.8 per cent during early liberalisation, 1.4 per cent during the Ninth Plan, 0.6 per cent during the Tenth Plan and 2.0 per cent in the Eleventh Plan. Although these estimates must be treated as tentative since data on factor shares is not robust, it does suggest that the deceleration of TFP in agriculture observed in the previous two Plans, which had caused widespread apprehension, may have been reversed in the Eleventh Plan. In other words, the Eleventh Plan architecture, with the Rashtriya Krishi Vikas Yojana (RKVY) as core, appears to have delivered despite adverse weather, a public investment shortfall and implementation gaps. The strategy of spreading known technology wider had paid.

SUB-SECTOR-WISE PERFORMANCE AND ISSUES

Crop Sector

12.22. In addition to above, two indicators worth highlighting in the crop sector are the pace and pattern of crop area diversification and trends in yields/

hectare of important individual crops. There has been gradual but sustained shift in cropping pattern away from coarse cereals and pulses towards other crops over the last four decades. Area under coarse cereals had declined by 18 million hectares and that under pulses by nearly 2 million hectares from earlier peaks to end of the Tenth Plan. During the Eleventh Plan, there was further decline of 2 million hectares in area under coarse cereals but area under pulses reversed earlier decline to reach a new peak in 2010–11. Noting, that technology and price policy had neglected pulses earlier despite their importance as source of protein, special attention was given to pulses in both the National Food Security Mission (NFSM) and RKVY, the two major schemes launched during the Eleventh Plan. Cotton gained most area, followed by fruits and vegetables, with rice area steady, an increase in wheat area and decline in area under oilseeds and sugarcane.

12.23. Although area under coarse cereals and oilseeds declined during the Eleventh Plan, both these crop groups averaged over 4 per cent output growth. This was because growth of yields per hectare accelerated across almost all crop groups, especially those mainly rain-fed (Table 12.6). Not only did coarse cereals and oilseeds yields increase faster during the

TABLE 12.6
Average Annual Growth Rates in Yields Per Hectare

	Pre-Green Revolution	Green Revolution	Wider Coverage	Early Liberalisation	Ninth Plan	Tenth Plan	Eleventh Plan
	1951/52 to 1967/68	1968/69 to 1980/81	1981/82 to 1990/91	1991/92 to 1996/97	1997/98 to 2001/02	2002/03 to 2006/07	2007/08 to 2011/12
Wheat	3.7	3.3	3.6	2.8	0.7	-0.3	3.0
Rice	3.2	2.7	3.0	1.4	2.1	1.2	2.2
Jowar	3.4	2.9	3.2	1.3	0.2	2.1	3.1
Bajra	2.6	6.3	8.8	6.2	4.9	7.3	8.4
Maize	4.8	1.7	4.1	2.6	3.1	-0.2	6.5
Coarse cereals	2.6	1.5	3.1	4.3	1.3	1.7	7.3
Pulses	2.3	-0.2	2.3	1.9	-0.3	0.6	2.7
Oilseeds	1.3	0.8	4.8	3.3	0.4	3.5	5.4
Cotton	3.0	2.6	5.3	3.1	-6.2	19.4	3.9
Sugarcane	1.6	3.1	1.3	0.4	0.3	0.7	0.5

Note: Data is up to fourth advance estimate for 2011–12, Ministry of Agriculture.

Eleventh Plan than in any of the earlier periods, so did pulses yields. Apart from hybrids in case of maize, and to less extent in bajra, these yield increases came mainly from better seed quality, higher seed replacement and better practice rather than from new crop technology or more irrigation.

12.24. Yield growth of cotton, another largely rain-fed crop, was also respectable although it was down sharply from a spectacular performance during the Tenth Plan following adoption of Bt hybrids. With more than 90 per cent of cotton area now under Bt hybrids, and cotton yields more than doubling over the last decade, there is no doubt either about general farmer acceptance or its being a clear case of technological transformation unlike other rain-fed crops. But disagreements continue about the extent to which Bt contributed to this yield increase and on wisdom of India's total dependence on Bt hybrids rather than the Bt varieties used in the rest of the world. There are also legitimate complaints of non-availability of non-Bt seeds, for example in Vidharbha. Genetically modified organisms (GMOs) therefore remain controversial, as was evident in case of Bt Brinjal. Nonetheless, since significant breakthroughs in production technologies are required to cope with increasing stress, particularly for rain-fed crops, it is necessary to remain abreast with latest advances in biotechnology. It is, therefore, time to put in place scientifically impeccable operational protocols and a regulatory mechanism to permit GMOs when they meet rigorous tests that can outweigh misgivings, while simultaneously noting that many feasible advances in biotechnology do not in fact involve GMOs.

12.25. Moreover, the Eleventh Plan experience is that continuous less-visible efforts by farmers to adapt and improve can be made effective. The NFSM, which aimed to reduce gaps between potential and actual yields, was designed to aid farmers in their own efforts by demonstrating and supporting a wide range of interventions. This seems to have worked. For example, growth in wheat yields nationally was negligible during the Ninth and the Tenth Plans but increased to 3 per cent in the Eleventh Plan. Even in Punjab, where it was believed that wheat yields

had reached a plateau below 4.5 tonnes per hectare, yields increased steadily during the Eleventh Plan to reach 4.9 tonnes, accompanied by wider use of conservation practices such as laser levelling, zero tillage and raised beds. Rice yield growth was also higher in the Eleventh Plan than in any period after 1991, with Assam, Bihar, Chhattisgarh, East Uttar Pradesh and West Bengal contributing 80 per cent of this, again with growing awareness of conservation practices. For example, many States are now using RKVY to mainstream the System of Rice Intensification (SRI) that was not officially accepted till 2004 and was only small part of NFSM.

Livestock and Fishery

12.26. Livestock contributes 25 per cent of gross value added in the agriculture sector and provides self-employment to about 21 million people. Rapid growth of this sector can be even more egalitarian and inclusive than growth of the crop sector because those engaged in it are mainly small holders and the landless. Growth of livestock output averaged 4.8 per cent per annum during the Eleventh Plan recovering from an average of 3.6 per cent in the Ninth and the Tenth Plans.

12.27. Growth, of dairying, which is the main constituent of livestock sector though slightly higher than the 4 per cent averaged since 1990, was short of demand. With over 75 per cent of cattle located in rain-fed areas, the major issue is access to feed, fodder and drinking water which is becoming increasingly scarce. The problems of the sector are compounded by growing numbers of unproductive male cattle. Developing a strong fodder base needs intensive effort and innovation in institutional aspects of pasture protection and management and usufruct sharing. There is little concerted effort in this area at present as it is too fragmented across various departments to be able to provide the technical inputs, institutional designs and adequate investments to make a meaningful impact. Richer farmers with access to groundwater irrigation can grow irrigated fodder and increase herd size. Poorer livestock owners, dependent mainly on commons and agriculture residues, end up underfeeding the animals. This problem raises questions about the present breeding strategy

that focuses almost exclusively on induction of breeds that are high yielding, but are much less tolerant to adverse conditions in extensive livestock systems.

12.28. These issues, which also affect owners of small ruminants, poultry and even those involved in inland fishery, came to the fore during the Eleventh Plan following the drought of 2009. The consequent high inflation in feed and fodder, that also led to high inflation in prices of livestock products, revealed a need for much greater coordination not only between agencies responsible for livestock and those responsible for crops that sustain livestock, but also with other policies, for example, trade policies that influence feed and livestock product prices. RKVY provided a window which cut across departments to allow States to focus on fodder shortages and restored growth of livestock output much quicker than in earlier droughts. Nonetheless, underlying problems remain, as does so called protein inflation. The Twelfth Plan must address these problems by involving dairy cooperatives in breed and feed issues, revisit breeding strategies and make fodder development higher priority in both animal husbandry and crop programmes.

12.29. India produces about 65 billion eggs annually and production growth has accelerated from around 4 per cent per annum during the 1990s to over 5 per cent during the Tenth and the Eleventh Plan. This acceleration has been achieved despite new challenges such as periodic outbreaks of avian influenza and the biofuels effect on international prices of maize, the main poultry feed, which has now transmit into the domestic economy. One reason for this vitality has been the growth of a large and vibrant commercial poultry sector with adequate economies of scale and fairly good backward and forward linkages. Besides eggs, this commercial poultry sector also produces over 2 million tonnes of broiler meat which is an increasing part of total meat production of about 5 million tonnes. Meat, with production growth at over 5.5 per cent per annum during the Eleventh Plan, is the fastest growing segment in the livestock sector.

12.30. The performance of the fisheries sub-sector has been impressive on the whole, with growth

more than 5 per cent per annum during the 1980s and 1990s, but growth in this sub-sector has been decelerating since mid-1990s. The main reason for this has been stagnation of marine fishery, a phenomenon which is expected to continue. The major growth in fisheries in recent years has come from the inland fisheries, with particularly rapid development of brackish water aquaculture. This has been linked to prawn cultivation for export, although there is also strongly growing domestic demand for fresh water fish. Fish prices more than doubled during the Eleventh Plan, a higher inflation than either crops or any other livestock segment, despite a small acceleration in production growth compared to the Tenth Plan. A problem in this sector is that although a National Fisheries Development Board was set up, responsibilities are still not clearly defined between this and the Department of Animal Husbandry, Dairying and Fisheries. This has in particular meant an inability to realise the vast potential of inland fresh water fishery. Fish production can be enhanced 2 to 4 times in rain-fed water bodies, whether irrigation reservoirs, natural wetlands or ponds and tanks created by watershed development or Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). If fully harnessed, these can secure over 6 per cent fishery growth in the Twelfth Plan.

EMERGING IMBALANCES

12.31. Although the discussion so far suggests that agricultural performance did improve during the Eleventh Plan, experience of the Eleventh Plan also points to emerging imbalances in agriculture which call for a long-term strategic reorientation.

Subsidies vs Public Investment

12.32. The Eleventh Plan document had highlighted that public investment in agriculture as per cent of agricultural GDP had halved between the 1980s and in the end of the Ninth Plan while, simultaneously, budgetary subsidies to agriculture had doubled as proportion of agricultural GDP. The tendency for subsidies to increase much faster than public investment was checked to some extent during the Tenth Plan, but it reappeared again during the Eleventh Plan (Table 12.7). Budgetary subsidies to agriculture (excluding food subsidy, which should be treated as

a consumer subsidy) increased from an average of 4.1 per cent of agricultural GDP during the Tenth Plan to average 8.2 per cent in the first four years of the Eleventh Plan. Actual subsidies to agriculture were higher in both periods since CSO books budgeted subsidy on domestic urea manufacture entirely to industry and because part of the power subsidy received by agriculture is not budgeted but borne by utilities. Compared to these numbers, public investment in agriculture averaged only about 3 per cent of agricultural GDP during both Plan periods.

12.33. The imbalance between subsidy expenditure and expenditure on public investment raises the issue whether a shift away from subsidies and towards greater public investment would not be beneficial. The usual argument for reducing subsidies is that it will improve the fiscal deficit, but that is not the relevant point in this context, there is a need to shift from subsidies to public investment aimed at increasing land productivity on the grounds that

this would produce better agricultural outcomes and would also be more inclusive. This is particularly important in the context of strategies for combating the effect of climate change where public investment in conservation and management of water resources will be crucial.

12.34. There are also other uses of resources in agriculture which could be promoted if agricultural subsidies are restrained. The Eleventh Plan document had pointed to trade-offs that subsidies might have with other non-Plan revenue expenditures, particularly staffing of essential farm support systems such as extension. Moreover, capacity and skill shortages have made upgrading agricultural universities an urgent need. The Eleventh Plan had aimed to increase spending on agricultural education and research from 0.6 to 1 per cent of agricultural GDP, but this remains less than 0.7 per cent—a large gap in a very important area that is miniscule in relation to subsidies.

TABLE 12.7
Public Sector Capital Formation and Subsidies to Agriculture (Centre and States)

(in ₹ crore and as per cent to GDP from agriculture and allied at current prices)

	Public GCF Agriculture and Allied		Budgetary Subsidies (CSO)		Food Subsidy	Total Fertiliser Subsidy	Subsidy on Indigenous Urea	All other Agriculture Subsidies				
Tenth Plan												
2002–03	9,563	2.0	43,597	9.0	24,176	5.0	11,015	2.3	7,790	1.6	16,196	3.3
2003–04	12,218	2.2	43,765	8.0	25,181	4.6	11,847	2.2	8,521	1.6	15,258	2.8
2004–05	16,187	2.9	47,655	8.4	25,798	4.6	15,879	2.8	10,243	1.8	16,221	2.9
2005–06	20,739	3.3	51,065	8.0	23,077	3.6	18,460	2.9	10,653	1.7	20,181	3.2
2006–07	25,606	3.5	59,510	8.2	24,014	3.3	26,222	3.6	12,650	1.7	21,924	3.0
Eleventh Plan												
2007–08	27,638	3.3	85,698	10.2	31,328	3.7	32,490	3.9	12,950	1.5	34,830	4.2
2008–09	26,692	2.8	1,56,823	16.6	43,751	4.6	76,603	8.1	17,969	1.9	54,438	5.8
2009–10	33,237	3.1	1,39,248	12.9	58,443	5.4	61,264	5.7	17,580	1.6	37,121	3.4
2010–11	34,548	2.7	1,50,170	11.8	63,844	5.0	62,301	4.9	15,081	1.2	39,106	3.1

Note: Public sector agricultural GCF and GDP are from CSO, National Accounts Division; budgetary subsidies, are also from CSO and are based on the economic and purpose classification of Government expenditure. Food and Fertiliser subsidies are from budget documents of the Central Government. ‘All other agriculture subsidies’ in the table are defined as budgetary subsidies (CSO) *plus* subsidy on indigenous urea *minus* food subsidy. This is because CSO classifies food subsidy as subsidy to agriculture but classifies subsidies on indigenous urea as subsidy to industry.

12.35. Another, very important reason why subsidies should be rationalised and restrained is that some of these subsidies could actually be doing harm. A case for subsidies exists if there is clear evidence that some input is being underused. Conversely, when with there is clear evidence of overuse of a subsidised input, there is a case to reduce or even eliminate the subsidy. Today, there is clear evidence of overuse. Data from all over India, especially from the prime green revolution areas, show that high use of chemical fertilisers and power is causing excessive mining of other soil nutrients and of groundwater, and that this is also leading to loss of quality of both soil and water. There is of course about 20–25 per cent of the country's arable area, located largely in North-East, East and Central India, where use of these inputs is so low that further intensification is desirable *per se*. But with nearly 90 per cent of fertilisers and 95 per cent of farm electricity currently being used outside this area, there can be no doubt that the present subsidies are actually encouraging practices that need to be discouraged.

12.36. Any proposal for reducing subsidies will be opposed by farmers on the grounds that output will fall if the subsidy cut reduces input use. This is true unless other investments are made simultaneously but such investments would indeed be facilitated by the resources released. Efforts were made in the Eleventh Plan to encourage more efficient practices without actually reducing the quantum of subsidy. For example, many States have undertaken separation of feeders so that electricity supply for agricultural use can be treated differently from that for rural non-agricultural use, and stricter scheduling imposed on the former while maintaining its lower price. Similarly, the Centre introduced a new scheme, the 'National Project on Management of Soil Health & Fertility' (NPMSH&F) to promote soil testing and issue of soil health cards to farmers, aimed particularly to spread awareness of micronutrient deficiencies resulting from excessive and unbalanced fertiliser use and to encourage balanced and judicious use of chemical fertilisers in conjunction with organic manures to maintain soil health and fertility. Moreover, in order to rationalise fertiliser subsidies, a nutrient-based subsidy (NBS) system was adopted

to subsidise fertiliser products uniformly on basis of nutrient content, rather than set product-wise subsidies and separate maximum retail prices (MRPs) for each product. The objective was to reduce dead-weight of the fertiliser control order, set nutrient-specific subsidies that maintain desirable NPK balance, and evolve a subsidy protocol to encourage both development of new complex fertiliser products (including micronutrients) and more investment in the sector.

12.37. These initiatives have had some success in particular regions, but they do not as yet show up in national data in terms of higher additional output per unit additional use of these inputs. Moreover, NBS roll-out was seriously flawed since urea was kept out of its ambit. Urea prices remain controlled with only a 10 per cent rise at the time of adoption of the NBS in 2010. Meanwhile prices of decontrolled products doubled. The fixity of the urea price naturally worsened the NPK balance. Also, there has been very little product innovation. The subsidy bill has increased because resulting higher urea demand has been met entirely by imports at a unit subsidy twice that on domestic output, with little incentive to expand domestic capacity. The NBS as rolled out has been counterproductive because urea has not been included.

12.38. As may be seen from Table 12.6, the fertiliser subsidy is now much higher than all other subsidies to agriculture put together. While this is partly because fertiliser consumption rose over 30 per cent during the Eleventh Plan, the main reason is that world prices of all fertilisers and feedstock have doubled since 2006. With world fertiliser prices very sensitive to demand from India, which is not only the world's largest importer of fertilisers but also dependent almost entirely on imports for feedstock, improving efficiency of fertiliser use must be a the Twelfth Plan focus, almost as important as the issue of water use efficiency taken up in another chapter.

A New Road Map for Fertiliser Policy

12.39. A broad idea of what is necessary is evident from a few key indicators about the price of urea, the most important and politically sensitive fertiliser

in India. At the world level, urea prices had averaged about 80 per cent of world wheat price during the 25 years before 2005. Since then, they have been fluctuating wildly at much higher levels and world urea prices are now over 150 per cent of world wheat price. In comparison, the price of urea in India has been declining continuously in relation to wheat MSP—from over 150 per cent during the 1980s, to 75 per cent in 2005, to only 41 per cent currently. While MSP of wheat for 2012 was 90 per cent of April–June average of world reference price of wheat, the MRP for urea was only 21 per cent of world reference price of urea.

12.40. Similarly, achieving the recommended national 4:2:1 NPK balance has proved elusive, again partly because urea (main source of N) is priced cheap relative to other fertilisers. World prices of DAP (main source of P) and MOP (main source of K) have fluctuated around 150 per cent and 100 per cent of world urea price over the last 30 years with no obvious trend. Relative prices of P to N were similar in India as globally, and K much cheaper, till decontrol in 1992 made these more expensive. The MRP for DAP and MOP in India were 194 per cent and 92 per cent of urea MRP before NBS, after which these have risen sharply again. Voluntary MRP for these are now 380 per cent and 230 per cent of urea MRP. Unless corrected soon, this large distortion in NPK prices is bound to reduce crop productivity.

12.41. One way out of the present conundrum is to bring urea into NBS and decontrol its prices. But this has not been possible so far and fertiliser decontrol both in 1992 and again in 2010 excluded urea with counterproductive effect. The reason for this is not just opposition to rise in urea prices, but also issues related to domestic urea industry. For example, subsidy provided to N for decontrolled fertilisers in the present NBS formula is based on the weighted average of subsidies on imported (around \$320/tonne) and indigenous (around \$160/tonne) urea. Three consequences would follow if urea prices were decontrolled fully with the subsidy on both imported and domestic urea equated to this (around \$200/tonne). First, the domestic urea industry as a whole would get a windfall gain, and there may

be consequent audit objections, since average unit subsidy on domestic urea is presently half that on imported. Second, notwithstanding this, that part of urea industry which uses feedstock other than gas would complain that they could become unviable since their present subsidy is more than the weighted subsidy. Third, since post-subsidy price of urea would tend to settle at import cost less the weighted subsidy; this would, with world urea prices now about \$420/tonne, not only double from the present MRP of ₹5,310 per tonne but also be subject to the very large fluctuations in world urea prices that have been evident since 2005.

12.42. Although political opposition to decontrol is mainly on the third point above, the other points, which relate to differences in costs of production between different Indian producers and between Indian costs and world prices, have historically been at least equally important impediments to reform in this sector. This is unfortunate since India's fertiliser industry, although at disadvantage on feedstock, is largely efficient and can play a key role both in ensuring future nutrient supply and in the effort to increase fertiliser-use efficiency. However, with more than half of its revenues coming from subsidies and with Government also allocating scarce feedstock cheaply, industry effort currently is more to meet pre-set requirements and lobby, rather than to either secure long-term feedstock sources or develop new products and services for its customer base. This needs to change, and one way that this can be done is by reducing industry's dependence on Central subsidies, allowing greater space for it to set prices. The industry's present cost structure is such that no subsidy would be required on over 70 per cent of domestic urea production if urea MRP was allowed to rise to MSP for wheat or paddy. This level of urea MRP would reduce subsidy by about ₹15,000 crore annually and bring domestic NPK price parities in line with corresponding world parities while still leaving absolute fertiliser prices in India at about half international levels.

12.43. Of course, if this were all, urea prices would more than double with all its negative consequences. It would be politically unpopular even with the

5–10 per cent extra increase in MSP that would be required to compensate increases in cost of production. There would definitely be some loss of output as result of lower urea use and farmers unable to avail MSP increase would suffer loss of income. But these negatives can be neutralised and a win-win outcome ensured if the saving in subsidy is ploughed back to develop suitable location and crop-specific packages with adequate price incentives so that farmers do not suffer income loss and yet are encouraged to use appropriate combinations not only of NPK but also organic matter and required micronutrients.

12.44. However, for this, the architecture for public intervention will need to go well beyond NBS. Designing and contracting suitable packages will require stability in prices of basic NPK in relation to crop MSPs and also considerable location-specific input, both scientific and operational. The Centre will need to ensure some insulation of domestic prices of straight fertilisers from their large world price fluctuations and devolve many functions and most of the savings from reduced urea subsidy to States. States, in turn, will need to involve universities and local bodies to design suitable local packages of products and subsidies and then contract directly with industry.

Cereals Production and Build up of Stocks

12.45. Another major imbalance that emerged during the Eleventh Plan was between production and consumption of cereals, particularly rice and wheat on the one hand which led to rising stocks and rising consumption of edible oils and pulses which led to imports. Cereals production increased by 37 million tonnes (8 million tonnes coarse cereals, 11 million tonnes rice and 18 million tonnes wheat) between 2006–07 and 2011–12. This was the result of several factors, including the NFSM, an Eleventh Plan initiative to increase production, combined with remunerative prices and an expanding and effective procurement machinery in Madhya Pradesh for wheat and Chhattisgarh for paddy. However, although NFSM exceeded targets and per capita production has bounced back beyond earlier highs, much of the increase has been absorbed by increase in Government stocks. There are lessons that need to be learnt from this for the Twelfth Plan.

12.46. The rapid accretion of stocks between 2006–07 and 2008–09 was because cereals output responded quickly to policy, both NFSM and MSP, rising from 203 million tonnes in 2006–07 to 220 million tonnes, accompanied by even larger increase in procurement, from 36 million tonnes to 59 million tonnes, while off-take from public stocks rose only from 37 to 39 million tonnes. Consequently, market availability declined during this period, increasing grain prices, the dominant source of food inflation till 2009–10 (Table 12.8). Availability contracted further in 2009–10 because of drought which caused output to fall back to 203 million tonnes. Rice and wheat relative prices eased somewhat in the subsequent two years because output increased even more rapidly than during 2006–09 to reach 240 million tonnes in 2011–12 and because this time rise in procurement (to nearly 73 million tonnes) was less than output and off-take increase (to 56 million tonne) was relatively much more. Nonetheless, procurement exceeded off-take throughout the Eleventh Plan, even during 2009 drought, and present stocks are clearly too high. Costing about ₹5 per kg per year to store, these are tying up huge resources that could have been put to better use.

12.47. One important point to emerge is that although food inflation is usually ascribed to production shortfalls, policy decisions on MSP and on pricing and quantum of PDS and open market sales can be even more important. This is of course true of rice and wheat prices that are directly affected by such policies, but there are indirect effects as well. For example, milk, eggs, fish and meat had almost no effect on food inflation from 2004–05 till 2008–09, but have contributed most to food inflation subsequently (Table 12.8). As discussed earlier, much of this was due to feed and fodder shortages that the 2009 drought exacerbated. But the high build-up of rice and wheat stocks may in this context have contributed additionally. Substitution effects from lower availability of rice and wheat appear to have pushed up real prices of coarse grain to levels that compare with and most likely influenced inflation in livestock products. To maintain rapid agricultural growth, it will be necessary to continuously assess both MSP and trade policy in light of domestic production

TABLE 12.8
Real Prices of Agricultural Produce

(WPI commodity/WPI all commodities, 2004–05 base)

	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Rice	100	101	99	105	112	121	117	110
Wheat	100	101	112	115	117	127	120	108
Coarse Cereals	100	107	110	115	113	123	122	136
Pulses	100	108	134	124	124	146	137	129
Vegetables	100	109	103	118	113	124	128	115
Fruits	100	99	99	98	102	104	114	119
Milk	100	97	98	98	98	112	123	124
Eggs, Fish and Meat	100	102	101	100	99	116	133	137
Oilseeds	100	86	85	97	104	103	99	102
Sugarcane	100	96	91	87	80	81	109	107
Fibres	100	92	91	96	109	107	138	140
All Agriculture	100	99	101	104	106	115	123	122

Note: All agriculture comprises food and non-food primary articles.

trends, paying attention to such wider linkages, so as to minimise undue production imbalance and the inflationary pressures resulting from these.

12.48. Another important and related issue is the likely future demand for food. The Twelfth Plan Working Group on Crop Husbandry, Demand and Supply Projections, Agricultural Inputs and Agricultural Statistics has made projections for foodgrains and other food items by the terminal year of the Twelfth Plan, that is, 2016–17 (Table 12.9) which would suggest that present levels of cereals production already exceed likely demand at the end of the Twelfth Plan. These projections are based on actual past patterns of observed demand and the fact that cereals consumption per capita has declined since at least mid-1990s. However, it is also the case that India has very high levels of malnutrition and, although there are many reasons for this, deficiencies in calorie intake remain one of the most important. With cereals supplying over 50 per cent of total calorie intake even now, falling cereals consumption is the main reason why per capita calorie intake has not increased despite rising incomes. It is not just that the share of cereals in total food expenditure is falling; even poor people are reducing the share of income spent on all foods in order to meet other non-food

needs. In such a situation, where there is a disjunction between such a basic element of human development as nutrition and other demands in an increasingly consumerist society, there is need to ensure that minimum nutrition requirements are actually met. This is the goal of the proposed National Food Security Act (NFSA) under which a majority of the population will be entitled to some very cheap cereals. This is likely to increase cereals demand from those projected in Table 12.9, but nonetheless cereals demand is unlikely to rise much faster than population.

12.49. This means that agricultural production must diversify during Twelfth Plan so as to satisfy both tastes and nutrition. In particular, MSP policy should be more restrained for rice and wheat and made more effective in case of pulses and oilseeds where India is a net importer. Although MSP for pulses and oilseeds have been increased substantially in recent years, farmers are still not encouraged enough to put in the effort and resources required to substitute for current imports of these commodities. This is primarily because procurement efforts in these commodities, which are currently not part of Public Distribution, simply do not offer farmers the certainty that they have from procurement effort in rice and wheat.

TABLE 12.9
Demand and Supply of Food Commodities during the Twelfth Plan

(in million tonnes)

Crop/Group of Crops	Projected Demand (million tonnes)		Projected Supply (million tonnes)	Actual Production (million tonnes)	
	2016-17	2020-21		2006-07	2011-12
Rice	110	117	98-106	93	104*
Wheat	89	98	93-104	76	94*
Maize	19	22		15	22*
Coarse Cereals	36	38	42-48	34	42*
Cereals	235	253	240-251	203	240*
Pulses	22	25	18-21	14	17*
Foodgrains	257	277	258-272	217	257*
Oilseeds/Edible oils	59	71	33-41	24	30*
Sugarcane/Sugar	279	312	365-411	355	358*
Vegetables	161	189		116	147**
Fruits	97	124		59	75**
Milk	141	173		103	122**
Fish	11	14		6.9	8.3**
Meat, other than poultry	3.7	5.0		2.3	2.7**
Poultry Meat	3.3	4.3			2.2@

Source: Twelfth Plan Working Group on Crop Husbandry, Demand and Supply Projections, Agricultural Inputs and Agricultural Statistics; *4th advance estimate for 2011-12; **Production for the year 2010-11; @Production 2010-11 for only commercial poultry meat.

Public Distribution System

12.50. The Eleventh Plan period witnessed significant improvements in administration of the Targeted Public Distribution System (TPDS). A nine-point action plan has been useful in elimination of large number of ghost ration cards, reduction in leakages and greater transparency in the conduct of TPDS operations. While carrying forward these initiatives with greater vigour, there is a need for rejuvenated approach towards the TPDS during the Twelfth Plan period. The foremost amongst those is the move towards facilitating rights-based approach under TPDS by enacting the National Food Security Bill (NFSB). The Bill has been introduced in the Parliament and is expected to provide food and nutritional security, in human life-cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity. This would require strengthening of existing infrastructure and taking up new initiatives

and schemes. Reforms in the TPDS would be crucial as it would bring about more efficiency in the system with enhanced transparency and accountability. Entitlements of foodgrains are expected to shift from per household basis to per capita basis. One of the important challenges for implementation of NFSB would be proper identification of beneficiaries which may be based on the ongoing Socio-economic and Caste Census. Another important initiative required during the Twelfth Plan is the end-to-end computerisation of the TPDS operations with the help of a comprehensive Plan scheme. This should not only address current challenges but also facilitate proper tracking foodgrains and lifting by consumers using Aadhaar numbers or adopting innovative methods like smart cards.

12.51. The up-scaling of the TPDS for proper implementation of NFSB is an opportunity to expand PDS coverage to include coarse cereals, pulses and edible

oils and thereby bring scale and certainty to their procurement. However, given that consumption and production patterns vary greatly from state to state, this is probably something that can be done better by the States themselves than by any Central agency. Nonetheless, as part of PDS reform, the Central Government could moot the idea not only of decentralised procurement but also the innovative methods of transferring food subsidy. One option could be that, while the Centre continues to bear responsibility for delivering adequate quantities of cereals to every State, these may be priced close to market and food subsidy transferred to the States as recommended by the High Level Committee on Long Term Grain policy in 2002. Alternatively, subsidy could be credited directly to the bank accounts of the beneficiaries or the FPS dealers using authentication mechanism of Aadhaar numbers. Other option could be to have a comprehensive electronic benefit transfer system whereby subsidy is loaded on to a smart card and consumers have a choice of commodities or fair price shops. These initiatives are expected to bring down leakages significantly as there would be little incentive left for intermediaries to divert the PDS foodgrains into the open market. While implementing these measures, it would be pertinent to address the issue of viability of FPS and improve their functioning. The Gross Budgetary Support for the Department of Food and Public Distribution is ₹1,523 crore for the Twelfth Five Year Plan.

Consumer Welfare and Protection

12.52. Consumer welfare has been one of the core concerns of the Government since the post-Independence period. Policies have been designed and legislations enacted to protect the interests of consumers and grant them the rights of choice, safety, information and redressal. For the Twelfth Plan period, it would be apposite to expedite formulation of a comprehensive National Consumer Policy in conformity with the UN guidelines on consumer protection. Secondly, there would be a need to revisit existing legislations administered by the Department of Consumer Affairs so as to bring the provisions in line with the changes in the economy, trade, business and consumer expectations. This, inter alia, includes amendments in Bureau of Indian Standards Act and

Forward Contracts (Regulation) Act. There is also a need to conceptualise a National Policy for Quality Infrastructure covering standardisation, testing and legal metrology so as to provide the infrastructure for development of definitive standards, systems of legal metrology and conformity assessment. The commodity futures markets need to be strengthened to enable it to serve the dual purpose of price discovery and risk management. Besides, a structured system of information, counselling and mediation need to be put in place with emphasis on rural consumers. The data analysis and price monitoring also need to be more comprehensive and structured so as to make informed decisions on market intervention. The Gross Budgetary Support for the Department of Consumer Affairs is ₹1,260 crore for the Twelfth Five Year Plan.

MAJOR CHALLENGES AND PRIORITIES DURING THE TWELFTH PLAN

12.53. The main lesson from the performance in the Eleventh Plan is that while there has been a welcome turn-around from the deceleration that was evident in the decade to 2005, and while several indicators have shown marked improvement and potential to build upon, several policy imbalances exist that can prove to be major handicaps. There are also other formidable challenges, for example, a shrinking land base, dwindling water resources, the adverse impact of climate change, shortage of farm labour, and increasing costs and uncertainties associated with volatility in international markets. The Twelfth Plan will need to face these challenges boldly.

12.54. The key drivers of growth will remain:

1. viability of farm enterprise and returns to investment that depend on scale, market access, prices and risk;
2. availability and dissemination of appropriate technologies that depend on quality of research and extent of skill development;
3. Plan expenditure on agriculture and in infrastructure which together with policy must aim to improve functioning of markets and more efficient use of natural resources; and

4. governance in terms of institutions that make possible better delivery of services like credit, animal health and of quality inputs like seeds, fertilisers, pesticides and farm machinery.

12.55. In addition, certain regional imbalances must be clearly addressed. A national priority from view of both food security and sustainability is to fully extend Green Revolution to areas of low productivity in the eastern region where there is ample ground water, and thereby help reduce water stress elsewhere. Rain-fed areas continue to be at a disadvantage, and their development still requires some mindset changes.

FARM VIABILITY: SECURING ECONOMIES OF SCALE AND BETTER MARKET ACCESS AND RETURNS

12.56. Farm profitability is central to achieving rapid and inclusive agricultural growth. Improved agricultural prices (Table 12.8) were an important driver in success of the Eleventh Plan. But slower growth of demand in some major sub-sectors (Table 12.9), combined with higher input costs due to world price trends, could cause this driver to be more muted in Twelfth Plan unless offset by increase in productivity. The reports of the Commission on Agricultural Costs and Prices show low net farm revenue for many crops, particularly rain-fed. Diversification towards higher value crops and livestock remains the best way not only to improve farm incomes and accelerate growth, but also to reduce stress on natural resources which form farmers' production base. This needs better infrastructure and emphasis on integrated farming systems, combining crops and livestock, including small ruminants, for different location-specific endowments. This also requires innovative institutional and contractual arrangements so that smallholders have the requisite technology and market access.

(A) The Centrality of Smallholdings

12.57. Small farms typify Indian agriculture and this predominance continues to increase. Agriculture Census 2005–06 reported the average size of an operational holding at only 1.23 hectare, with farms less than 2 hectares comprising 83 per cent of all

holdings and 41 per cent of area. No agricultural development Plan can be credible unless it is relevant to this vast majority of farmers. Also, 12 per cent of rural households are now female headed with even smaller holding, and the feminisation of agriculture poses special problem.

12.58. An important step that would help small and marginal farmers is to reform the tenancy laws. These were originally meant to help small and marginal farmers but now operate against them. Even limited legalisation of agricultural tenancy and freeing the land lease market with proper record of ownership and tenancy status will help such farmers. Some small farmers may lease out land to shift to other occupations, provided they were assured that they could resume the land if they wished. Some large farms may lease in land and even employ the small owner on his own farm to grow specific crops under supervision. Moreover, a stark reality of India's farm situation today is that while land hunger continues unabated amongst the poor and uneducated, especially female, educated young men in richer households are leaving agriculture. The rapid rise of wages for rural casual labour during the Eleventh Plan period has further increased the relative cost of cultivating with hired labour. Many large and absentee owners are leaving land under-cultivated which could be leased out if they were assured of retaining ownership.

12.59. The Eleventh Plan had set out in detail the key elements necessary to make land policy effective for equity and efficiency. These are:

1. Modernisation of land records must be both time-bound and comprehensive. Full digitisation of land records, including GIS maps, should be completed with required survey/settlement by end of the Twelfth Plan, during which pilots should also be initiated to enable movement towards a Torrens system in the Thirteenth Plan.
2. Although there is no strong case to change existing ceiling laws, there are several pending implementation issues that can and should be addressed as land records are modernised.
3. Land issues in tribal areas require urgent and special attention.

4. Although no major new redistribution of agricultural land is likely, it is possible to ensure that all rural households have at least homestead-cum-garden plots.
5. Tenancy should be legalised in a 'limited' manner. Prescribed rents, if any, should allow a band wide enough for rents to be contracted mutually over contract periods long enough to encourage investment by tenants while protecting ownership rights so that landowners have incentive to lease out land rather than keep this underutilised or fallow.
6. Small and marginal farmers, particularly women, lack adequate access to credit, extension, insurance and markets. While every effort should be made to strengthen delivery of public services in their favour, the intervention likely to be most potent is support to group action by farmers themselves. It was suggested that subsidies in Government schemes give preference to group activity.

12.60. Most of these issues, as well as the associated matter of consolidating fragmented holdings in course of survey/settlement, are in the State domain and progress is uneven. Ongoing efforts of Ministry of Rural Development (particularly, Department of Land Resources) and Ministry of Tribal Affairs also address some of these issues, although not necessarily related directly to agriculture. However, there was little progress during the Eleventh Plan on the suggestion to redesign schemes so that subsidies favour group activity among small and marginal farmers. In fact, a criticism of the Eleventh Plan schemes has been that these diluted earlier specific support for such farmers.

12.61. Almost all the Twelfth Plan working groups set up by the Agriculture Division of Planning Commission have strongly recommended that the Twelfth Plan should put special focus on building capacity that encourages group formation and collective effort by small, marginal and women farmers, rather than simply provide additional subsidy to individuals in these categories. Existing group activity takes many forms depending on purpose. From lower tiers of formal cooperative structures in credit,

marketing, dairy and fishery, extending to self-help groups (SHGs), farmer clubs, joint liability groups (JLGs) and, more recently, to producer companies. For simplicity, these can all be termed Farmer Producer Organisations (FPOs).

12.62. The Twelfth Plan Working Group on Disadvantaged Farmers, including women has provided evidence-based assessment of the ground situation. New insecurities of tenure from urbanisation and industrialisation are impacting small farms which are efficient but lack adequate access. Its main recommendation is that a collective approach should be promoted in agriculture for small and women farmers at all points of the value chain. It cites many successful examples that stretch from the Gambhira farmer's collective in Gujarat, initiated in 1953 and still going strong, to several initiatives of women's group farming in Andhra Pradesh such as one initiated by Deccan Development Society in 1989 and another initiated by a UNDP-GoI project in 2001 and sustained since 2005 by the Andhra Pradesh Mahila Samakhya (APMSS). The most recent success story is the collective farming initiative launched in 2007 under Kudumbashree jointly by Kerala Government and NABARD. Success of these in increasing production and empowering women point to a need for States to experiment with (i) channelising NGO strength in mobilising people to encourage small holders to shift from an individual to a group-oriented approach; and (ii) facilitating land access by groups of disadvantaged farmers with appropriate arrangement for provision of inputs, including credit. Financing such experiments should be permissible under RKVY.

12.63. Since land access was the most difficult part in all the above efforts, the Working Group has suggested that, except distribution of homesteads to the homeless which should have the highest priority, future Government land distribution should be to groups of landless and women farmers rather than to individuals. This could take the form of long-term lease which would expire if the group broke down, for which it would be necessary to legalise tenancy at least for this purpose. Moreover, an innovative suggestion of both this Working Group and the

Working Group on Marketing is to set up Public Land Banks (PLB) at Panchayat level. Landowners could 'deposit' uncultivated land and receive regular payments from the PLB varying by period of deposit and rents actually obtained with the guarantee that this 'deposit' can be withdrawn with suitable notice. The PLB could then lease out to small and women farmers or their collectives. A form of 'limited' tenancy aimed at fuller agricultural use of available farm land and to slow down speculation in such land for future non-agricultural use, this idea excludes leasing to corporate entities. However, to set up PLBs will require some initial seed capital and a clear legal framework. If States provide the legal framework and the necessary guarantees, the seed capital could also be permissible under RKVY.

12.64. Access to finance, especially by small holders, is crucial for improved agricultural performance. Credit flow doubled in the Eleventh Plan but mainly by credit deepening, with little increase in farmer coverage and still leaving 60 per cent of farmers without institutional credit. There are several ways in which credit access can be widened. Primary Agricultural Co-operative Societies (PACS) still have the widest coverage and must be made more member-driven and less dependent on higher tiers. Joint Liability Groups (JLGs) are still the most appropriate mechanisms for farmers and livestock owners who have productive assets but cannot access credit because they have no land records, are located too far from banks or have last mile problems. The SHG-Bank Linkage programme is still the most appropriate financial mechanism to extend credit to marginal and dry land farmers as this allows better income smoothing since SHGs provide space for diversity in loan purposes and sizes, enabling financing of a variety of activities that such families select as part of livelihood strategies when income from agriculture is low.

12.65. Commercial banks have not supported JLGs or SHGs as much as they could have, preferring instead to comply with priority sector requirements by offering bulk finance through Non-Banking Financial Companies (NBFC) and Micro-Finance Institutions (MFI). However, NBFC-MFI lending

is mainly individual and based on standard products imposing short repayment schedules which did not dovetail with cash flows from agriculture. This caused multiple borrowings, increased risk to borrowers and led to a backlash. The solution is to restore the principle of group decisions by borrowers both in the borrowing process and in use of borrowed resources. This need not exclude NBFC-MFI so long as shortcuts are avoided. For example, NABFINS, a NBFC promoted by NABARD, lends only to groups and uses a Business Correspondent (BC) Model that also provides working capital to second level institutions like cooperatives and producer companies which aggregate, add value and market commodities. The SHGs have a stake in these second level institutions which help expand their livelihood base.

12.66. Small and marginal farmers face problems not only with shrinking land assets and with credit; they have difficulty in accessing critical inputs for agriculture such as quality seeds and timely technical assistance. In this situation, FPOs offer a form of aggregation that leaves land titles with individual producers and uses the strength of collective planning for production, procurement and marketing to add value to members' produce through pooled resources of land and labour, shared storage space, transportation and marketing facilities. These also improve bargaining power of small farmers and, most importantly, reduce transactions costs of banks and buyers to deal them. Investing in such group efforts has strong externalities.

12.67. The Twelfth Plan Working Group on Agricultural Marketing, Infrastructure, Secondary Agriculture and Policy for Internal and External Trade has in fact suggested that an institutional development component, along lines of NABARD's farmer club scheme, be introduced in all Centrally sponsored schemes to specifically target FPO formation among small producers, especially tribals, *dalits* and women. It notes that a majority of FPOs that are likely to emerge as a result of such an intervention will remain focused on addressing issues of crop planning, technology infusion, input supply and primary marketing. But, with adequate support

for business development, about one fourth to a third would seek to leverage presence further up the value chain, most likely at the lower end (for example, setting up pack houses, grading centres, small cold stores, drying or quick freezing plants). Larger FPOs, for example, existing cooperatives could provide this support and in fact could aim bigger, but issues may be different. For example, the National Dairy Development Board's SAFAL has had only limited success although the wide network and logistics of milk cooperatives make these obvious incubators for village-level aggregation of other perishable products. Therefore, the Twelfth Plan must try to mainstream support for FPO formation and capacity building using all credible agencies for the purpose: existing cooperatives, NABARD and the Small Farmers' Agribusiness Consortium (SFAC).

(B) Issues in Expanding Agricultural Marketing and Processing

12.68. A major problem facing cultivators is that they do not get remunerative prices because of uncertainties caused by inadequate market information, unnecessary controls, lack of physical infrastructure and price volatility—both domestic and global. In order to provide adequate incentives to farmers, the Twelfth Plan will have to focus on leveraging the required private investment and also policies that make markets more efficient and competitive.

12.69. Reforming the Agricultural Produce Marketing Committee (APMC) Acts should therefore have priority as emphasised in the Eleventh Plan and the Mid-term Appraisal. The introduction of the Model Act in 2003 was directed towards allowing private market yards, direct buying and selling, and also to promote and regulate contract farming in high-value agriculture with a view to boost private sector investment in developing new regularised markets, logistics and warehouse receipt systems, and in infrastructure (such as cold storage facilities). This is particularly relevant for the high-value segment that is currently hostage to high post-harvest losses and weak farm-firm linkages. While many States have moved towards adoption of the Model Act, actual progress has been limited. Often the permissions given are subject to unacceptable restrictions which make

them ineffective. Vested interests in maintaining the existing *mandi* system intact are very strong. In view of the slow progress, the Ministry of Agriculture set up a Committee of State Ministers in-charge of agricultural marketing. The Committee submitted a 'First Report' in September 2011 which has been circulated to all States and UTs. The report calls for 'speedy reforms' of Agricultural Produce Market Committees (APMC) Act across different States along with 'time-bound development' of marketing infrastructure. Calling for a ten-year perspective plan to improve infrastructure of backward and forward linkages for agriculture production and marketing, the report has suggested that agricultural marketing be given access to priority sector lending. Thus, the process to secure necessary amendments in APMC Acts and thus create the enabling legal environment is still ongoing. The Twelfth Plan will need to fast-track modernisation of *mandi* infrastructure, with adequate provision of communication and transportation, and also empower small producers through their organisations and marketing extension.

12.70. Post-harvest losses, probably average 10 to 25 per cent, being particularly high in horticulture, livestock and fisheries. Very large investments are required in developing agricultural markets, grading and standardisation, quality certification, warehouses, cold storages and other post-harvest management of produce to address this problem. Such large investments are possible only with the participation of the private sector which, in turn, require freedom from controls on sales/purchase of agricultural produce, its movement, storage and processing. Many new initiatives were taken up during the Eleventh Plan, including both terminal markets under Public-Private Partnership (PPP) mode in the National Horticulture Mission (NHM) and a model of public sector investment combined with professional management by stakeholders as exemplified by NDDDB's fruit and vegetable wholesale market at Bengaluru and APEDA's Modern Flower Auction Houses.

12.71. The Twelfth Plan Working Group on Horticulture and Plantations which studied the matter in detail has observed that participation by traders,

wholesale buyers, exporters and processors has actually been very low in all these new initiatives because of reluctance to be subject to transparent operating procedures. It has come to the conclusion that the present model of Market Sector Reforms which is trying to create space for a new set of modern markets in coexistence with much less transparent procedures in APMC regulated markets is unlikely to result in any major private investment in modern marketing infrastructure. In its view, to break the barrier of reluctance to participate in business of modern markets it is necessary as part of marketing reforms to define and introduce a common Standard Operating Procedure (SOP) for all markets: both the new modern markets envisaged as well as existing regulated markets under APMC Acts. Therefore, it proposes that managements of existing regulated markets must be made to adopt the modern marketing model: that is, undertake the auction function themselves and all payments to sellers ensured by the Market Committee through a system of bank credit limits of the buyers. This would involve redefining the role of APMC management with introduction of SOP and an open policy of registering buyers; permitting setting up of private markets in APMC areas; removal of interstate barriers to allow an unified national market, either by using entry 42 of the union list or at least for sealed container cargo; and single point levy at first point of sale.

12.72. While this entire area of regulation of agricultural product markets is thus in some flux and movement is still slow, an important initiative in the Eleventh Plan involved setting up a Warehouse Regulatory and Development Authority (WRDA) to set standards and modernise warehousing. The aim is enlarged use of negotiable warehouse receipts that can be linked to e-trading, both spot and future, so that farmers have an alternative to *mandis*. However, so far less than 300 warehouses have been registered and there is yet no effective coverage of perishable products. Cold storages have recently been brought under WRDA but minimum standards are yet to be set. This may be as difficult as meeting the requirement of cold storage additional capacity estimated at around 32 million tonnes over the next decade. Present cold storages are of inadequate quality, most

domestic component manufacturers do not have certified performance ratings, BIS standards do not exist for many critical components of cold chain infrastructure and critical storage conditions prescribed internationally for cold chain structures have yet to be validated for many Indian agro-climatic conditions or cultivars.

12.73. Although India ranks second in world production of fruits and vegetables, only 6–7 per cent of this is processed, compared to 65 per cent in US and 23 per cent in China. A well-developed food processing industry is expected to increase farm-gate prices, reduce wastage, ensure value addition, promote crop diversification, generate employment opportunities and boost exports. Further, issues concerning food processing industry are dealt with in Chapter 9.

12.74. The private sector needs to invest much more in creation of warehousing capacity, cold storages and supply chains. In this context, the Planning Commission had also set up a Committee on Encouraging Investments in Supply Chains including provision for cold storages for more efficient distribution of farm produce, which submitted its report in May 2012. The Committee has indicated that with regard to foodgrains, the Department of Food and Public Distribution has initiated steps for creation of 17 million tonnes of additional storage capacity including 2 million tonnes in the form of silos. This additional capacity is expected to take care of public sector's warehousing requirement during the Twelfth Plan. The Committee has recommended to exempt perishables from the purview of APMC, provide freedom to farmers and make direct sales to aggregators and processors, introduce electronic auction platforms for all the *mandis* where daily transaction is above ₹10 crore, and replace licensees of APMC markets with open registration backed by bank guarantees to ensure wider choice to growers and to prevent cartelisation by traders. The Committee has recommended encouraging large-scale private investments in the cold chain sector using PPP Model with Viability Gap Funding besides providing budgetary support and capitalising on schemes such as Rural Infrastructure Development Fund (RIDF). An Inter-Ministerial Group on Cold

Chain Infrastructure and Allied Sectors has been set up by the Government to facilitate implementation of these recommendations.

12.75. There is merit in planning part of such investment as infrastructure to reduce waste and enlarge markets rather than wait for corporate investment in processing or retail. The extent of wastage is not easily ascertainable and new research suggests that some of the older estimates were quite likely exaggerated, especially if quality loss leading to lower prices is not counted as waste. Also, the experience so far is that corporate entrants have not fared very well in the competition with incumbent traders since existing trading margins, although high, are in fact much less than, for example, in the USA. However, there is no doubt that modern storage and logistics do reduce waste. If such infrastructure also improves farm shares, social returns could exceed the private and justify subsidies. Subsidy rates, increased recently to 25–50 per cent, are now quite high and policy should be clear on whether the goal is just capacity targets or wider market access and improved marketing efficiency. If the latter, eligibility criteria need to be specified and also linked clearly with marketing reform. Social returns to subsidy will be more if access to both the infrastructure and to markets is more open. The real test is whether these can spawn and sustain enterprise in aggregation, grading and processing at the bottom, preferably by FPOs, but also by lead farmers and even by existing commission agents.

12.76. The recent decision to open up debate on FDI in retail must be seen in this context. With multi-brand retail already open to the domestic corporate sector, FDI in retail should not be viewed as an entirely new disruptive factor affecting traditional retail. It will only add depth and competition to the present situation. Deeper pockets and technology, and the compulsions to invest in supply chain development which is not there for domestic modern retail may accelerate investment in logistics, quicken consolidation of retail trade and create new proprietary supply chains. It must be emphasised that FDI alone will not resolve back-end issues related to modernising agricultural markets that have so

far muted the domestic corporate effort and investment. FDI has an added potential to link farmers to wider markets by expanding exports. However, the Eleventh Plan had also noted the legitimate concern that if front-end investment outpaces backward linkage, the outcome could instead be more imports and lower farm prices. The introduction of FDI will increase, not lessen, the importance of priorities identified above: marketing reforms, aggregation at the bottom and public funding of stand-alone infrastructure.

12.77. With less than 40 per cent of farm produce presently consumed in urban areas and much less processed, use of public funds to improve market efficiency will have a positive effect on farm growth. There are benefits in coordinating this effort with other steps to encourage corporate investment in this area. For example, the NHM was designed based on a concept of adequately sized area clusters so that processors could plan capacities based on anticipated future fruit production that would in turn ensure markets for farmers when trees finally bore fruit. But processors have preferred to wait and watch while farmers, not sure of adequate market for any single crop, have usually chosen to diversify their production basket. Most clusters have therefore not developed in the manner intended. A larger thrust to modernise processing and retail will require bringing more synergy between corporate actors and farmers, particularly in infusion of technology and capital at the farm end.

12.78. The Ministry of Agriculture has proposed a RKVY window for Public–Private Partnership for Integrated Agricultural Development (PPPIAD) for States to facilitate ‘large scale integrated projects led by private sector players with a view to aggregating farmers and integrating agricultural supply chains.’ The idea is to leverage corporate interest and marketing solutions to part-finance mobilisation of expertise to form FPOs and infuse technology and capital to enhance farm production and value addition. This is in line with views of various working groups, and needs to be piloted. But since this will in effect be public subsidy to contract farming, it is necessary to be clear on what should and should

not be subsidised. First, project selection should go beyond where contract farming would normally occur; that is, give priority to proposals involving FPOs composed mainly of small and marginal farmers in less accessible and rain-fed locations. Second, tangible assets that are property of the corporate partner cannot be subsidised by RKVY. Only stand-alone assets of farmers or their FPOs should be subsidised. Third, a transparent project selection mechanism will be required to rank proposals, for example, by assigning marks based on States' priorities to deliverables offered, with outcome indicators for subsequent monitoring. If this works, it might be a game changer, not only to form FPOs and widen farm-industry linkage but also to fast-track desirable changes in cropping patterns.

(C) Credit and Cooperatives

12.79. The Twelfth Plan Working Group on Institutional Finance, Cooperatives and Risk Management has projected the demand for credit during Twelfth Plan at between ₹31,24,624 crore and ₹42,08,454 crore, depending on the methodology used. At the higher end of these estimates, that is, assuming agriculture growth at 4 per cent and ICOR at 4.5, the size of the credit requirement in the Twelfth Plan period translates into about double the flow during the Eleventh Plan, that is, ₹8 lakh crore per year, as against the level of ₹4.68 lakh crore achieved during 2010–11.

12.80. This projected level of credit appears feasible in view of the Eleventh Plan achievement. As against credit flow of ₹2,29,401 crore in agriculture during 2006–07, the total institutional credit flow to agriculture in 2011–12 was ₹5,11,029 crore. But despite this very robust growth, many issues continue to confront agricultural credit, particularly in the area of financial inclusion necessary for ensuring inclusive growth. Agricultural credit continues to neglect certain sub-sectors, the flow of term lending is dwindling and there is inordinate increase in the share of indirect finance. Credit dispensation by institutions to small and marginal farmers has been disappointing, including by the Cooperative Credit Structure (CCS) which has traditionally catered to relatively smaller farmers.

12.81. On these issues, the working group has pointed to the need for more objective assessment of credit requirements for direct and indirect financing of agriculture and also to redefine the priority lending sectors. It has suggested updating of KCC databases with priority analysis of KCC percentage provided to the small and marginal farmers and more intensive use of ICT applications to track the flow of credit and transmission losses, with reference to such farmers.

12.82. Some ongoing and emerging changes appear to hold promise of triggering off better financial inclusion for banking activity:

1. The Core Banking Platform provides seamless connectivity which, with the telecom infrastructure, brings a new architecture to access financial services.
2. The BC model, together with mobile phones, can along with post offices provide significant last-mile connectivity.
3. Mandating payments (for example, of wages under the National Rural Employment Guarantee Act, pension dues and so on) through formal channels, including post offices, is helping to reach financial services to those so far not reached.
4. The enormous economies of scale generated by SHG Federations (each of 150–200 SHGs) is enabling banks to give larger loans for housing and health facilities for their members. A variety of insurance services are also being made available, including life, health, livestock and weather insurance.
5. The UID project of the GoI with biometric identity may facilitate easier opening of bank accounts, although this has yet to happen.

12.83. The financial health of the Long-term Cooperative Credit Structure (LTCCS) continues to deteriorate with accumulated losses of ₹5,275 crore by March 2010, resulting in erosion of 59 per cent in owned funds. A quick decision is warranted on the implementation of the revival package for the LTCCS too on the lines of the Short-term Cooperative Credit Structure (STCCS).

12.84. Notwithstanding, the relatively improved financial health of the STCCS following implementation of the revival package, its share in total institutional credit continues to show a declining trend. The package for STCCS was conditional to radical restructuring of coops into autonomous, democratic and self-reliant institutions without intrusion of politics and bureaucracy. The States have not implemented these recommendations with full seriousness. Therefore, Cooperative Sector Reforms should continue to be insisted upon during the Twelfth Plan.

12.85. In the interest of strengthening of the ground level tier, there is also need for considering disciplined refinancing of PACS as stand-alone institutions, provided that these are member-driven. PACS still have the widest coverage and the recent development of financing PACS through commercial banks needs to be widened, deepened and strengthened, especially in cases where higher tiers of the STCCS are weak and not in a position to fund them.

(D) Farm Income Variability: Managing World Price Volatility and Climate Risk

12.86. The Eleventh Plan document had noted that farmers are now subject to much greater risk than what Indian farmers have been used to in the past. The frequency and severity of risks in agriculture have increased on account of climate variability and this has been accompanied by much greater variability of world prices and their quicker transmission into the domestic economy. On price variability, it had recommended much greater co-ordination between MSP and trade policies and for putting in place a system whereby tariffs on imports and exports of farm products could be varied quickly in response to world price movements rather than having to take recourse to outright bans which hurt both farmers and trade. On climate variability, it had recommended going beyond current insurance measures and to put in place a tertiary mechanism for management and assessment through climate forecasting and mapping of agricultural losses.

12.87. World agricultural prices rose sharply during the Eleventh plan period, with inflation about

9 per cent per annum in US dollar terms and price volatility much higher than before, accompanied by even higher world inflation in fuels and fertiliser. It is now generally agreed that among the several factors that contributed to this were more frequent weather shocks, policies to promote biofuels and increased demand on commodity future markets as a result of speculation and portfolio diversification. There is also consensus that linkage between agricultural prices and price of oil is now very strong and may cause high volatility to persist. As compared to this, domestic Indian agricultural prices were much less volatile and domestic prices of fuel and fertiliser were increased much less than corresponding international prices. Indian farmers were thus relatively better protected against both higher price volatility and higher costs. However, this has involved repressing inflation in fuel and fertiliser and required bans on exports during world-price spikes. Co-ordination between MSP and tariff policy is still very weak. For example, while other aspects of a recent CACP suggestion for oil palm development can be met by ongoing schemes, the proactive tariff support required is a sticking point. These will need to be addressed during the Twelfth plan.

12.88. On the climate side, a number of initiatives taken by the Indian Space Research Organisation (ISRO) and the India Meteorological Department (IMD) during the Eleventh Plan have significantly improved the scope and quality both of climate data and of other remote sensing tools. Although IMD's long-range forecasts of the monsoon still have a very large margin of error, its shorter-range products not only have greater accuracy but cover an array of agro-meteorological variables with fairly high resolution. There is also much better co-ordination today between ISRO and IMD on one hand and the Ministry of Agriculture, corresponding State departments and NARS on the other. For example, Department of Agriculture and Cooperation (DAC) has set up a Mahalanobis National Crop Forecasting Centre with ISRO collaboration to augment present crop forecasts and assessment with regular remote sensing, GIS and Global Positioning System (GPS) data.

12.89. With better satellite products, an Eleventh Plan innovation was the Integrated Agro-Meteorological Advisory Service (IAAS) which now issues regular weekly Agro-Met Advisory Bulletins up to district level on field crops, horticulture and livestock. This involves agricultural universities to collect and organise soil, crop, pest and disease information and amalgamate this with weather forecasts to assist farmers in their decisions. Though still of very variable quality from district to district, and limited since district is too big a unit for useful advisory, a 2009–10 NCAER study concluded that this brought large savings to farmers. In the Twelfth Plan, a Gramin Krishi Mausam Seva (GKMS) will be launched to extend IAAS to block level, initially on experimental basis. Also, IMD will implement the Monsoon Mission aimed at generating better seasonal monsoon rainfall forecasts in different spatial ranges.

12.90. In a parallel Eleventh Plan initiative, that took advantage of IMD experience with Automatic Weather Stations technology, Government launched a Weather Based Crop Insurance Scheme (WBCIS) through the Agricultural Insurance Corporation (AIC). Initiated as a pilot in Kharif 2007 in 70 hoblis of Karnataka for 8 rain-fed crops, by 2010–11 the Scheme was being implemented in 17 States and covered more than 67 lakh farmers growing crops on 95 lakh hectares spread over 1,010 blocks in 118 districts.

12.91. At present WBCIS has about one-third the coverage of the National Agricultural Insurance Scheme (NAIS), the main crop-insurance vehicle. Based on results of crop-cutting experiments, this has been in operation since 1999–2000. Although a useful device, especially for farmers growing relatively risky crops, the main problem with NAIS is that it is not actuarial insurance. Premiums for most important crops are fixed at all-India level irrespective of risk and Central and State Governments pay for the entire excess of claims over premium received. Moreover, being compulsory for all borrowers from banks in States where it is in force, and with relatively few non-loanee farmers involved, it mainly insures banks against default following poor harvest. Further, its popularity with farmers is

limited since crop-cutting experiments delay claims/payments until well after harvest and risk covered is only of yield shortfalls at the block level.

12.92. For these reasons AIC is also piloting a Modified National Agricultural Insurance Scheme (MNAIS) since 2010 that aims to (i) reduce the insurance unit from block to village panchayat with higher indemnity as proportion of threshold yield, (ii) move to actuarial premiums supported by upfront subsidies instead of NAIS practice of Government paying the entire excess of claims over premium, and (iii) extend insurance cover to situations such as failed sowing, cyclonic rains and localised calamities, such as hailstorms and landslides. The main problem is lowering insurance unit which although good for farmers increases the cost and effort on crop-cutting experiments exponentially.

12.93. As a result, the Government of India is currently implementing four schemes, that is, NAIS, MNAIS, WBCIS and another pilot Coconut Palm Insurance Scheme (CPIS). Only NAIS is being implemented as a full-fledged scheme and the other three are being implemented on pilot basis. The pilot programmes will be evaluated early in the Twelfth Plan for future revisions/modifications to evolve a *National Agricultural Insurance Programme*. For this, the following will be necessary. First, define what should be the core programme which Government should set up and what should be left to companies to devise their own insurance products. Second, to examine the trade-off between competition and benefits of risk pooling, that is, a centralised reinsurance system. Third, arrive at an optimum mix between weather-based insurance and those dependent on yield measurements whether by crop-cutting experiments or remote sensing.

12.94. Some suggestions, based mainly on the Twelfth Plan Working Group on Institutional Finance, Cooperatives and Risk Management, are:

1. Taking as core the ongoing NAIS, modifications being made through the pilot MNAIS should be continued. The high cost of lowering the insurance unit should be dealt with progressively in

consultation with States. Centre may share part of the cost of crop-cutting experiments in the short-run but should shift to new technologies such as satellite imagery in the long run.

2. The issue of private-sector involvement in agricultural insurance can be creatively addressed, for example, through a system of co-insurance under which the AIC is lead insurer (with underwriting responsibilities and contacts with multiple agencies).
3. Weather-based insurance should continue, again focused on customisation and innovation such as double trigger (weather and yield) and index-plus products, with State Governments choosing what to subsidise. Roll-out of AWS can be demand-led and private sector also involved but with mandatory accreditation from a competent third-party designated by Government to ensure consistent and high-quality weather data. Further, Terrestrial Observation and Prediction Systems (TOPS) platforms need to be pilot tested.
4. Other innovative products such as community-based mutual insurance, savings-linked insurance, a properly designed product for contract farming arrangement and so on can help establish insurance culture, especially if linked to FPO formation.
5. Agriculture insurance, being specialty insurance with huge Governmental intervention should be seen more as a social instrument of the Government rather than a commercial instrument, hence is unlikely to be effectively administered unless backed by a statute.
6. To protect non-insured farmers from extreme financial distress, Government may consider 'Catastrophe Protection.' A blanket Life Insurance cover could be devised for at least small/marginal farmers (including tenant farmers) to meet liabilities to banks or other RFIs in the unfortunate eventuality of death and to secure some financial support to families of the deceased. Premia on such group/blanket insurance could be funded by Central/State Governments and financing banks, in full or in part.
7. Crop losses arising out of natural calamities are presently compensated by Government funding

or concessions like loan/interest waivers/deferments. This practice is fraught with inefficiency, besides crippling repayment ethics. It is, therefore, necessary that dealing with loan losses should be internalised within the banking system through the constitution of Relief and Guarantee Funds and Stabilisation Funds (set up partly with Government funding, by diversion of subsidies for loan repayments and so on).

AGRICULTURE RESEARCH AND EDUCATION

12.95. Agricultural research has played a vital role in agricultural transformation and in reducing hunger and poverty and its role in the Twelfth Plan will be crucial. The Eleventh Five Year Plan had noted that research in the past had tended to focus mostly on increasing yield potential by more intensive use of water and biochemical inputs, paying less attention to either the long-term environmental impact of this approach or to methods and practices for efficient use of inputs and natural resources (Table 12.10). But now that limitations of this approach were evident, there appeared to be lack of any clear agricultural research strategy or to assign definite responsibilities and prioritise the research agenda rationally. It had proposed that ICAR institutes undertake basic, strategic and anticipative research, focusing particularly on problems of rain-fed agriculture, while SAUs concentrate on generating required manpower and on applied and adaptive research to address local problems. It had emphasised that research should shift from a commodity based approach to a farming systems approach through convergent efforts of R&D agencies within each agro-climatic region to address local problems identified by stakeholders, including development agencies. It had also stressed the need to enhance spending on NARS and proposed to raise this to 1 per cent of agriculture GDP by end of the Plan period.

12.96. As it turns out, research spending at 2006–07 prices, although reaching nearly 0.9 per cent in 2010–11, averaged only 0.7 per cent during the Eleventh Plan. At current prices, it was even less, averaging only 0.64 per cent during the Eleventh Plan. Part of the reason was a shortfall of about 20 per cent in the

TABLE 12.10
Expenditure on Agricultural Research and Education

(₹ crore at 2006–07 prices)

		Tenth Plan	2007–08	2008–09	2009–10	2010–11	2011–12	Eleventh Plan
States	Plan	4,151	694	965	1,070	1,289	1,382	5,401
	Non-Plan	6,477	1,464	1,315	1,497	1,755	1,599	7,629
	Total	10,629	2,158	2,279	2,567	3,044	2,981	13,030
Centre	Plan	4,977	1,210	1,418	1,402	1,909	1,998	7,938
	Non-Plan	4,125	852	1,040	1,235	2,168	1,512	6,808
	Total	9,102	2,063	2,458	2,636	4,077	3,510	14,745
RKVY	Plan		55	197	63	100	160	576
Centre and States	Plan	9,128	1,961	2,580	2,534	3,298	3,540	13,914
	Non-Plan	10,603	2,316	2,355	2,732	3,923	3,111	14,437
	Total	19,732	4,277	4,935	5,266	7,221	6,652	28,351
GDP Agriculture and Allied (2006–07 prices)		33,40,648	7,64,890	7,65,601	7,73,565	8,27,969	8,50,812	39,82,837
Research/Education as % GDP Ag		0.59%	0.55%	0.61%	0.67%	0.86%	0.76%	0.70%

Centre's Plan expenditure from that originally targeted, but the main reason was inadequate spending by States. While Centre's expenditure (non-Plan and Plan, including RKVY) increased 68 per cent in real terms between the Tenth and the Eleventh Plan periods, corresponding States expenditures increased only 22 per cent. In particular, non-Plan spending on SAUs increased less than 17 per cent, less than required to meet the pay commission awards in most States. Consequently, most SAUs are understaffed and underfinanced. This is undoubtedly the most serious problem confronting NARS.

12.97. Nonetheless, new SAUs continue to be created, especially in animal husbandry, which lack adequate staff, have little infrastructure and are grossly underfunded. Emphasis has to be laid on arresting proliferation and improvement, especially in core disciplines like modern biology, to ensure a steady supply of quality human resources. ICAR should specify minimum standards, and meeting these standards could be an eligibility condition for States to get RKVY funding.

12.98. Significant contributions of public-sector research during the last decade have included

breakthroughs in basmati varieties, improved wheat varieties resistant to rust including race ug99, improved varieties of soybean, Bengal gram, mustard, chickpea and single cross hybrid maize; which have led to higher growth in these crops. Similarly, although most Bt cotton hybrids that are commercially successful are from private producers, these are based mostly on public material. With respect to natural resource management, public research claims significant contribution in developing resource conservation technologies like integrated farming, micro-irrigation, laser levelling, zero tillage and agricultural practices to improve efficiency of nutrients and water, including in situ rain water harvesting. In fruits and vegetables, better varieties and hybrids, disease management and multiplication of planting material and in livestock and fisheries, disease management technologies (vaccines and diagnostics), feed and fodder management, improving reproductive health and production of fisheries seed.

12.99. Broadly, although NARS has yet to respond to changes suggested in the Eleventh Plan, there are signs of some new research priorities and agendas. As example of new collaborative research, ICAR launched the 'National Initiative on Climate Resilient

Agriculture (NICRA)' in February 2011 as a network project with several collaborating institutions with a view to enhance resilience of Indian agriculture to climate vulnerability through strategic research and technology demonstration. The research on adaptation and mitigation covers crops, livestock, fisheries and natural resource management. The project aims to enhance resilience through development and application of improved production and risk-management technologies. It plans to demonstrate site-specific technology packages on farmers' fields for adapting to current climate risks and to enhance the capacity of scientists and other stakeholders in climate resilient agricultural research and its application. This will be continued during the Twelfth Plan.

12.100. For the Twelfth Five Year Plan, the ICAR has proposed a number of new initiatives in its manner of functioning, such as extramural funding for research, creation of funds for agri-innovations and agri-incubation and setting up of an Agriculture Technology Forecast Centre (ATFC). To improve staff strength and quality it has proposed an Adjunct Professor Scheme, Agriculture Sciences Pursuit for Inspired Research Excellence (ASPIRE), e-courses and more post-doctoral fellowships. Modernisation of SAU farms is also contemplated. In particular, it has proposed the following new thrusts:

- *Conceived Research Platforms:* Research consortia platforms are proposed for focused, time bound multi-disciplinary research in areas of 'Agro Biodiversity Management; Genomics; Seed; Hybrids; GM Foods; Biofortification; Plant Borers; High Value Compounds/Phytochemicals; Nanotechnology; Diagnostics and Vaccines; Conservation Agriculture; Waste Management; Water Management; Natural Fibre; Health Foods; Precision Farming, Farm Mechanisation and Energy; Secondary Agriculture and Agri-incubators.' These will involve partnership of ICAR with R&D organisations inside and outside NARS. Inter-departmental platforms for research in these priority areas and also capacity building in basic sciences, remote sensing and medium range agri-advisory services will be fostered involving CSIR, DBT, ICMR, DRDO, DST

research institutes as well as general universities and Ministries of Environment, Space and Earth Sciences.

- *National Agricultural Education Project:* A National Agricultural Education Project for Systemic Improvement in Higher Agricultural Education and Institution Development is proposed to be undertaken as an externally-funded project to improve education quality in State Agricultural Universities.
- *National Agriculture Entrepreneurship Project:* Another externally-funded project is proposed in order to build an ecosystem for nurturing entrepreneurship development through translational research for technology commercialisation, management of technologies for commercialisation, research for breakthrough technologies for accelerated growth and higher-economic impact.
- *Farmer FIRST:* In order to make technology delivery process more effective through the existing 630 Krishi Vigyan Kendras, this new initiative will enhance farmers–scientist contact through multi-stakeholders' participation to move beyond production and productivity to privilege the complex, diverse and risk prone reality faced by most farmers.
- *Student READY:* A one-year composite programme, the Rural Entrepreneurship and Awareness Development Yojana (READY) is proposed with the objective to develop professional skills for entrepreneurship: knowledge through meaningful hands-on experience in project mode; confidence through end to end approach in product development; and enterprise management capabilities including skills for project development and execution, accountancy and national/international marketing.
- *Attracting and Retaining Youth in Agriculture (ARYA):* This initiative will be implemented with a youth-centric approach, targeting areas of agriculture research which can be converted into viable economic enterprises and build capacities to attract rural youth to agriculture.

12.101. The Twelfth Plan allocation for ICAR is of a size that will allow spending on NARS to reach 1 per cent of agriculture GDP by end of the Plan provided

States fund SAUs similarly. The above ICAR proposals can have priority if defined in terms of deliverables, rather than areas. Also, NARS should address the following issues on priority basis during the Twelfth Five Year Plan:

- Strengthening soil organic carbon (SOC) research, particularly on the quality of organic matter and microbial activity, physical properties of SOC, validation and refinement of models and SOC dynamics under different land uses and management regimes.
- Developing Models and technology interventions on rational use of inputs, especially nutrients and irrigation water, under diverse agro-ecologies through interdisciplinary and farmer participatory mode in order to enhance their use efficiency, as also farm profits.
- The Expert Group on Pulses has been critical of NARS. Efforts to enhance the yield potential of pulses, by analysing physiological and biochemical limitations of the current crop and designing more efficient types, is a priority which should also involve improving the nutritional quality of pulses and reducing various anti-nutritional factors.
- Another priority continues to be the development of heat resistant varieties of wheat.
- Greater thrust needs to be given to post-harvest management, secondary agriculture and value addition, along with by-products and waste management. The agricultural technologies which have been developed and matured in the Eleventh Plan should be taken for commercialisation in the Twelfth Plan. Accordingly, the human resource development including para-technicians should be emphasised.
- Private agriculture input and seed companies use the research products of public system to generate profits. The public research system should seek a share in such profits which is possible if the public research system takes due care in protecting its intellectual property rights under the Protection of Plant Variety and Farmers' Rights Authority (PPVFRA). This requires development of an appropriate pricing mechanism and preparing a suitable licensing system.

NATIONAL MISSION ON EXTENSION AND TECHNOLOGY MANAGEMENT

12.102. The extension system of State agricultural departments is the weakest link in the chain between research and the farmer. Large number of vacancies of extension workers in the State Agriculture Department was one of the gravest concerns expressed by the Eleventh Plan document. During the Eleventh Plan, efforts were initiated to improve extension services by extending Central support to State extension reforms. This has resulted in 604 Agriculture Technology Management Agencies (ATMAs) to be established across the country with 21,000 new posts sanctioned with Central assistance at State, district and block levels. Also, since a continuous problem plaguing extension has been lack of organic link between the research system and the extension machinery, R&D linkage guidelines were jointly brought out by the DAC and ICAR and sent to all States and SAUs. The basic thrust of these guidelines were to get ATMAs and KVKs to work together at the district level and below, keeping in view the priorities reflected in Comprehensive District Plans. Although neither has delivered full results, there is now much greater acceptance that things must be done together.

12.103. Seed is also an area where NARS made much greater effort than in previous recent Plan periods.

12.104. Along with seeds, farm mechanisation was also highlighted earlier as a source of the Eleventh Plan labour productivity gains. In view of emerging labour shortages in many states, there is demand to expand custom hiring services, as well as for new implements. During the Twelfth Five Year Plan it is proposed to give a co-ordinated thrust on seeds, farm mechanisation and extension through a new *Mission on Extension and Technology Management*. This should also have a component to fund ICAR research platforms to find solutions to problems thrown up by extension and requiring expertise beyond SAU.

(A) Seeds and Planting Material

12.105. Three major yield successes during the last decade relate to cotton, maize and basmati rice.

These were driven by new seeds of which cotton and maize hybrids were mainly from private sector while basmati rice varieties were almost entirely public. Increased adoption of hybrids in cross-pollinated crops like cotton, maize, pearl millet and sorghum has been led largely by the private sector, which accounts for three-fourths of hybrids developed so far in the country. But there is discernable change in role of public sector in development of hybrids after 2001–02. Till 2001–02, private sector developed 150 hybrids of cotton compared to 15 by public sector; 67 hybrids of maize compared to three in public sector. In the next seven years, public sector increased its share from 8 per cent to 19 per cent in cotton, from 4 per cent to 40 per cent in maize and from 25 per cent to 58 per cent in rice, with similar changes in other crops. In parallel, public production of quality seeds of varieties have increased rapidly in recent years, expanding the public share in total seed use. Production of quality seed doubled from 140 lakh quintals in 2004–05 to 280 lakh quintals in 2009–10, contributing significantly to the Eleventh Plan yield performance. Private sector accounted for 39 per cent of this seed production. Nonetheless, the ratio of quality seed to total seed use by farmers is still much lower than norm and there is considerable scope to raise crop productivity by raising this ratio.

12.106. There are several pending issues regarding seeds. For example, at present there is no regulatory mechanism to protect farmers against non-performance, say poor seed germination rate. The Seeds Bill, 2004, introduced in Parliament in 2004, is still under consideration of the Parliamentary Standing Committee on Agriculture. It aims to regulate the quality of seeds and planting material of all agricultural, horticultural and plantation crops to ensure availability of true to type seeds to Indian farmers; curb the sale of spurious, poor quality seeds; protect the rights of farmers; increase private participation in seed production, distribution and seed testing; liberalise import of seeds and planting materials while aligning with World Trade Organization (WTO) commitments and international standards. Comprehensive and authentic databases on seed production and trade in India by public and private sectors as required under the seed and plant variety

laws need to be built up. The seed chain and the norms for quality control should be followed without any compromises or shortcuts.

12.107. At present, the public sector is responsible for most valuable germplasm while private seed agencies concentrate on more remunerative high value seed segment. Under the circumstances, clear protocols need to be developed for sharing precious germplasm with the private sector on payment of royalty, while ensuring their conservation and preventing possible erosion of the national interest in the context of international agreements on plant variety and intellectual property rights. If this can be done, there is vast scope to expand linkages between the private seed industry and public research institutions to take advantage of the positive aspects of both the segments for the benefit of farmers.

12.108. ICAR needs to revisit procedures for variety identification, release and notification to cover private and farmers' varieties and also to avoid bias in favour of varieties evolved by the testing institutions. The number of seed testing centres in the country should be expanded rapidly, if necessary in PPP mode and with third party oversight, to reduce the time taken in assessment and refinement of varieties and hybrids and technologies for production and protection of crops. There is also a need for 'Phytosanitary' certification, especially for export/import of seeds. The State Seed Corporations may establish at least one such certification centre in each major State.

12.109. The DAC made the present assessment of seed requirement during the Twelfth Plan for its proposed Seed Mission with respect to some of the major crops which brings out that even excluding requirements arising from possible shift to hybrids, seed production of varieties will need to increase by about a third to meet the projected increase in seed replacement rates. Since seed-production planning should be done with a long-term perspective (considering the viability of the seed) and also to keep buffer stock of seed to meet eventualities of natural calamities that require replanting, the actual production requirements may be higher. To meet the

seed demand for 45 major crops produced within the country and required under diverse conditions, seed hubs need to be identified to produce seed and supply the same to the farmers in each area. This will save cost of transportation. Public agencies will also need to strengthen infrastructure for seed processing, storage, transportation and distribution.

12.110. Adequate availability of quality seeds is a particular challenge for farmers in rain-fed areas where rainfall risks are high and productivity depends crucially on timely sowing within a short rainfall window. The seed system must be capable of providing seeds of contingency or alternative crops during prolonged dry spells. With protection of crop diversity important in rain-fed areas, strengthening and improving local-seed systems and linking these to NARS is a necessity for productivity enhancement.

12.111. An important part of the new Mission will therefore be to better integrate farmers with production and distribution of quality seeds through, for example, seed village programmes and by encouraging NGOs to help FPOs take up seed production. Therefore, capacity building will be vital to success. Fodder seeds that are presently neglected and scarce will need to be emphasised. Equally, the Mission must be enabled to convey to NARS accurate feedback from farmers on seed suitability.

(B) Farm Machinery

12.112. Wages have increased significantly in recent years and with labour accounting for more than 40 per cent of variable cost, many farm organisations report that shortage of labour is obstructing operational efficiency. Animal power is also declining, with commercial banks reluctant to extend loans for bullocks. This has naturally led to an increase in farm mechanisation. However, farm mechanisation has so far been biased in favour of tractors and been concentrated in irrigated-command areas paying little attention to the needs of farmers in dryland areas and the scope for introducing small machines that might be useful to meet their needs.

12.113. Considering the farm sizes and prevailing skills, farm mechanisation penetration would have

to be enhanced through promotion of custom hiring models as well as individual ownership. While draft animal power based implements and manual tools should be owned by individual farmers (with appropriate financial incentives, for example, off season employment for animal power by integrating some services such as ‘manure transport’ with MGNREGS), expensive machinery should be promoted through custom hiring. This could be done by promoting machinery service centres involving existing FPOs or by groups of farm youth trained in machinery operation and maintenance.

12.114. Greater impetus is needed to develop need-based and regionally differentiated farm machinery. Ongoing efforts by NARS need to be suitably strengthened with appropriate participation of commercial agricultural machinery manufacturers. Financial incentives could be linked to requirements thrown up by extension experience from different locations or from FPO demand. The Mission should identify and convey to NARS the critical mechanisation gaps and, in particular, specific local requirements related to machinery for soil and water conservation and gender-friendly implements.

(C) Strengthening Extension

12.115. During the Eleventh Plan, the task of strengthening and restructuring agricultural extension was approached through a wide mix of different initiatives. The context for this was that while public sector extension arrangements have weakened, the number and diversity of private extension service providers have increased in the last two decades. These include the media, NGOs, producers associations, input agencies and agri-business companies. Many provide better and improved services to farmers, but their effective reach is limited and most poor producers are served neither by public nor private sector in many distant and remote areas. Notwithstanding the important role being played by private sector extension, there are also concerns with regard to wholesomeness of information, given equity and long-term implications.

12.116. Although setting up ATMAs in almost all districts was the single most important achievement,

this went hand-in-hand with efforts to enhance quality through domain experts and regular capacity building. Other efforts included interactive ways of information dissemination, public–private partnerships and pervasive and innovative use of ICT/Mass Media. Efforts were also made to involve agri-entrepreneurs, agri-business companies and NGO experts to bolster public extension. Most of these efforts will have to continue in the Twelfth Plan since extension is a continuous process. But, in view of the initial broken down condition, there are considerable gaps even after the subsequent effort. For example, an evaluation of ATMAs by the Agricultural Finance Corporation in 2009–10 found that although 52 per cent of respondent farmers said that they gained knowledge of new practices and technologies from this, only 25 per cent felt that this had helped to increase production. It is perhaps time to conduct a country-wide extension census to identify extension resources (manpower, infrastructure, expertise) available in public and private sectors.

12.117. It is also necessary to continue with experimentation. There are number of models which have been successfully implemented in several States and countries which can be tried as pilots by ATMA and then expanded. Many civil society organisations have successfully experimented with community managed extension systems with members of the local community acting as agents of agricultural extension. In the Community Managed Sustainable Agriculture (CMSA) model of Andhra Pradesh, members of the village community have been trained and developed as Community Resource Persons (CRPs). CRPs adopt elements of sustainable and eco-friendly agricultural practices in their own farms and are in a better position to motivate and convince other farmers than normal extension workers. Working with agricultural scientists and extension personnel under the broad ATMA umbrella, CRPs can help technology transfer and diffusion.

12.118. Agricultural extension covering crops and allied sectors is primarily the responsibility of the States and it is expected that States should drive the extension reforms process. Any national effort in this regard can only support States' efforts. Moreover,

as noted by the Twelfth Plan Working Group on Agricultural Extension, while public policy in agriculture increasingly recognises importance of public–private partnership in extension, the experience so far is that PPPs have been the exception rather than the rule. States must adopt PPP, but this is not substitute for strengthening the public extension system. Future collaboration between public and private players will have to focus more on the public sector's ability to set standards and monitor progress so that these standards are enforced on all players, including public extension agents, while providing institutional training and support.

12.119. An important task of the new Mission should therefore be to consult with States so as to evolve a standards and regulatory framework for certifying and validating extension activities by all players, including public extension agents. MANAGE and SAMETIs should take the leading role in driving extension reforms at the National and State levels respectively. The corporate sector should be encouraged to involve itself in this effort and in agricultural extension in general, if only as part of their Corporate Social Responsibility (CSR). Even more important than funding under CSR, the corporate sector can support by providing adequate extension training to their extensive promotion network of distributors and dealers so as to meet required standards.

12.120. The Twelfth Plan Working Group on Agricultural Extension has noted that although ATMAs exceeded targets on training, demonstrations and exposure visits, the number of farm schools set up was well below target and that matters were lagging also on strengthening and extending Farmer Advisory Committees at every level. Since active involvement of farmers in planning and executing extension reforms was a key ATMA goal, the new Mission must concentrate on this and on feedback, particularly on technology and on agricultural plans at district and lower levels. A critical aspect of this will be ATMA–KVK coordination and more intensive ICT use.

12.121. Extension services must also be gender-sensitised, and this will require joint efforts, involving the

Mahila Kisan Sashaktikaran Pariyojana component of the National Rural Livelihood Mission (NRLM) under MoRD, the Project Directorate for Women in Agriculture of ICAR and National Gender Resource Centre in Agriculture (NGRCA) of Ministry of Agriculture (MoA). Further, since the present extension system does not pay adequate attention to livestock, fishery and fodder and separate extension machinery for animal husbandry and fishery is not feasible in many states, this function will need to be integrated with ATMA with suitable KVK and NGO backstopping. Indeed, convergence should be a basic goal of the new Mission, both on the side of technology dissemination and feedback as well as for planning integrated agricultural development.

12.122. The ultimate objective of the Mission should be to upgrade ATMA from a society operating as an adjunct to line agricultural departments to an independent entity with technical capability to offer local solutions and deliver feedback to NARS on location-specific technology needs. The larger trends of public policy point towards decentralised governance of natural resources and the promotion of growth with increasing emphasis on district (and lower) level planning. It is necessary to see decentralised planning as an iterative planning—doing—learning—planning cycle rather than as simply a one-time activity. The challenge is to institutionalise this process and ensure that the agency facilitating planning also has accountability in the overall outcome. ATMAs are a natural choice for such an agency in the present context.

SPECIFIC PLANS AND OBJECTIVES FOR THE MAJOR SUB-SECTORS

(A) Livestock

12.123. For achieving growth rate of 5–6 per cent per annum the animal husbandry sector would need to address important challenges during the Twelfth Plan. These include delivery of services, shortage of feed and fodder and frequent occurrence of deadly diseases. Compared to its contribution in the economy livestock sector has received much less resources and institutional support. Livestock extension remains grossly neglected. The country still lacks

adequate facilities and the infrastructure for disease diagnosis, reporting, epidemiology, surveillance and forecasting. Livestock markets are underdeveloped, which is a significant barrier to commercialisation of livestock production. Besides, the sector is also coming under significant pressure of increasing globalisation of agri-food markets. Although there is demand for Indian meat products in international markets, lack of international processing standards is a hindrance. Unfortunately, schemes on modernisation of slaughterhouses and by-product utilisation have not been effectively implemented. In the animal husbandry sector, the major priority areas during Twelfth Five Year Plan will be breed improvement, enhancing availability of feed and fodder and provision of better health services, including proper breeding management. Conservation and perpetuation of diverse local germplasm, which are adaptable to Indian climate conditions and resistant to various endemic diseases, will be another important area, with clearer focus on sub-sectors such as small ruminants that have so far been neglected.

12.124. An important Twelfth Plan initiative is the National Dairy Plan (NDP), which has already been launched as a central sector scheme with credit support from the International Development Association (IDA). To be implemented by the National Dairy Development Board (NDDB) through a network of End Implementing Agencies (EIAs), mainly dairy cooperatives and producer companies, this aims to (i) increase productivity of milch animals and thereby increase milk production and (ii) provide rural milk producers with greater access to the organised milk-processing sector. These objectives would be pursued through adoption of focused scientific and systematic processes in provision of technical inputs, supported by appropriate policy and regulatory measures.

12.125. An important sub-component of (i) above will be scientific progeny testing and pedigree selection of bulls for semen required in artificial insemination (AI) services. It is planned to make available about 900 high genetic merit bulls for replacement of bulls maintained at all 'A' and 'B' graded semen stations and thereby achieve 100 per cent high genetic

merit bull replacement at these semen stations by end of the Twelfth Plan. It is estimated that this would produce some 100 million high-quality disease-free semen doses annually.

12.126. Taking NDP into account and, with RKVY incentives for States to substantially enhance public sector investment in agriculture and allied sector during the Eleventh Plan, the Department of Animal Husbandry, Dairying and Fisheries (DAHDF) has also decided to redesign its schemes. It aims to provide more flexibility to States while reducing the number of Centrally Sponsored Schemes (CSS) and reorientating these to secure better programmatic focus.

12.127. On genetic improvement in bovines, the current major programme is the 'National Project for Cattle and Buffalo Breeding (NPCBB)' which is being implemented since October 2000. Unlike NDP, which aims to provide breeding services from the dairy side, NPCBB is administered as part of States' veterinary services. DAHDF proposes to continue NPCBB in this present form since the DAHDF target is to expand the artificial insemination programme from present coverage of about 25 per cent of breedable population to 50 per cent, which will require an expansion of AI services beyond the about 35 per cent coverage planned for under NDP. This is because NDP will not cover all States and there are likely to be farmers not covered by dairy-led breeding services even in States covered by NDP. Moreover, States have already established Livestock Development Boards (LDBs) in the present format to implement bovine breeding programmes with a stated focus on development and conservation of important indigenous breeds. The critical requirement is that NPCBB and States' efforts through LDBs share common standards and protocols with NDP in progeny testing, pedigree selection and to improve conception rates. If so, resources are sufficient to achieve 5 per cent growth of milk production in the Twelfth Plan

12.128. Since standards and protocols will be the key to success on the breeding side and basic commonality will have to be brought between NDP, LDBs and

NPCBB, there is need for some architectural redesign during the Twelfth Plan. Therefore, although NPCBB will continue, this will be as a component of a new *National Programme for Bovine Breeding and Dairy (NPBB)* which will subsume all DADF existing schemes on dairy development. Thus, NPBB will have two main components, namely National Programme for Bovine Breeding (NPBB) and Dairy Development. The component for Dairy Development will mainly focus on States/areas not covered under NDP and, in addition to existing support areas, convergence will be attempted in a phased manner so that dairy cooperatives which are not part of NDP also offer breeding and extension services. It is hoped that such combined activities in respect of dairying with breeding will be more effective in extension of artificial insemination services, feed management and marketing of good quality of milk which are essential for improving productivity and income of farmers. In the meantime, NPBB will continue existing NPCBB functions through LDBs and the veterinary side with two areas of focus: first, to harmonise breeding standards and protocols; and, second, to achieve the so far unrealised stated focus on development and conservation of important indigenous breeds.

12.129. The main programme on the veterinary side will be an expanded scheme for *Livestock Health and Disease Control*. Such an expansion is necessary because occurrence of diseases like foot and mouth disease (FMD), hemorrhagic septicemia (HS), brucellosis, mastitis, blood protozoon and so on, have been accentuated with introduction of exotic breeds. Taking into account the economic losses from these diseases, and also those of small ruminants (PPR or peste-des-petits ruminants), particularly to small, marginal and landless farmers including women farmers, it is necessary to have a strong focus on national control programmes for all major animal diseases, backed by epidemiological analysis and assessment of the animal diseases in different agro-climatic regions. Unrestricted movement of livestock, as well import of germplasm, and changes in ecosystems due to climate change are adding to occurrence of diseases. The availability of improved, potent and efficacious vaccines meeting international

standards against major prevalent diseases can enable better management, containment and control of the diseases. The new programme will associate all ICAR institutes specialising in animal diseases and, in consultation with the State Governments, formulate and implement more effective strategies for control of different diseases.

12.130. The third major programme of DADF will be the *National Livestock Mission (NLM)*. Apart from bovine breeding, dairying and livestock health schemes, DADF runs a plethora of other schemes relating small ruminants, poultry, piggery and fodder development which although of extreme importance, especially to small, marginal, landless and women farmers, have so far not received focused attention. The multiplicity of small schemes in these livestock sectors has been a major constraint since this limits the capability of states to effectively access funding under various schemes. In order to provide greater flexibility to states in formulating and implementing various projects, it is proposed to merge these schemes with the main objective of achieving sustainable development and growth of the livestock sector.

12.131. The NLM will have an important mini-mission of feed and fodder, with an objective to substantially reduce the gap between availability and demand. The deficit of dry fodder (10 per cent), concentrates (33 per cent) and green fodder (35 per cent) continues to be high, although availability of feed resources has improved somewhat. The forage and fodder seed need varietal and quality improvement alongside better availability. The NLM will encourage seed companies and SAUs to take up forage seed production on a priority basis. Developing common property resources, including grazing land and wasteland, and better utilisation and enrichment of crop residues/agricultural by-products is the other priority. Ration balancing, which is being promoted under NDP, will also be promoted under this mini-mission on feed and fodder.

12.132. The NLM will also have an additional mini-mission relating particularly to development of small ruminants, but also covering poultry, piggery

and other minor livestock species. While subsuming some of the existing Central Sector Schemes for poultry, small animals and fodder development, the objective will be fuller development of the animal biodiversity available in our country, which is a rich treasure of germplasm. NLM will also focus on predominantly non-descript pig populations, concentrated in NE region and eastern region there have poor productivity. Indian poultry industry is well equipped and organised to achieve target growth rate of 11 per cent for commercial broilers and 7 per cent for layers although it failed to diversify in favour of duck, quail, turkey and emu production. Need-based import of grandparent stock of reputed international brands may be continued with strict enforcement of bio-security measures. Rural poultry sector however, needs financial, infrastructure and technological support to raise the present 2 per cent growth rate to 3 per cent. All these, including the conservation of threatened breeds, will be covered by NLM in a flexible but more focused programmatic manner.

12.133. Other issues that NLM will address include livestock insurance and extension and any innovative initiative proposed by states for development of the livestock sector, for example, to deal with unhygienic slaughtering and processing. If State Governments notify minor veterinary services accordingly, shortage of human resources of veterinary staff could also be supplemented by recruitment of para-vets, similar to that of ASHA, to provide minor veterinary services and supplement the livestock-extension activity in the States. In this context, it might be noted that as public-sector spending is enhanced for development of livestock, there is need for continuous assessment of the efficacy of AI and of animal health programmes in terms of success rates, lactating efficiency and of potential and actual yield per animal.

(B) Fisheries

12.134. Potential of fisheries sector in providing quality food and nutrition, creating rural livelihoods, advancing socio-economic development in the rural and far flung areas is widely demonstrated and globally recognised as a powerful tool for poverty reduction and fostering rural development. Annual fish production has reached to the level of 8.30 million

tonnes during 2010–11 (P). Annual export earning has also touched record US\$2.9 billion mark contributing about 17 per cent to national agricultural export. About 14.5 million people are engaged in fishing, aquaculture and other allied activities of which about 75 per cent are in inland fisheries and the remaining in marine fisheries.

12.135. In marine fisheries, uncontrolled fishing capacity has led to over-exploitation of the coastal resources. The estimated potential of the offshore waters offers opportunities which calls for upgradation of the fleet as well as skills and capacities of the fishers and incentives to promote diversified fishing in the offshore waters. Implementation of Monitoring, Control and Surveillance (MCS) as a new programme in the ensuing Plan is expected to bring more discipline and regulate the activities so as to maintain the growth rate in a sustainable manner. There is a need of additional infrastructure and also upgradation of facilities infrastructure for landing and berthing facilities of marine fishing fleet and for domestic marketing that have been the main reasons for post-harvest losses.

12.136. Freshwater aquaculture, which contributed to the 'Blue Revolution' in the country in late 1970s, is now almost stagnating in terms of species diversification and yield rates due to less focus on sustainable development of inland capture fisheries in past Plans; increasing pressure on the resources, including habitat degradation; and multiple use of inland water bodies with least priority to fishery requirements. Average yield rates are around 1,000 kg/ha/yr, against potential of 3–4 thousand kg/ha/yr. The efforts to raise productivity should, however, be accompanied by formulating guidelines and regulatory measures for the judicious use of critical inputs keeping in view the principles of the FAO Code of Conduct for Responsible Fisheries.

12.137. Quality fish seed is the most critical input to enhance the productivity and production of fishes. But, there are no organised brood-stock production and management facilities in the country. Therefore, there is need to set up brood banks in each State with one at the Central level. There is need to promote

commercial fish feed mills and indigenously formulated fish feeds with locally available ingredients by supporting the private players with enhanced capital subsidy especially in the States where there are no feed mills.

12.138. Adequate infrastructure is not available for disease diagnosis and treatment for fish disease management. There is a strong need for capital investment as well as support for the State Governments in capacity building and managing the disease diagnostic laboratories. There is also a need for creating a disease surveillance and communication agency/mechanism at National level along with its wings at suitable regional locations to build awareness and send alerts to the stakeholders. This agency shall have adequate regulatory powers to ensure the disease control.

12.139. The gradual decline of Freshwater Fish Farmer's Development Agencies (FFDAs) and Brackish water Farmer's Development Agencies (BFDAs) and their resultant poor performance coupled with weak extension services has impacted the overall growth of aquaculture in the country. Rejuvenation and consolidation of the two field-level agencies (FFDA and BFDA) into a single agency—Fisheries and Aquaculture Development Agency or can undertake extension of technologies, promote networking of farmers and fishers (mainly from reservoirs) and provide effective liaison between the farmers and developmental and other extension agencies such as the Krishi Vigyan Kendras and the ATMAs as well as sourcing the public finance for fishers.

12.140. An important initiative of Government of India for development of fisheries sub-sector has been to launch 'National Fisheries Development Board' (NFDB) as a Special Purpose Vehicle (SPV) in the year 2006 for implementing fishery developmental schemes in an integrated manner. The scope of NFDB would be expanded to include management of fish diseases and creation of related infrastructure which is a gap in the present scenario. During the Twelfth Plan, the existing CSS on inland and marine fisheries (except welfare of fishers) will

be merged with NFDB to facilitate expansion of fisheries through integration of a wide array of activities, but with its main focus on inland fresh water fishery. The schemes will be implemented under the aegis of NFDB removing any duplication or overlap of efforts. This clear demarcation of work, it is hoped will enable the growth rate of the sector to rise to 6 per cent during the Twelfth Plan.

12.141. DADF would focus its efforts on policy, regulation and welfare of fishers, and will implement the scheme relating to welfare of inland and marine fishers. The DADF will also handle the strengthening of fisheries data base, implementation of the proposed scheme on Monitoring, Control and Surveillance (MCS), all fisheries policy and legal matters, coordination with the sister Ministries/Departments at the Centre and the States to make the sector's foundation more robust and sustainable and build stronger linkages between research and development. Future course of fisheries management will have to work at two fronts—sustainable utilisation of healthy resources and rehabilitation of threatened resources by habitat restoration and appropriate conservation measures. Climate change and its possible impact on fisheries and fishers is again an additional challenge. Thus, the future course of management will require highest level of compliance of acts and regulations, extensive adoption of BMP and implementation of CCRF (Code of Conduct for Responsible Fisheries introduced by FAO) which would be possible only through the cooperation and active participation of resource user communities as partner in the development and management process.

(C) Horticulture

12.142. With increasing per capita income, Indians are consuming more of fresh and processed horticultural products indicating growing scope of horticulture by improving crop productivity and efficiency in the value chains. The initiatives taken in the horticulture sector during the Tenth Five Year Plan have helped in achieving high growth in production. During the Eleventh Five Year Plan, the growth rate of horticulture is expected to be 4.7 per annum, slightly short of the projected 5 per cent. There has been a marked push to the expansion in area under

horticulture crops since taking up of a number of initiatives for horticulture development through NHB, TMNE (NE) and then NHM in 2005–06.

12.143. However, in quest for area-expansion efforts, the states have neglected due thrust on increasing productivity of existing orchards through technology infusion or by capital investment in fertigation, input management, plant protection and farm mechanisation. The area expansion programmes have also lacked the proper backward linkage with supply of quality seed and planting material. Even where Nursery Act exists, it has not been enforced effectively. A proper system of accreditation and rating of nurseries, with clearly defined protocols, is the most important priority and will have to be put in place during the Twelfth Plan.

12.144. Adequate attention to post-harvest management and market development and processing has yet to pick up and is the weakest aspect of diversification towards high-value products resulting in frequent and sharp fluctuations in prices of fruits and vegetables in domestic market. As discussed earlier, marketing sector reforms implemented by States have so far not resulted in efficient marketing of perishables, or put in place transparent system of auction and price discovery. There are huge logistic gaps between production clusters and marketing centres, often at long distance, and private sector investment in post-harvest management and in marketing infrastructure has not come forward to the desired extent. There is also lack of proactive steps to enhance export competitiveness for high-end export destinations. The availability of adequate regular, uninterrupted, affordable power supply for setting up infrastructure like tissue culture labs, seed processing plants, bio control labs and post-harvest management units like cold storages, ripening chambers and so on is a constraint which needs to be addressed at least in and around horticulture clusters. Since horticulture operations are cost intensive and hi-tech, horticulture growers need to be provided affordable credit with higher ceiling and insurance against risk.

12.145. The horticulture development missions depend on a loose set-up of Technology Support

Groups for technology inputs. This has proved inadequate. Many States do not have adequate technical trained manpower to implement programmes. Unless State Governments fill up vacant posts and create additional posts to provide necessary technical input, it should be deemed that they are uninterested and the mission wound up in those States.

12.146. During the Twelfth Five Year Plan the National Horticulture Mission will integrate the several existing schemes in this sector and aim at holistic growth of horticulture sector, including bamboo, through area-based regionally differentiated strategies, which include research, technology promotion, extension, post-harvest management, processing and marketing, in consonance with comparative advantage of each State/region and its diverse agro-climatic features. The Mission will also facilitate marketing reforms discouraging payment of unnecessary market levies and encouraging private investment for setting up horticulture produce markets. While continuing existing efforts, and aiming at 5 per cent growth of horticulture production during the Twelfth Plan, the main objective will be to build required capacities at State level, and assess their seriousness, so that the horticulture development related activities can be transferred fully to States by end of the Twelfth Plan.

12.147. Another objective will be to improve horticulture statistics which continue to be weak, lacking both a validated methodology for data collection of horticulture crops and adequate machinery to collect such data. Generation and dissemination of quality data can also help in averting frequent situations of gluts and shortages and exploitation of such situations by the middlemen and speculators. DAC needs to take up a one-time horticulture census with the objective of generating reliable base line data. Further, as recommended by NSSO committee on improvement horticulture statistics, there is need to set up an extensive network of Horticulture Information Systems (HIS) with proper data units in all relevant districts and at State and Centre level covering all relevant aspects. To facilitate this, at least 3 per cent of Mission funds should be earmarked for this purpose.

(D) Food Grains and Oil Seeds

12.148. Since cultivated land is limited, with potential for only marginal future increase through higher cropping intensity or development of cultivable wasteland, future increase in production will have to come mainly from yield improvement. Declining average annual growth of food grains yields from 3.2 per cent in 1980s to 1.6 per cent in 1990s and further to only 0.6 per cent during the Tenth Plan, taking this well below population growth, had led to widespread concern about future food security. The issue was, therefore, analysed fully with several alternatives considered and the *National Food Security Mission (NFSM)* was formulated for the Eleventh Plan. This was based on an assessment of yield gap data then available, and was focused on increasing yields in low-yield districts using a variety of known interventions, with particular attention to availability of quality seeds. Although this has paid off, with food grains yield growth increasing to 3.3 per cent during the Eleventh Plan, a valid question regards continuation of NFSM is whether yield gaps are still large?

12.149. A committee set up under Chairmanship of Chief Minister of Haryana has recently examined the issue and suggested continuing with the strategy to bridge the gap between real and potential yields. The analysis of gap between potential and achieved yields presented to this committee suggests that there is considerable potential of increasing yields even in high productivity irrigated areas with the current technology. For these areas, the strategies will need to concentrate on propagation of balanced use of fertilisers and application of micro-nutrients, water and soil-saving technology. In case of wheat, however, there is need to step up research to develop varieties resistant to temperature. The major yield gaps are due to management practices. Other reasons for this gap need to be ascertained through specific studies and addressed through appropriate interventions.

12.150. In addition to enhancing productivity of food grains in the low productivity areas, it is equally important to stabilise the productivity gains in these areas as well as in areas where productivity levels are comparatively high. With these issues in mind, the *National Food Security Mission (NFSM)*

will be revamped during the Twelfth Plan. While the Eleventh Plan approach of focused attention on identified districts and crops in a location specific, target-oriented manner will continue, greater attention will be put in most areas to shift from exclusive focus on individual crops to the cropping system/farming system approach. In particular, the Mission will be extended to cover coarse cereals and fodder, in addition to wheat, rice and pulses as at present. The Mission contemplates that promotion of package of practices in compact blocks in a hand holding approach would not only help in enhancing the production and productivity of a region but also help in changing mindsets of farmers due to its positive large-scale impact. This approach will ensure inclusion of all farmers in the compact block irrespective of their size of holding or social status and will be compatible with other efforts that encourage strengthening of institutions, including building of farmers organisations and FPOs. The Mission will also build upon the Eleventh Plan experience regarding conservation agriculture.

12.151. However, the main way in which NFSM will be extended during the Twelfth Plan is through greater emphasis on strategic-area development. The two programmes that were started as RKVY sub-components in the Eleventh Plan namely, the 60,000 pulses village programme and the intensive millets production programme will largely be shifted into NFSM. On another sub-component of RKVY—Bringing Green Revolution in Eastern India (BGREI)—a view will be taken by DAC in consultation with States regarding format of its continuation during the Twelfth Plan. Also, some additional districts in Himachal Pradesh, Uttarakhand and the north-eastern region will be included to provide a specific thrust on foodgrains cultivation in hill areas.

12.152. Such restructuring of RKVY and NFSM will address the problem of bridging the existing large gap between potential and realised rice yields in eastern States and the challenge of increasing pulses production. Since BGREI allows components which are not part of NFSM, and since development of the eastern region requires significant investments in power and marketing infrastructure, the final design

of how to proceed on the relative contributions of RKVY and NFSM will need to be decided in consultation with the States. Also, since a counterpart of expanding rice production in eastern States is to reduce rice area and resulting groundwater stress in the North-West, a decision will have to be taken on what components of the latter effort should be stressed in NFSM/RKVY.

12.153. Preliminary targets under the NFSM for the Twelfth Plan are enhancing production by additional 25 million tonnes of foodgrains consisting of 10 million tonnes of rice, 10 million tonnes of wheat, 3 million tonnes of pulses and 2 million tonnes of millet. Also it aims to expand fodder production to meet the demand both of green and dry fodder. In all probability, the requirement of sufficient quantity of dual purpose feed and fodder will require raising this target to 30 million tonnes, with additional production of coarse cereals put at 7 million tonnes. All these targets are less than was actually achieved during the Eleventh Plan and are consistent with demand forecasts. This would amount to targeting 2–2.5 per cent increase in foodgrains production in the Twelfth Plan.

12.154. Another consequence of the expanded scope of NFSM will be to absorb the pulses and maize components presently in the Integrated Scheme for Oilseeds, Oil palm, Pulses and Maize Development. During Twelfth Five Year Plan, it is proposed to replace this scheme with a new *Mission on Oilseeds and Oil Palm* which will be launched with a preliminary target to increase the production of oilseeds by at least 4.5 per cent per annum, that is, the same rate of growth as actually achieved during the Eleventh Plan. The core of this Mission will therefore be to continue past efforts with a clearer focus on oilseeds. However, since production of oilseeds has not been able to match the increasing demand of edible oils, resulting in persistence of a huge gap between demand and production of edible oils in the country, the Mission will also aim to expand area under oil palm to realise the latent potential of the oil palm in the country. This part of the Mission will fully consider a proposal made recently by CACP and incorporate whatever is feasible.

NATURAL RESOURCES

(A) Water

12.155. The water resource potential of India is assessed as 186.9 million hectare meter, mostly from rainfall. With annual availability still more than utilisation and with its uneven spatial and temporal distribution leading to floods/droughts in some or other parts of the country every year, there is a strong demand to fully utilise this potential as soon as possible. The total States proposals on investment in Irrigation and Flood Control for the Twelfth plan add up to about ₹4,00,000 crore, which alone would amount to over the 4 per cent of cumulative GDP from agriculture and allied sectors being targeted as total public investment in this sector during the plan. Recognising both the criticality of irrigation for agricultural growth and the potential available, the Centre's Twelfth plan gross budgetary support for development of water resources (including on AIBP) is being stepped up to ₹1,09,552 crore from the Eleventh plan actual expenditure of ₹41,427 crore.

12.156. However, the performance in respect of creation and utilisation of irrigation facilities during the Eleventh Five Year Plan was not satisfactory. The original Eleventh Five Year Plan target for creating irrigation potential was 16 million ha. This was subsequently revised to 9.5 million ha, which has been achieved. However, utilisation out of the created potential is expected to be only 2.7 million ha. The ever increasing gap between created potential and its utilisation is an issue that is a Twelfth Plan priority, steps to address which are discussed in another chapter.

12.157. In recent decades irrigation facilities have increasingly been created through exploitation of groundwater deployment. However, non-judicious exploitation of groundwater for irrigation purposes in India is already showing signs of crisis in many parts of country. Studies report that more than 26 cubic miles of groundwater has already disappeared from underground aquifers in large areas of Haryana, Punjab, Rajasthan and Delhi, between 2002 and 2008 (NASA 2009). Global Runoff Data Centre, University of Hampshire and International Earth

Science Information Networks have projected that around 30 per cent area of India falls in the extreme water scarce zone having less than 500 m³/person/year supply of renewable fresh water. The information from the Central Ground Water Board reveals that situation has worsened in most of the states since 2004. The groundwater level has been declining annually by about 4 cm during the past decade, often resulting in drying of rivers and wetlands and contamination with arsenic, fluoride and other toxic substances. This requires effective regulatory framework and participatory watershed development, especially because groundwater extraction is often highly unfavourable to the small farmers who cannot keep investing to tap deeper aquifers. Apart from developing appropriate regulatory framework, and people's participation, the need of water saving devices and crop planning cannot be overemphasised. Micro-irrigation coverage will be given priority both in irrigated and rain-fed areas, as part of comprehensive local planning.

(B) Watershed Development

12.158. Watershed development has long been one of the major channels directing public investment to natural resource base and production systems in rain-fed agriculture. From their earlier emphasis on soil and water conservation, the focus in case of watershed projects is shifting towards livelihood security and income generation. It is also now generally accepted that to be effective, the watershed development and soil conservation investments have to be complemented with farming systems investments in a watershed-plus framework that takes into account the diversity of rain-fed agriculture.

12.159. However, despite considerable emphasis on this in the Eleventh Plan design and development of common guidelines, actual performance in regard to watershed development was poor during the Eleventh Plan. The details of the Eleventh Plan had target and achievement may be seen in the Chapter on Water. Since all watershed development programmes have been transferred to the Department of Land Resources, the Ministry of Agriculture has to redefine its initiatives for rain-fed farming and sustainable agriculture.

12.160. The National Rainfed Area Authority was constituted with the specific objective of integrating schemes/programmes and activities of various Departments of the Centre and the State Governments with regard to dryland farming as well as providing technical back stopping for watershed development in a comprehensive manner. The authority was expected to play a major role in training of the officials associated with the watershed development projects and also take a lead role in social mobilisation which is critical in the success of the watershed development programmes. It was also expected to take up studies for evaluation of the implementation of projects by the States. So far Departments both at the Central and State level has not taken much interest in associating NRAA either in evaluation of the programmes or for providing technical input for these. NRAA expertise will be better utilised during the Twelfth Plan.

(C) Land and Soil Health Management

12.161. Land is the prime natural resource of which 140.02 million hectares are net sown area. Since 1990–91 there is gradual but sustained decrease in net sown area from 143 million hectare to 140 million hectares with corresponding increase in fallow land. The demand from non-agricultural uses like industrial and urban requirement as well as speculative demand on account of rising land value is putting pressure on availability of land for agricultural use. There is an urgent need for State Governments to lay out clear policies to protect productive agricultural land and provide specific guidelines on preservation of commons and their protection. There are also other important institutional and policy issues concerning land: proper recording of land titles, easing tenancy rigidities, computerisation of land records as well as addressing declining size of holdings.

12.162. An important aspect of land is its degradation in terms of mechanical, chemical and biological. Widespread and continuing erosion of country's natural resource base is threatening the sustenance of agriculture sector's growth rate. Over 120 million ha have been declared degraded or problem soils (NAAS 2010). Conservation agriculture (CA),

integrated nutrient management, carbon sequestration, erosion control, saline and alkaline soils management, legislation for soil protection, development of remote sensing and GPS-based Decision Support System (DSS) and amelioration of polluted soil are required to rejuvenate deteriorated soils.

(D) Use of Fertilisers and Pesticides

12.163. Fertiliser consumption in the country has been increasing over the years and now India is the second largest consumer of fertilisers in the world, after China, consuming about 26.5 million tonnes of NPK. However, imbalanced nutrient use coupled with neglect of organic matter has resulted in multi-nutrient deficiencies in Indian soils. These deficiencies are becoming more critical for sulphur, zinc and boron. As nutrient additions do not keep pace with nutrient removal by crops, the fertility status of Indian soils has been declining rapidly under intensive agriculture and is now showing signs of fatigue, especially in the Indo-Gangetic plain. Potassium is the most mined nutrient. Sulphur deficiencies are also showing up in all parts of the country especially in the southern region. In a comprehensive study carried out by ICAR through their Coordinated Research Project on Micronutrients, Toxic and Heavy metals, based on an analysis of 2,51,547 soil samples from different states, it was found that 48 per cent of these samples were deficient in zinc, 33 per cent in boron, 13 per cent in molybdenum, 12 per cent in iron, 5 per cent in manganese and 3 per cent in copper. The micronutrient deficiency is a limiting factor lowering fertiliser response and crop productivity. As a result of over-emphasis on chemical fertilisers and imbalanced fertiliser use, efficiencies have become abysmally low: hardly 35 per cent for N, 15–20 per cent for P and only 3–5 per cent for micronutrients like zinc, resulting not only in high cost of production but also causing serious environmental hazards. At this rate, the National Academy of Agricultural Sciences has estimated that for meeting the food needs of the country by 2025, India may have to increase NPK supply to over 45 million tonnes from the current level of 26.5 million tonnes and of organic manures from 4 to 6 million tonnes. The Twelfth Plan envisages NPK demand at 34–36 million tonnes by 2016–17, but the more important

priority should be to give much greater emphasis than hitherto on fertiliser use efficiency and soil health.

12.164. Restoration of soil health requires initiatives for continuous monitoring of soil health, measures to arrest decline of soil health, creating adequate facilities for soil testing, fertilisers testing, developing and upgrading testing protocols, ensuring judicious and efficient use of fertilisers and pesticides. Judicious use of fertiliser requires adequate soil testing facilities. By 2010–11 there were 1,049 soil tests labs in the country with a soil analysis capacity of 106 lakh soil samples per annum. The State Governments have issued 40.8 million soil health cards to the farmers by October 2011. Although a massive achievement in fairly short time, this remains far below the requirement of soil testing capacity. To augment the capacity the State Governments need to utilise resources from Rashtriya Krishi Vikas Yojana and also engage State Agricultural Universities, Agricultural Produce Marketing Committee and other institutions. There is need for widespread awareness creation for soil-test-based fertiliser use by involving State Agricultural Universities and KVKs and NGO and other stakeholders.

12.165. Measures to soil health improvement need to be comprehensively centred on addition of soil organic matter in substantial quantities over time. The efforts for production and use of available biological sources of nutrients like bio-fertilisers, organic manure, bio-compost for sustained soil health and fertility and improving soil organic carbon and so on as alternative inputs have been inadequate so far. For promotion of these inputs in conjunctive use with chemical fertilisers, and to promote organic farming we need to formulate and define standards for unregulated organic and biological inputs and bring them under quality control mechanism and define/upgrade standards and testing protocols.

12.166. Similarly, use and availability of safe and efficacious pesticides and their judicious use by the farming community is critical to a sustained increase in agricultural production and productivity. Quality of pesticides is monitored by the Central

and State insecticide inspectors who draw samples of insecticides from the market for analysis in the 68 State Pesticide Testing Laboratories (SPTLs) that have a total annual capacity of 68,110 samples in 23 States and one Union Territory. However, sale of low quality/spurious pesticides by dealers is widespread and is an issue that States need to handle with seriousness. Further, since use of synthetic pesticides needs to be confined to target control in the right quantity and at the right time, presence of pesticides residue in food commodities is becoming a serious food safety matter. DAC implements a scheme for monitoring pesticide residues and sharing outcomes of the sample analysis with State Governments as well as advising States to take necessary action including promotion of the Integrated Pest Management (IPM) approach, which emphasises a safe and judicious use of pesticides. Many NGOs, however, represent that sporadic promotion of IPM is not helping in establishment of sustainable agriculture practices and that Non-Pesticidal Management (NPM) of pests is the only sustainable answer.

NATIONAL MISSION FOR SUSTAINABLE AGRICULTURE

12.167. A major new mission that will be launched during the Twelfth Plan is the National Mission for Sustainable Agriculture (NMSA). Conceived originally as part of the National Action Plan on Climate Change (NAPCC), this aims at transforming Indian Agriculture into a climate-resilient production system through adoption and mitigation of appropriate measures in the domains of both crops and animal husbandry. Since a number activities relating to sustainable agriculture are already parts of other proposed missions, NMSA as programmatic intervention, will primarily focus on synergising resource conservation, improved farm practices and integrated farming for enhancing agricultural productivity especially in rain-fed areas. Key deliverables under this mission will be developing rain-fed agriculture, natural resource management, enhancing water and nutrient use efficiency, improving soil health and promoting conservation agriculture.

12.168. Nonetheless, since sustaining agricultural productivity through climate and other challenges to the natural resources base is the focus of this mission, it will have to go beyond its programmatic interventions to bring mind-set changes required in transiting from the past focus on irrigated, chemical intensive agriculture. The recent ICAR network project on National Initiative on Climate Resilient Agriculture (NICRA) provides some insights on requirements of adaptation. NMSA can collaborate with ICAR on specific matters regarding adaptation to climate change. The key to this is a paradigm shift that moves towards a knowledge-based, farmer centric and institutionally supported system where the Government is prime mover and facilitator to demonstrate at scale the overall strength and impact of rain-fed agriculture packages that have slowly emerged through several years of grass-roots work by Government and civil society organisations and have shown the strength of combining water and other interventions at a micro-level. The starting point of NMSA must be an accurate assessment of the natural resource, comprising water, land, climate and biodiversity, which determine the opportunities for livelihoods of the people.

(E) Design of NMSA

12.169. While the decision to launch the National Mission for Sustainable Agriculture (NMSA) is quite historical, there are design issues both in view of the fact that the Ministry of Agriculture no longer has a watershed development component in its programmes and because there are strong differences on the matter of fertiliser and pesticides use. While the current National Mission on Micro-Irrigation, the National Project on Management of Soil Health and Fertility and the Rainfed Areas Development Programme (RADP) window in RKVY can be merged with NMSA, none of these address fully the issues that have been raised by the Twelfth Plan Working Group on Natural Resources Management and Rainfed Farming. Its main recommendation is to observe the following:

1. Focus on stabilising and securing diverse cropping by bringing a focus on 'Rainfall Use Efficiency' as central to policy as against mere

use efficiency of applied water. This shift calls for two major focal areas:

- a. Promote measures for in-situ conservation and efficient use of rainwater
 - b. Invest in shared and protective/supportive irrigation
2. Harness the inclusive growth potential in the so far untapped Agronomic and Management Innovations that are aligned to enhancing sustainability of natural resources, reducing costs, increasing efficiency of resource use and improving total factor productivity. System of Rice Intensification and non-pesticidal management (NPM) of pests as mentioned in the Approach Paper and options evolving in conservation agriculture are some examples.
 3. Strengthen the extensive livestock systems depending wholly or partly on commons and agriculture residues through intensive efforts in improving health care, feed, fodder, drinking water, shelter, institutions and so on. The domain of public policy and intervention must shift to these from the present almost exclusive focus on high yielding breeds.
 4. Invest in decentralised and local institutional capacities that enable a shift away from one-time Planning to 'iterative Planning—implementation—learning cycles' anchored by local institutions.
 5. Enhance institutional capacities in local governance and resource management, particularly related to Commons and strengthen Panchayat Raj, cooperatives and other stakeholder institutions. Such institutional base is a prerequisite for evolving location and agro-ecology specific mechanisms of programme designing, credit access, filling in infrastructure gaps, marketing and so on.

12.170. The specific recommendations of this working group, including the setting up of a National programme on rain-fed farming, could be another component of NMSA, financed by resources currently expended under the scheme of Macro-management in agriculture which housed the

watershed development schemes of DAC and will now have to be wound up. This component could mainstream the learning that has emerged from the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) along with ICAR's National Initiative on Climate Resilient Agriculture (NICRA).

PLAN FINANCING

Expenditure on Agriculture and Allied Sectors

12.171. During the Eleventh Five Year Plan, a combined Plan outlay of ₹1,36,381 crore (at 2006–07 prices) by the Centre, States and UTs was envisaged for the agriculture and allied sectors. The realisation is estimated to be ₹1,30,076 crore at 2006–07 prices, that is, 95 per cent of projected Plan. The priority to agriculture and allied sectors in allocation of resources in the combined Plan of Centre, States and UTs has been around 5.6 per cent in the Eleventh Plan, an improvement over 3.6 per cent during the Tenth Plan. At present about 50 per cent of the agriculture and allied sectors plan in the country is being financed by the Centre, including expenditure on Rashtriya Krishi Vikas Yojana (RKVY).

FINANCIAL PERFORMANCE OF THE MINISTRY OF AGRICULTURE

12.172. Table 12.11 gives the outlay and expenditures of the MoA and its three departments, DAC, DAHDF) and Department of Agricultural Research and Education (DARE), which implement plans and

programmes for development of agriculture and allied sectors. The Ministry is likely to realise 88 per cent of the outlay at current prices. A noticeable feature is that RKVY, which was initiated in 2007–08, accounted for 38 per cent of MoA's total plan expenditure in 2011–12(RE).

12.173. DAC with utilisation of around 94 per cent of projected outlay for Eleventh Plan at current prices has shown a better performance. The NHM fell short of targets mainly on account of below par performance in grounding the Terminal Market Complexes. The NFSM and horticultural programmes except NHM have achieved the envisaged financial targets and expenditure on agricultural insurance exceeded the Eleventh Plan projection because of demands arising from the drought of 2009. DAHDF incurred major shortfall in the Plan expenditure. One of the reasons for this was the attempt to introduce a large number of schemes with small outlays during Eleventh Plan which faced problems in their conceptualisation, formulation and approval at various stages. Inadequate staff in the State implementing Departments and resulting limitations on absorption capacity of the States to implement the programmes has also been responsible for the shortfall. Both DAC and DAHDF also transferred increasing amounts through State/District level autonomous bodies, which will need to be avoided in future since this limits the capacity of States to plan comprehensively for agriculture development. Plan realisation is expected to be around 77 per cent in the case of DARE.

TABLE 12.11
Outlays and Expenditure of MoA and Its Three Departments (DAC, DAHDF and DARE)

	DAC	DAHDF	DARE	RKVY	WDPSA	Total
Eleventh Plan proposed (Current Prices)	41,337	8,174	12,588	25,000	240	87,339
2007–08 Actual	5,769	782	1,280	1,247	40	9,118
2008–09 Actual	6,545	865	1,630	2,887	39	11,966
2009–10 Actual	6,827	871	1,707	3,761	40	13,206
2010–11 Actual	10,208	1,096	2,522	6,720	40	20,585
2011–12(RE)	8,654	1,357	2,850	7,811	50	20,722
Total Eleventh Plan Actual	38,003	4,970	9,989	22,426	209	75,597
% utilisation during Eleventh Plan	92	61	79	90	87	87

RASHTRIYA KRISHI VIKAS YOJANA

12.174. The National Development Council (NDC), in its meeting held on 29 May 2007 resolved to initiate a special Additional Central Assistance Scheme viz. Rashtriya Krishi Vikas Yojana (RKVY). The purpose behind this programme was to encourage States to draw up District and State agricultural plans and also increase their own spending on the sector so as to reorient agricultural development strategies for rejuvenating Indian agriculture during the Eleventh Plan (2007–12). RKVY is preferred by States for its inbuilt flexibility in selecting interventions and setting State specific targets.

12.175. One objective of RKVY during the Eleventh Five Year Plan was incentivising States to increase expenditure on agriculture and allied sectors. State plan expenditures (excluding RKVY receipts) as percentage of GDP in agricultural and allied increased from 1.0 per cent in the Tenth Plan to 1.4 per cent in the Eleventh Plan. State plan expenditures on agriculture and allied sectors (excluding RKVY) have also increased as percentage total plan spending by States, from about 5 per cent during the Tenth Plan to over 6 per cent during the Eleventh Plan. RKVY was therefore successful in motivating States to pay greater attention to agriculture, besides providing increased Central assistance for the sector.

12.176. RKVY as assistance was particularly useful for the funds-starved animal husbandry, dairying and fisheries sectors. Projects amounting to over ₹5,000 crore were sanctioned under RKVY for these sectors during the Eleventh Plan, about 20 per cent of the total sanctioned RKVY projects, and more than spending on DAHDF's schemes. This has provided a substantial push to these sectors which account for a significant contribution to the agricultural GDP.

12.177. However, preparation of Comprehensive District Agriculture Plans (C-DAPs) has been a weak area in many states, partly due to lack of capacity at District/State level. Although there are reservations regarding quality and effective capability of district level planning and project design, this was an original NDC intention and must be fully implemented during the Twelfth Plan. At least 25 per cent of projects sanctioned by SLSCs should originate from

the district level, preferably approved by District Planning Committees. For the purpose, suitable units will have to be formed involving ATMA/KVK/SAU and any other technical support unit that States may specify. As mentioned earlier, it is necessary to see decentralised planning as an iterative planning—doing—learning—planning cycle rather than simply a one-time activity. The challenge is to institutionalise this process and ensure that the agency facilitating planning is also accountable for the outcome.

12.178. Further, while there is very strong anecdotal evidence of the early success of RKVY, a detailed impact assessment of the scheme is needed for further experience and learning. Moreover, two modifications are desirable in the present practice. First, there should be a proper committee to examine and vet all projects proposed to the SLSC. Second, that at least this vetting committee or even the SLSC work closely with, and preferably be coterminous with, State level bodies that select MoRD projects, particularly for watershed development. This would permit better convergence and better project selection.

12.179. Many States have requested changes in the allocation criteria of RKVY and some have objected to opening of new windows within the RKVY. A decision has been taken that no more than 20 per cent of RKVY funding will be in such windows of national importance. A decision has also been taken that at least 40 per cent of RKVY spending should be on hard infrastructure spending. A meeting of all States will be held to discuss proposals for changes in allocation criteria.

12.180. Finally, future RKVY design needs to be seen in the context of many pending key reforms. Despite efforts by the Central Government, progress in agricultural marketing, extension and cooperative reforms continue to be sluggish. Delivery of services has not been efficient due to lack of staff at various levels. State Agricultural Universities (SAUs) need greater funding support from the State Governments. Inadequacy of agricultural infrastructure hampers achievement of growth potential of the agriculture sector. During the Twelfth Plan RKVY will need to be reoriented to facilitate such market reforms, higher expenditure on SAUs and for infrastructure

development, besides emphasising effective formulation and implementation of District Agriculture Plans. These could be incorporated by changing the current eligibility conditions and allocation formula for RKVY. The proposed meeting of all States as mentioned above will need to be held before these changes in RKVY are proposed to Cabinet.

AGRICULTURAL STATISTICS

12.181. Statistics are the hard input into planning. There are numerous gaps in agricultural statistics hampering the agricultural development planning some of which include reliable and timely availability of forecasts of agricultural crops especially foodgrains, reliable statistics for small areas like blocks and Panchayats, estimates of agricultural production losses due to pests, diseases, floods and drought, good estimates of production of minor crops including spices, condiments, medicinal plants, floriculture and so on, estimates of requirement of foodgrains for seed, feed and industrial use, harvest and post-harvest losses in agricultural production and estimates of meat production. Further, the available estimates generated through sample surveys suffer from organisational and operational problems bringing in inconsistency in these surveys.

12.182. The Vaidyanathan Committee has recommended setting up a National Centre for Crop Statistics, independent of the present system, for providing reliable quick estimates at the National and State level. This should have high priority since not only are there strong doubts about quality of present data among experts, the large increase in number of crop-cutting experiments for insurance purposes may further vitiate the system. An independent source of high-quality data is vital for improving the quality of agricultural statistics in India.

12.183. The existing database relating to horticulture sector needs to be strengthened as mentioned earlier in the horticulture section. Cost of production data for animal husbandry products also needs improvement. Development of appropriate methodology for estimation of feed consumed by live-stock will help in updating ratios currently used by the National Accounts Division. Similarly, the

existing methodology for generation of fishery statistics needs fine tuning.

12.184. For ascertaining the reliability of land use statistics in the context of diversion of agriculture land to other uses for residential, industrial, urbanisation, roads and so on, there is a need for conducting a study for checking the land records through khasra registers/other records of those villages where the area have come under diversion of agriculture land to non-agriculture uses particularly in the vicinity of the metropolitan cities.

12.185. Pilot studies need to be undertaken for perfecting remote sensing techniques and GIS/GPS tools to develop reliable estimates of area under agro-forestry area under crop production, land-use planning, land development and precision farming and so on.

12.186. All in all, the Twelfth Plan objective is to continue with the decentralisation thrust of RKVY, while reducing number of Centrally Sponsored Schemes. As discussed in relevant sections above, this vision on decentralisation could extend to fertiliser and food subsidies also. While doing this, the main Twelfth plan foci are:

- Bringing scale through development of Farmer Producer Organisations
- Emphasising technology, both on the research and development sides
- Stressing standards and protocols and standard operating procedures in every scheme
- Improving statistics and evaluation
- Initiating a shift towards sustainable and climate-resilient agriculture, not only through NMSA but more generally by laying emphasis on rain-fed areas and bringing about shifts of water-intensive rice cultivation from water-stressed North-West India to Eastern India.
- Preparing for faster growth through a more diversified agriculture, with investment in the necessary modern infrastructure required for perishable products.

12.187. As shown in Table 12.13, States have indicated that they will more than double their plan

expenditure on agriculture and allied sectors from ₹1,11,824 crore during the Eleventh plan to ₹2,26,500 crore during the Twelfth Plan. The Centre shall also more than double its plan expenditure. The allocation for RKVY is being raised to ₹63,246 crore for the Twelfth Plan from actual expenditure of ₹22,426

during the Eleventh Plan. The indicative Twelfth Plan Gross Budgetary Support (GBS) for all other schemes of the MoA is ₹1,11,232 crore. This is against corresponding the Eleventh Plan actual expenditure of ₹53,171 crore. Refer to Table 12.12 for department-wise break-up, excluding RKVY:

TABLE 12.12
Gross Budgetary Support (Department-wise)

Department	Gross Budgetary Support (GBS) (₹ Crore)
Department of Agriculture and Cooperation (DAC)	71,500
Department of Agriculture and Research Education (DARE)	25,553
Department of Animal Husbandry, Dairying and Fisheries (DAHDF)	14,179

TABLE 12.13
Comparison of States Outlay and Expenditure for Eleventh and Twelfth Plan

(₹ in crore at current prices)

Name of State	Eleventh Plan Outlay		Eleventh Plan Expenditure		Twelfth Plan Outlay		Increase in Twelfth Plan over Eleventh Plan Expend. (%)
	Agriculture and Allied Sector	% of Total Plan	Agriculture and Allied Sector	% of Total Plan	Agriculture and Allied Sector	% of Total Plan	
Andhra Pradesh	3,487.44	2.4	9,510.46	6.0	17,138	5.0	80
Arunachal Pradesh	752	9.5	617.71	5.7	1,114	5.3	80
Assam	877.86	2.1	2,335.56	7.8	3,272	5.9	40
Bihar	3,672.73	4.8	4,805.33	6.3	15,613	6.0	225
Chhattisgarh	4,613	8.6	5,637	12.7	8,284	6.9	47
Goa	211.76	2.5	325.39	3.6	1,046	3.9	221
Gujarat	9,092.94	0.7	8,879.8	6.9	19,712	7.8	122
Haryana	1,638.82	4.7	2,733.02	5.7	6,288	5.4	130
Himachal Pradesh	1,470.08	10.7	1,642.82	12.1	2,174	9.7	32
Jammu & Kashmir	1,818.21	7.0	892.98	3.5	2,843	9.7	218
Jharkhand	3,130.53	7.8	2,319.85	5.9	4,157	3.8	79
Karnataka	8,426.85	8.3	10,484.4	7.7	19,824	8.9	89
Kerala	2,649.11	7.8	2,931.54	7.6	8,831	11.5	201
Madhya Pradesh	3,408.18	4.8	6,057.09	7.3	17,076	8.5	182
Maharashtra	9,507.64	5.9	10,636.4	7.3	19,325	7.03	82
Manipur	386.55	4.7	234.04	3.2	643	3.1	175
Meghalaya	735.52	8.0	845.2	9.8	2,114	10.7	150
Mizoram	536.31	9.6	387.86	7.1	346	2.8	
Orissa	1,230.29	3.8	3,580.37	8.2	8,387	7.4	134
Nagaland	434.31	8.3	725.08	11.3	1,795	13.8	148
Punjab	1,309.13	4.5	1,410.77	4.0	1,524	2.9	8
Rajasthan	2,919.07	4.1	5,990.67	6.2	7,255	5.6	21
Sikkim	260.43	6.9	228.27	6.4	469	4.1	106
Tamil Nadu	7,831.57	9.2	8,170.01	8.8	20,680	10.0	153
Tripura	798.51	9.0	858.79	11.3	980	6.8	14
Uttar Pradesh	19,146.37	10.6	14,164.8	7.8	24,354	8.5	72
Uttarakhand	2,478.5	8.4	2,079.25	10.0	2,673	5.9	29
West Bengal	1,846.50	2.9	3,339.26	5.1	8,583	5.5	157
Total States	94,670.21	3.6	1,11,824	7.2	2,26,500	7.1	103

13

Industry

13.1. India has become one of the fastest growing economies in the world over the last two decades, undoubtedly aided in this performance by economic reforms. The striking aspect of India's recent growth has been the dynamism of the service sector, while, in contrast, manufacturing has been much less robust, contrary to the experience in other emerging market countries, where manufacturing has grown much faster than GDP; this has not happened in India. Consequently, manufacturing sector's contribution to the GDP has stagnated at 16 per cent, raising questions about India's development strategy, especially its implications for generating adequate employment. Additionally, employment in manufacturing declined in absolute terms from 55mn to 50mn between 2004 and 2005 and 2009–10, after having grown by 25 per cent between 1999 and 2000 (44mn) to 2004–05 (55mn).

13.2. The Eleventh Plan period was marked by unfavourable global economic conditions brought on by the financial sector crisis of 2007–09 followed by the risks of sovereign debt crisis mid-2011 onwards. While this led to slackening demand, exchange-rate volatility and economic uncertainty, domestic difficulties such as poor implementation and delayed reforms also slowed the growth of the Indian manufacturing sector. The year 2009–10 witnessed a fleeting return of manufacturing buoyancy largely on account of a few sectors such as the automotive sector along with a revival in cotton textiles, leather and food products. This brief spurt, however, has now moderated. The net result is that the share of the manufacturing sector in the country's GDP

continued to be stagnant, a trend now observed for nearly three decades and remained relatively lower than other emerging and developed economies (refer to Figure 13.1).

13.3. Further, India was not able to fully leverage the opportunities provided by the dynamics of globalisation that resulted in a dramatic shift of manufacturing to developing countries over the last decade. The increasing gap in both, the sectoral share of manufacturing and the competitiveness of the manufacturing sector in India, compared with countries, such as China, is testimony of that (Figure 13.2).

13.4. This shift of manufacturing capacities from developed nations to rapidly developing economies (RDEs) is likely to continue. It is estimated that by 2025 RDE production will account for over 55 per cent of global production compared to 36 per cent presently. Hence, India's ability to capitalise on this by capturing a disproportionate share of such a shift in global economic setting through an accelerated growth rate will be imperative.

PERFORMANCE REVIEW OF THE MANUFACTURING SECTOR

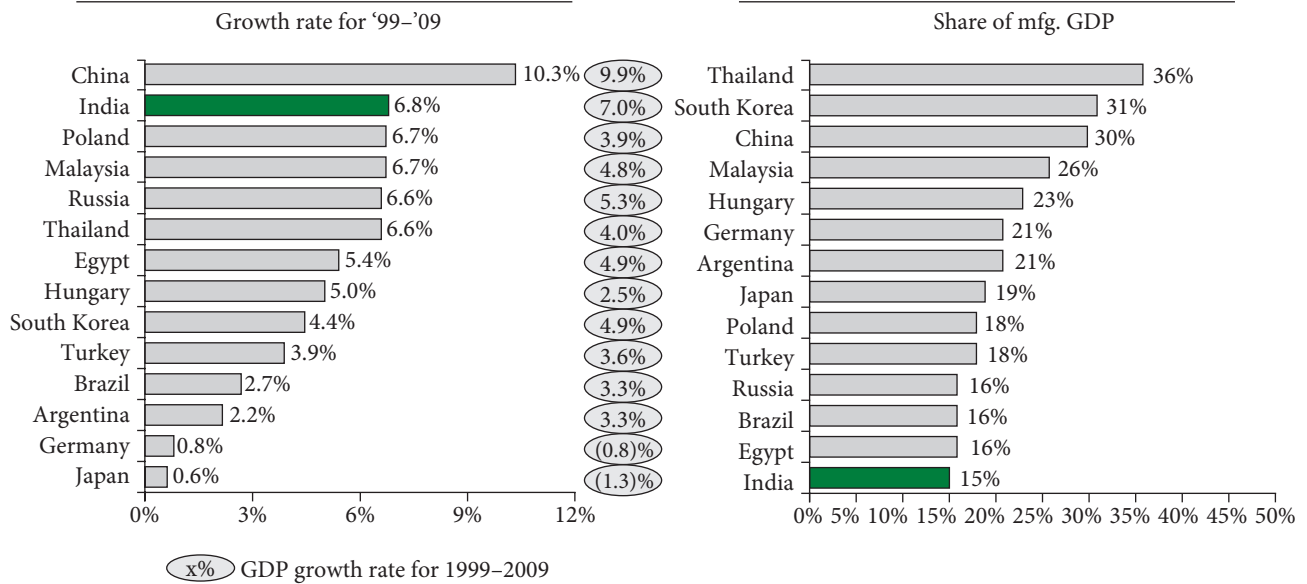
Growth Rate

13.5. The manufacturing sector averaged a growth of 7.7 per cent (till 2009–10) during the Eleventh Plan (refer to Table 13.1). Growth peaked at 14.3 per cent in 2007–08 and then started decelerating. The decline in manufacturing growth was primarily responsible for the slowdown in GDP in 2011–12.

Manufacturing needs to grow at higher than GDP growth to capture better share of GDP

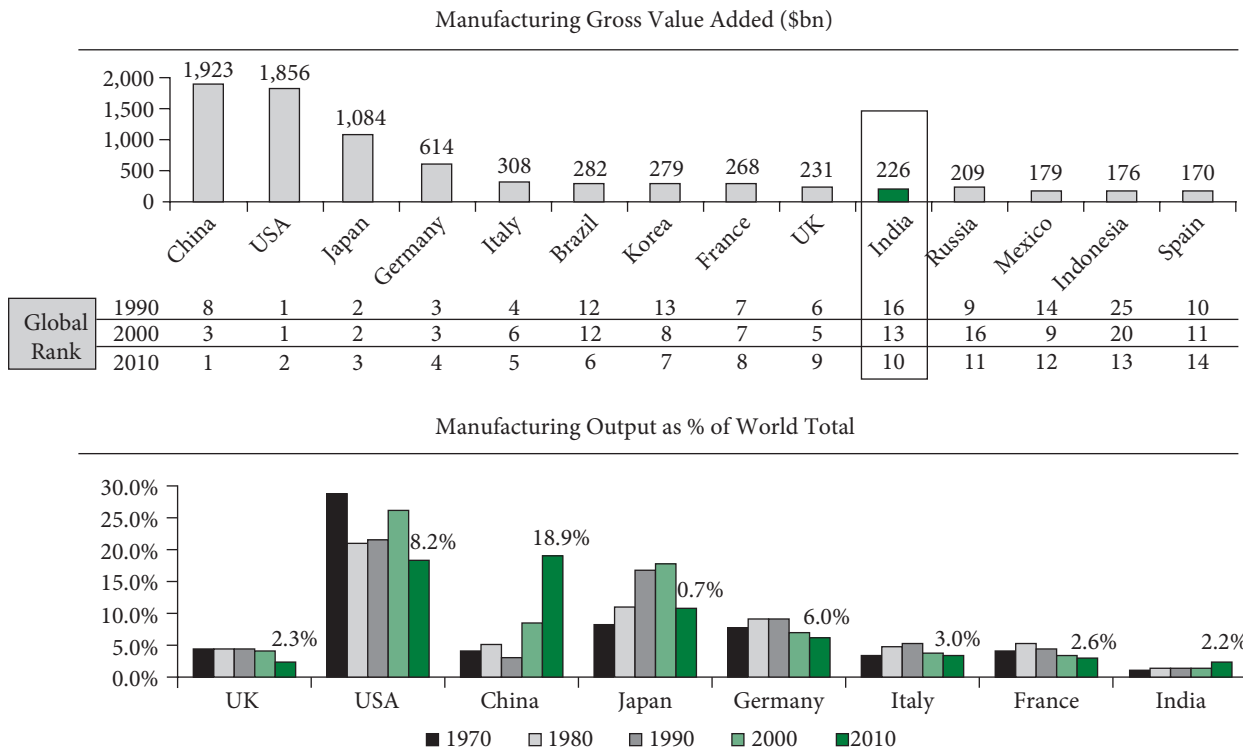
Manufacturing GDP Growth for most Countries higher than GDP Growth

Share of manufacturing GDP in India is low at ~15% when compared to other economies



Source: Economic intelligence Unit, Data Monitor, Euro-monitor, World Bank Work Development Indicators, BCG analysis.

FIGURE 13.1: Contribution of Manufacturing to GDP Very Low in India



Source: UN National Accounts Main Aggregates Database.

FIGURE 13.2: India and Global Manufacturing States

Initial deceleration in industrial growth was largely on account of the global economic meltdown. Fragile economic recovery in US and European countries, and subdued business sentiments affected the growth of the manufacturing sector. Rising interest rates and appreciation of the rupee during the Eleventh Plan period also contributed to this slow down. It is significant to note though, that volatility of manufacturing growth has become more pronounced over the last five years. An important implication of this is the need for greater flexibility both in policy and non-policy factors which have a bearing on the manufacturing sector.

Investment

13.6. Investment and capacity additions are critical for sustained industrial growth. National accounts data clearly indicate a moderation in the growth of gross capital formation (GCF) in industry (Table 13.2). The rate of growth of GCF in four broad sectors of

industry comprising mining, manufacturing, electricity and construction averaged 10.9 per cent during 2004–11, almost the same as the rate of growth of GCF in the economy as a whole. For manufacturing to grow faster than other sectors in the economy, rate of GCF in manufacturing will have to be higher.

Employment

13.7. Employment in manufacturing increased from 44 million to nearly 56 million between 2000–01 and 2004–05. However, employment in manufacturing reduced by 5 million between 2004–05 and 2009–10 (Table 13.3). The net increase in employment over the decade 2000–01 to 2009–10 was around 6 million, that is, a 13 per cent increase over 10 years. Manufacturing in India contributes to only ~11 per cent of total employment. This compares unfavourably to other emerging economies where the share of employment in manufacturing range from 15 per cent to 30 per cent.

TABLE 13.1
Rate of Growth of GDP at Factor Cost at 2004–05 Prices (Per cent)

	2007–08	2008–09	2009–10PE	2010–11 QE	2011–12 AE
Agriculture, Forestry and Fishing	5.8	0.1	1	7	2.5
Industry	9.7	4.4	8.4	7.2	3.9
Mining and Quarrying	3.7	2.1	6.3	5	-2.2
Manufacturing	10.3	4.3	9.7	7.6	3.9
Electricity, Gas and Water Supply	8.3	4.6	6.3	3	8.3
Construction	10.8	5.3	7	8	4.8
Services	10.3	10	10.5	9.3	9.4
GDP at Factor Cost	9.3	6.7	8.4	8.4	6.9

Source: CSO.

TABLE 13.2
GCF in Industry

	(₹ Crore at 2004–05 Prices)							
	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	CAGR (Eleventh Plan*)
Mining	37,322	52,259	60,456	68,372	57,045	65,984	70,389	3.9%
Manufacturing	3,44,517	4,04,928	4,74,405	6,11,928	4,20,506	5,98,445	6,40,982	7.8%
Construction	54,445	57,531	95,799	1,15,157	88,523	86,290	98,426	0.68%
Total Industry	4,89,584	5,79,391	7,07,029	8,81,464	6,65,067	8,52,999	9,13,051	6.6%
Share of GCF in Industry as % to Total GCF	48.4	49	51.8	54.9	42.5	49.6	48.3	

Source: Economic Survey 2011–12; *CAGR has been calculated for a period of four years.

TABLE 13.3
Employment by Sector

Sectors	(in Millions)		
	1999–2000	2004–05	2009–10
Agriculture	237.67	258.93	244.85
Manufacturing	44.05	55.77	50.74
Mining	2.17	2.64	2.95
Electricity, Gas and Water Supply	1.13	1.3	1.25
Construction	17.54	26.02	44.04
Services	94.2	112.81	116.34
Total	396.76	457.46	460.22

Source: Planning Commission.

13.8. One hundred and eighty-three million additional income seekers are expected to join the workforce over the next 15 years. Agriculture cannot be expected to provide more jobs. Manufacturing must provide a large portion of the additional employment opportunities required for India's increasing number of job seekers. Unless manufacturing becomes an engine of growth, providing at least 70 million additional jobs, it will be difficult for India's growth to be inclusive. Since the pattern of development of the manufacturing sector so far has not delivered the desired growth in output and employment, a change in strategy is required. This Plan is a description of the strategy, and the process for its implementation, without which the national objectives cannot be achieved.

OBJECTIVES FOR THE TWELFTH PLAN AND BEYOND

13.9. In order to create a paradigm shift in the manufacturing sector, it is essential to consider the objectives over a longer timeframe, such as 15 years. The National Manufacturing Policy, which was introduced in 2011, states these objectives and these are the underlying objectives that the Plan aims to achieve as well. These objectives are:

1. Increase manufacturing sector growth to 12–14 per cent over the medium term to make it the engine of growth for the economy. The 2 to 4 per cent differential over the medium term growth rate of the overall economy will enable manufacturing

to contribute at least 25 per cent of the national GDP by 2025.

2. Increase the rate of job creation in manufacturing to create 100 million additional jobs by 2025. Emphasis should be given to creation of appropriate skill sets among the rural migrant and urban poor to make growth inclusive.
3. Increase 'depth' in manufacturing, with focus on the level of domestic value addition, to address the national strategic requirements.
4. Enhance global competitiveness of Indian manufacturing through appropriate policy support.
5. Ensure sustainability of growth, particularly with regard to the environment.

REALISATION OF OBJECTIVES NEEDS A PARADIGM SHIFT

13.10. The Eleventh Five Year Plan as well as Plans that preceded it aimed at establishing a strong manufacturing sector but this has not happened. This suggests that a radical change in the policy approach is needed.

13.11. Comparison with the performance of other countries shows that the countries that managed to catch up with the earlier industrialised, high-income countries were the ones whose governments proactively promoted structural change. Industrial policy, and with a special focus on manufacturing, is back on the national agendas of many countries and we need to consider what lesson we can draw given our particular circumstances. In other words, the critical question now is not whether there should be an industrial policy but what should be the architecture of the industrial policy.

13.12. Industrial policies, where they have succeeded, have generally not been an outcome of Centrally planned economies but of economies that have had the active involvement of private enterprises and other non-governmental stakeholders. Successful strategies evolve from ongoing productive interactions between government and producers. Therefore, the government must improve the process of interaction, collaboration and learning amongst producers and itself. This is very different from the paradigm of Indian industrial policy

prior to India’s economic reforms commencing in the 1980s. In that era, industrial planning was a top-down control activity with Government determining who should produce what, where and how much and also what technology they should use. The roadmap for the Twelfth Plan and beyond can definitely not be a return to this type of planning.

Nature of Industrial Policy

The Question of ‘Industrial Policy’

13.13. The Government of India needs a strategy to accelerate the growth of the country’s manufacturing and industrial sectors to meet the goals and obtain the outcomes mentioned. The concept of ‘industrial policy’ has varied across countries and also over time. In India, industrial policy becomes assaulted under a stifling system of bureaucratic controls through licenses and quotas for industrial production. There is no doubt that these controls were highly dysfunctional and needed to be dismantled but the mere removal of these controls and reliance on markets alone was not sufficient. The collapse of the Soviet Union and the ascendancy of Western free-market approaches to economic growth which was fashionable for a time in the 1990s implied abandonment of any concept of ‘industrial policy’ altogether. However, this is not the recipe which delivered rapid industrial growth for many of the post-war success

stories, whether we think of Japan or Korea or, more recently, China. In planning a strategy for rapid growth of industry in India we need to learn from these success stories and apply them suitably to our circumstances.

Paradigms of Industrial Policy

13.14. Countries that have succeeded in growing the competitiveness and scale of their manufacturing sectors have adopted different policy approaches. However, a common element in their approaches has been a close coordination between producers and government policymakers, with Governments playing an active role in providing incentives for domestic industrial growth and in relieving constraints on industrial competitiveness. The process by which this coordination has been achieved has differed according to the political structure of each country’s economy (Figure 13.3). In Japan the coordination between Government and industry (and within Government) was very successfully orchestrated by MITI in partnership with Japanese industrial associations. In South Korea, the Chaebol and the Government collaborated to create world-class and world-scale winners. In Singapore, the Government identified industries to be developed and created ecosystems (skilled human resources, tax regime, Government incentives and so on) to support growth of competitive enterprises in the country. In China,

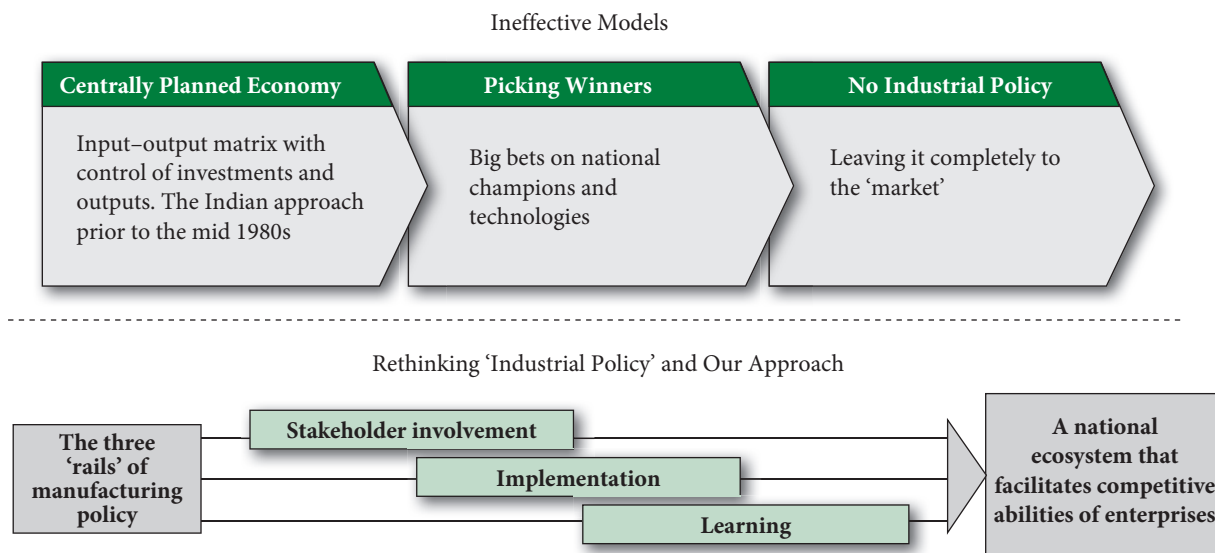


FIGURE 13.3: New Approach to Industrial Policy

the large State Owned Enterprise (SOE) sector has enabled the Chinese Government to adopt a very muscular ‘industrial policy’. Along with preferential treatment to domestic companies, large investments in technology development/acquisition, massive investments in infrastructure and restraints on its exchange rate, China’s industrial policy has been remarkably successful. Germany’s manufacturing sector remains very successful in spite of high labour costs and a strong currency because collaboration between stakeholders in the German industrial system is deeply embedded in policymaking processes and also within industrial enterprises.

13.15. A deeper analysis of such successes (Japan, Korea, China and Germany) of ‘industrial policy’ and also of its failures (India, the Soviet Union and some instances in Latin America) reveals the essence of successful industrial policy. Firstly, ‘industrial policy’ is a web of ongoing changes that facilitates the growth of a competitive industrial/manufacturing ecosystem in the country. Secondly, Governments have a key role in facilitating the process of learning and collaboration between producers and policymakers. Thirdly, and this is key, it is the quality of this process of collaboration and the speed of learning and execution in the system that enables the system to improve its competitiveness faster than other countries’ systems. Government policymakers must have the skills and orientation to facilitate and coordinate, rather than to control. Industrial policy will not produce a competitive manufacturing ecosystem if the orientation of the Government and its functionaries is to control and micro-manage. It will also fail if Government and its functionaries do not master the skills and build institutional capabilities for better coordination within Government, smoother collaboration with industry (which must be organised in line with the industrial–political economy of the country, as mentioned before) and, above all, faster learning.

13.16. The paradigm we must adopt is to build an ecosystem for rapid learning and capability building, which will encourage entrepreneurship and support innovation, and which will provide the system-wide processes to support collaboration and build stronger

value chains with depth. This paradigm requires a change in the mindset of Government functionaries from being ‘controllers’ to ‘facilitators’, from ‘resource allocators’ to ‘knowledge managers’ and from ‘scheme managers’ to ‘continuous learners’.

Essential Features of a Manufacturing Ecosystem that Learns

13.17. A dynamic manufacturing ecosystem has three features that enable it to learn and grow.

1. Firstly, it must have depth (value addition) in manufacturing processes. A manufacturing sector, no matter how large, that is composed mostly of low value addition assembly industries, cannot create new technological capabilities. It may compete on low costs on account of scale and low labour costs, but it can easily lose these advantages to other countries which have even lower labour costs. Also, merely having R&D capabilities, without the wherewithal around them to convert ideas into manufactured products will not enable the growth of manufacturing industries.
2. Second, it must combine four capabilities: human skills, embodied technology in hardware, knowledge (intellectual property) and a large and demanding customer base. All four components grow together to create a productive and competitive industry.
3. Third, it must have a range of different sized firms, especially small and medium sized ones. Small firms provide the first stages for skill development. They take up larger numbers of people into the industrial workforce with less capital investment, and they provide nurseries for experimentation too. Some of these small firms can grow into specialised, internationally competitive, medium sized firms. Such firms are the backbone of the German industry, and also the strength of India’s internationally recognised automotive component, pharmaceutical and IT sectors.

13.18. Firms operating in such an ecosystem would be able to flourish in an open competitive global economy. While there is a case for special support for strategically chosen industries for a limited

period, the only way the industry can demonstrate competitiveness is to be able to export to global markets within a defined period.

13.19. In addition to the three features described above, there are five processes that enable the ecosystem to learn.

- Firstly, learning is accelerated through *the interaction of the diverse components of the system*: R&D with producers, both with customers, producers with institutes for skill development, and interactions amongst adjacent sectors and technologies that spur new combinations and innovations. Thus complexity breeds further technological development and growth. This requirement translates into the strategies for building clusters, and linking research and development institutes with *producers*.
- Second is the process of Innovation. Innovation can be spurred by several enablers that create ‘safe-failing’ spaces for experimentation. These enablers include early stage risk capital, incubators and quick exit/bankruptcy laws. Analysis reveals that the Indian industrial ecosystem has inadequate support systems for experimentation and innovation.
- Third is a regime of Standards. Standards are an embodied learning of the ecosystem. They enable firms, small ones in particular, with a base of knowledge, and also act as means to reduce transaction costs with their customers and suppliers, domestically and globally.
- Fourth is an IP regime. Like Standards, a good IP regime provides a base of knowledge for researchers and producers to develop upon further without having to reinvent the wheel. An IP regime also provides incentives for taking risks by assuring rewards.
- The fifth category of processes that enable system-wide learning and continuing improvement are a class of processes such as total quality management, total productive maintenance, business excellence and so on. In fact, such processes have been the foundations for the rapid, country-wide growth of productivity and competitiveness of the Japanese and Korean industry. The power of

such processes has been realised by some sectors of Indian industry too, such as the auto industry, steel industry and so on.

The Architecture of a Strategy to Accelerate Growth of Manufacturing

13.20. Manufacturing enterprises, unlike IT and financial services enterprises, involve the production and movement of material goods. They, therefore, require good physical infrastructure to be competitive and this means improving transportation, uninterrupted power and adequate land to build. Moreover, the materiality of manufacturing activities also results in more regulations—of safety, pollution, factory inspections, labour conditions—and hence a more complex administration structure too. The quality and efficiency of the physical and administrative infrastructure is a basic requirement for productive manufacturing enterprises. This is a major weakness in India at present. The thrust in Government’s New Manufacturing Policy (2011) to create good infrastructure for manufacturing enterprises along transportation corridors is, therefore, overdue.

13.21. Good physical infrastructure and smoothly functioning administrative infrastructure are threshold requirements for Twenty-first century manufacturing enterprises to compete in the international arena. However, these will not be sufficient. Competitive manufacturing, requires the development of complex capabilities—technologies, skills and management abilities to coordinate diverse interactions and processes of learning. Such capabilities can be learned and improved. Continuous improvement in these capabilities is the key to sustainable competitive advantage, even absent advantages from raw materials required for manufacturing, as Japan and Korea have demonstrated. Therefore, the thrust of Government strategy must be on the enrichment of the composition of these capabilities in the country’s manufacturing ecosystem.

Three Components of India’s Manufacturing Strategy and Plan

13.22. India’s Manufacturing Plan strategy in the Twelfth Plan must be built around three components. The first are **capabilities and processes** that

go across many, if not all sectors of manufacturing, and that build into the ecosystem the processes for rapid learning and building of capabilities.

13.23. The second component has to be the plans to **strengthen the performance of selected sectors**. The selection of these sectors is done by a combination of top-down and bottom-up analysis. From the top, certain sectors appear more important to meet the goals of the Plan for more employment, for example, to produce goods that India needs for its strategic security. On the other hand, the capabilities created by Indian entrepreneurs in some sectors provide potential for more growth, and they should be supported. For example, the pharmaceutical and auto parts sectors. Thus the Plan, at present, has identified 18 such sectors.

13.24. India's sectoral strategy has to be broad-based, covering many sectors, to achieve the large-scale growth that India needs in manufacturing. India cannot achieve its goals by 'picking winners'. In each of these sectors, a sector strategy is required to grow capabilities and relieve constraints. Such sector strategies should be formulated jointly by the associations of producers in the sector (and other principal stakeholders too) and the relevant Government department. They should describe the opportunity for the sector and the actions required from the producers themselves, along with support from Government policies.

13.25. The third, vital, component of the Strategy is the **institutional ability for effective consultation and collaboration** between producers and public policymakers and implementers and the systemic reform of existing systems and processes within the Government. The strength of this process has been found to be the common factor in the success stories of all countries that have built large, competitive manufacturing sectors.

13.26. Lack of coordination amongst government ministries, and the relatively poor quality of interaction between business associations and government—which is constrained by the competition amongst associations, and the orientation, by and

large, towards lobbying and financial sops—prevents improvement in the process of collaborative learning and capability building that India needs to grow its manufacturing sector.

13.27. The challenges to developing and implementing a cohesive manufacturing strategy in democratic India are many. Cohesion can be brought about through more effective coordination amongst agencies, and more effective consultation amongst stakeholders. Apart from this, the Government will also require specialised skills such as consensus building and programme management to manage this process. Government should consider a 'Backbone Organisation (BBO)' to facilitate this process.

ISSUE IDENTIFICATION AND STRATEGIES TO ADDRESS THE VARIOUS CROSS-CUTTING ISSUES

13.28. The focus of this Plan has specifically been on transforming the approach to align the varied stakeholders to a common national goal, instead of having silo-limited views on individual sectors and individual goals (Figure 13.4). In order to achieve this coordination between the various sectors, and to identify the underlying causes of the slow progress of manufacturing, a set of thematic 'cross-cutting' issues were identified in addition to the major sectors of manufacturing. The 'cross-cutting' issues affect the growth of manufacturing across sectors. They fall into two categories: one category is those issues that 'industry' ministries and industrial enterprises have responsibility to address, albeit in collaboration with other stakeholders; and the other category is those broader issues that affect the economy overall in which the responsibility primarily lies with other ministries.

13.29. In the first category is the weak development of human resources, of which a vast quantum is essential to achieve our goals. Another key issue, common to all sectors, is depth within the country of technology in the sector's supply chain. Yet another is a set of the infrastructural challenges, both physical and administrative, related to acquisition of land and water management, and the business regulatory framework, in which industry has a key role to play in developing and implementing solutions in consultation with

other stakeholders. These cross-cutting issues have been identified in the National Manufacturing Policy recently approved by the Cabinet. This Plan describes the actions to be taken in all these areas and a process for their implementation and monitoring.

13.30. The second category, that of external inputs to industry that affect the economy as a whole too, and which are managed outside industry, includes four principal constraints on the growth of manufacturing: transport infrastructure, power, cost and availability of credit, and the exchange rate. Transport infrastructure and power have a direct bearing on the competitiveness of manufacturing. Energy and logistics are critical requirements for competitive manufacturing operations. While significant investment were made in transportation infrastructure in the Eleventh Plan, Indian industries continue to suffer from severe infrastructure handicaps compared with the infrastructure available to manufacturers in other countries. Ports are already close to full-capacity utilisation resulting in extremely inefficient turnaround times and similarly roads suffer from congestion resulting in heightened costs. Unreliable

and inadequate power supply continues to be a serious impediment in India in spite of the considerable efforts made to enhance power generation capacity in the country. Improving the supply and quality of both transport infrastructure and power are essential requirements for attaining the targeted growth rates for manufacturing in the Twelfth Plan and beyond.

13.31. Adequate availability of low-cost credit is a vital requirement for sustainable manufacturing growth. Continued monetary tightening due to the recent turn of global events has resulted in a high cost of capital, adversely impacting manufacturing investment and growth in India. Cost of capital is key for ensuring competitiveness, especially of exports, of the manufacturing sector and needs to be carefully managed through a more balanced blend of fiscal and monetary measures. Specifically for MSME's, access to credit continues to remain a challenge and besides a host of measures to facilitate greater flow of credit to this segment detailed in Section 5, the overall pool of available capital needs to be enlarged to include alternate sources of capital such as private equity, venture capital and so on.

Focus given not only to 'vertical' sectors by also to 'horizontal' issues that cut across sectors

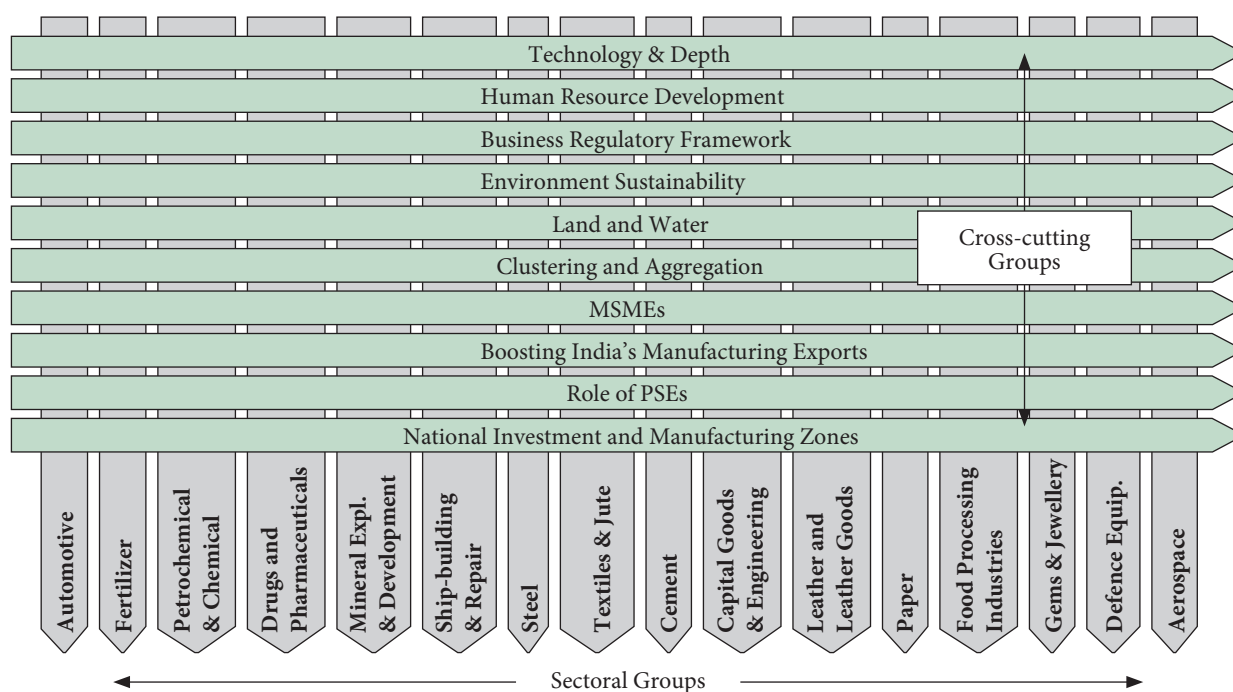


FIGURE 13.4: Focus on Sectors as well as Cross-cutting Issues

13.32. Finally, the exchange rate is an enormously important factor affecting the international competitiveness of a country's manufacturing sector. Large fluctuations in exchange rates can disrupt the management of supply chains. Monetary and fiscal authorities need to be cognisant of the impact that such fluctuations have on the growth of manufacturing.

TECHNOLOGY AND DEPTH

13.33. A principal objective of the Twelfth Plan must be to increase 'depth' in manufacturing, to increase domestic value addition, and meet national strategic requirements. The technological depth of the country's manufacturing sector goes up when it becomes an active player in more parts of the manufacturing value chain (research, development and production). Depth defined in these terms increases synergies across the value chain and also strengthens the overall trade position. It may be noted that depth is not necessarily required in all sectors. There is merit in being part of a global value chain but substantial part of industry must have technological depth.

13.34. Depth in technology is extremely important for a country to sustain its competitive advantage in a global economy. It is not only important from the point of view of greater value addition, but it is also required to attract new industries and maintain competitive advantage of current industries.

13.35. The key requirements for improving technology and depth are to:

- Provide an enabling environment for domestic enterprises to invest in technology creation, technology absorption and achieve higher value addition
- Ensure availability of demand for products developed and/or manufactured indigenously
- Provide enabling environment for foreign enterprises to invest in manufacturing and research activities in the country, in the areas in which the country needs foreign technology
- Mitigate the risks of MSMEs investing in technology development and technology upgradation

Status and Key Challenges

13.36. Lack of depth in technology is one of the foremost issues affecting the growth of manufacturing sector in the country. India's R&D spend is 0.9 per cent of GDP, whereas China, UK and Israel spent about 1.2 per cent, 1.7 per cent and 4.3 per cent, respectively. India needs to increase its R&D expenditure to improve its depth. The private sector finances 70 per cent of the total R&D spending of China, 65 per cent in United States and 75 per cent in Korea and Japan, while Indian private sector funds only 25 per cent of the total R&D spend. As majority of private sector funding of other countries is towards industrial R&D, Indian corporate sector needs to increase its spending on industrial R&D (see chapter on Science and Technology).

13.37. The key challenges faced by Indian industries are:

- The Indian Industry has not given sufficient importance to the documentation of knowledge and creation of IP. As a result, not only were opportunities lost to create IP, but we lost IPs to other countries, such as in traditional agricultural products (IPs filed by western countries on neem, turmeric and basmati rice, which India has contested). Our regulatory framework, speed of award of IPs and the enforcement of IP regulations needs improvement. India's approach on IP, hence, needs to distinguish between shaping the framework for IP creation and improving its IP management processes.
- Though there is an improvement in the industry-academia collaboration in creating patents/technologies, still there is a large scope for improvement.
- While FTAs signed with other countries are favourable for some products, they often create a distortion in the market in terms of inverted duty structure for other products.
- Many segments of the industry, especially MSMEs, have limited information and access to risk capital for sourcing/developing and internalising new technologies.
- The weak attention to standards not only invites dumping of sub-standard products by other

Box 13.1**Examples of Weak Domestic Standards Leading to Influx of Sub-standard Products in the Country****A) Absence of standards**

In the absence of technical standards, it becomes easy to import poor-quality products into the country. This hurts the domestic industry as the domestic industry is unable to match the price of these poor-quality products; it also exposes consumers to the harmful effects of spurious products. In the absence of such standards, it would not be possible to make such technical regulations which would curb import of poor-quality products. Some of the examples include mobile telephones, batteries for the mobile telephones, digital blood pressure measuring equipment, decorative lights (imported from China during Diwali festival), medical equipment and so on.

Mobile telephones: Lack of manufacturing standards and testing/sampling labs are prompting dumping by foreign manufacturers. For example, till 2009, there was no standard mandating all imported mobile phones to have an IMEI number. As a result, Chinese handsets without IMEI numbers had a market share of about 13 per cent at that time.

B) Lack of a clear framework for voluntary and mandatory compliances

In some situations, where Indian Standards exist for products or processes, the Central Government has not notified them for mandatory compliance.

Toys: Standards have been laid out for safety of toys such as quality of plastics and paints, electrical and mechanical hazards, migration of heavy elements (Lead, Cadmium) and so on. However it is not mandatory to comply with, and hence toys from other countries are being dumped in the Indian market.

Structural steel: This is used in building dams, bridges and so on. Standards in the manufacturing of structural steel are voluntary and lack the need to specify end use. The lack of compliance to such voluntary guidelines and the absence of the need for requisite certification lead to dumping of poor grade structural steel.

countries (refer to Box 13.1), but also makes it difficult for the industry participants to benefit from each other's learning and improve their technology depth.

- Absence of national agenda and policy framework to support innovation.

A Systems Improvement Framework

13.38. It is essential to set the context before moving to the recommendations. Government support is essential to enable a country's industrial ecosystem to gain depth because technological learning takes a long time, requires large investments and is risky. Support to the enterprises should be in such a way that it motivates and enables enterprises to learn and develop complex capabilities and not become complacent and inefficient, which was the outcome of the industrial policy adopted by India until the 1980s.

13.39. Table 13.4 and Table 13.5 capture the generic policy levers that should be moved for faster growth of manufacturing over the next five years. The specific policy interventions must be tailored to fit the

requirements of sectors by a process of industry—Government consultation which, as has been emphasised before, will be the key to 'get it right'. MSMEs and large enterprises will require different kind of interventions from Government.

13.40. MSMEs play a critical role in innovation, thanks to their nimbleness and their ability to experiment with new technologies on small scales. However, they often suffer from lack of funds, inability to take risks associated with technology developments and the difficulty of attracting skilled manpower. Policy interventions for MSMEs must be tailored to their conditions. Government policies for MSMEs should therefore help them improve their technological capabilities by focusing on:

- Providing access to risk capital
- Setting up of standards for the industry
- Improving Industry/research institute/academia interaction, mostly in clusters
- Stimulating demand/providing scale through preferential treatment in government purchases

TABLE 13.4
Processes that Enable Learning

Process that Enables Learning	Policy Levers
1. Interaction between diverse components of the system—R&D, producers, customers, Government, institutes of skill development and so on.	<ul style="list-style-type: none"> • Cluster development • FDI and JVs • Industry/research institute/academia partnership • Higher education in the country
2. Creating 'safe-failing' spaces for experimentation by firms	<ul style="list-style-type: none"> • Access to risk capital, technology funds • Subsidy on interest costs • PPP model of funding
3. Creating a regime of 'Standards'	<ul style="list-style-type: none"> • Setting up a system of National Standards benchmarked to International Standards
4. IP regime, which helps firms to build on each other's innovation	<ul style="list-style-type: none"> • Effective 'IP' regime • Improving awareness of IP
5. System-wide improvement: Processes such as 'Total Quality Management'	<ul style="list-style-type: none"> • Mainly the firm's role to adopt such tools and increase organisational learning • Nation-wide, and State-wide campaigns to improve 'Total Quality' in all enterprises, including MSMEs, should be sponsored by Government through institutions such as Quality Council of India

TABLE 13.5
Manufacturing Ecosystem Infrastructure

Ecosystem Infrastructure	Policy levers
1. Physical infrastructure	<ul style="list-style-type: none"> • Cluster development • Special manufacturing zones (NIMZ)
2. Improving capabilities	<ul style="list-style-type: none"> • Skill development • Total quality management • JV, Technology transfer, FDI
3. Creating the manufacturing ecosystem	<ul style="list-style-type: none"> • Developing MSMEs • Common facilities through clusters • Developing Standards • Availability of quality human resources • Demand availability for manufactured products

- Modular industrial estates/laboratories near premier technical institutions with the required plug and play facilities.

setting up of a Technology Acquisition and Support Fund

13.41. On the other hand, large enterprises handle complex technologies and manufacture globally

competitive products for domestic as well as global customers. They compete with global manufacturers in local as well as in global markets. The Government policies for large enterprises can focus on:

- Improving IP regime
- Ensuring human resource availability by establishing institutions for technology education and research, educational institutions and so on
- Ensuring access to critical raw materials

Strategies for Change

13.42. Some high impact strategies for India at this time to accelerate the development of technological depth in the manufacturing sector have been analysed. These should receive special attention in policymaking and implementation.

13.43. Creation of coherence amongst existing institutional agencies towards developing national priorities for indigenous technology development.

13.44. Several countries like China and Singapore have followed a comprehensive approach to identify critical technologies to be developed indigenously and have formulated mechanisms to

ensure that these technologies were funded and incubated.

13.45. In India, we have various agencies like the Department of Science and Technology, NMCC and the Planning Commission working in this area. Connections between these agencies remain weak as they continue to function in silos, resulting in a cluttered approach to technology development. To make this process more robust and comprehensive (including funding and incubating projects), the present process/institutional arrangements should be reviewed and fine-tuned/restructured. The industry, as key stakeholders, should be involved and consulted in the design of new arrangements.

Create 'Safe-failing' Spaces for Companies to Engage in Innovation

13.46. Government participation in funding of research through a 'Technology Fund' or 'Technology Upgradation Fund' is an important instrument for reducing the risk for firms in investment in research. The structure of the 'Technology Fund/Technology Upgradation Fund' has to evolve over a period of time. Traditionally such funds have been operated in the form of Government grants or schemes. However, they can be more effective in producing outcomes if they were managed by professionally managed investment entities.

13.47. The ways in which the Government could provide/redesign fiscal incentives for R&D activities are:

- *Tax credit instead of tax incentives:* With the imposition of Minimum Alternate Tax (MAT) of 20 per cent, companies are unable to avail full benefit of weighted deduction. Equivalent benefits of weighted deduction on R&D spend should be treated as tax credit and be allowed to be set off against Tax and/or MAT payable.
- *Credit on inputs/capital goods used for R&D outside the factory premises:* The Cenvat Rules provide that credit can be availed on inputs and

capital goods if they are used in the factory of the manufacturer. Enterprises having R&D facility separately from manufacturing facility will not be able to claim Cenvat benefits on inputs and capital goods used for R&D. This anomaly should be removed and the Cenvat benefits to be available for inputs and capital goods used in R&D, even if the R&D is carried out in a different premises, as long as linkage between manufacturing and R&D activities can be established. Due to this lacuna, assesses with sizeable investments in R&D facilities outside their factory of manufacture will not be entitled to avail Cenvat credit on investments and certain operating expenses. Consequently, this forms a disincentive to setting up of R&D centres by increasing the costs of setting up such centres.

13.48. The tax incentives should be provided in such a way that they do not penalise existing enterprises that do not operate in special economic zones or particular locations/States. To ensure a 'level playing field' to all domestic manufacturers and to provide a wider stimulus by the incentives, the tax incentives should be available for all enterprises involved in a specific activity rather than for a few enterprises operating in some specific locations. Knowledge sharing should be improved between the industrial and financial sectors.

13.49. The financial sector works with many industrial sectors and thus can see patterns and, with its perspective, obtain insights that are not available to people within industrial institutions. There are several programmes like Small Industry Business Research Initiatives (SIBRI), Technology Development Board (TBD), Biotechnology Industry Partnership Programme (BIPP) and Biotechnology Industry Research Assistance Programme (BIRAP) which promote early stage innovations and PPPs. These institutes should work more often and closely with financial sector institutions to share knowledge that can improve policies for the manufacturing sector.

Strengthen the IP Regime and Systems to Leverage IP

13.50. A strong intellectual property regime is a prerequisite for creation of global IP from India. It has also become a requirement under WTO. While the importance of IP for creation of innovations in the industry is well understood, the question is whether developing countries will get penalised given that they are starting with a low base compared to developed countries. Various alternatives like 'utility model' of patents (as China has) to manage this need to be examined to put in place an efficient model that can help generation and protection of incremental innovations in Indian manufacturing.

13.51. Given the need for a strong IP regime from a long-term point of view, the following steps need to be taken:

- Improve IP management and protection mechanisms.
- Develop global information database on IPs accorded.
- Strengthen and modernise the process of patent examination and according patents.

13.52. Also, in order to leverage the benefits of IP:

- Build awareness about IP through education and training.
- Create national IP mission to continually evolve the IP strategy of the nation.
- Encourage joint IP filings by industry/academia/research institutes.
- Encourage the formation of companies specialising in IPs (through tax incentives).
- Exempt income tax for the income generated from domestic IPs.

Strengthen Partnership between Industry and Academia/Other Research Institutes to Create IPs Domestically

13.53. Industry-academia partnerships are relatively weak in India compared to many other countries. The partnership should aim for building an ecosystem which can create a virtuous cycle of education and research leading to IP creation and its

subsequent commercialisation. Such aspect in turn will incentivise and inspire further innovation. Some of the policy measures that Government can use to accelerate the development of industry-academia partnership are:

- Joint ownership of IP arising out of these collaborations.
- Align the goals and annual planning processes of central research institutions with that of industries through industry associations.
- Incentivise Central/State Research institutes to create joint IPs with Industry.
- Tying up a certain percentage of their budget to the number of collaborative IPs created.
- Incentivise university and industry for forging successful partnerships in university's governance, infrastructure, course curriculum design, faculty/students development and research.
- Create cluster innovation centres at universities with the aim to foster a favourable ecosystem and enforce industry-academia linkage.
- Provide an institutional framework for active interface between funding agencies, academia and industry.

Clusters (and NIMZ) Can Provide Enabling Infrastructure to Improve Technological Depth

13.54. Clusters play a critical role in propagating technological depth by facilitating technological learning and manufacturing through the presence of the entire ecosystem in the same geographical location. The National Manufacturing Policy, which outlines creation of NIMZs, was cleared by the Cabinet in November 2011. It ensures that business is provided with the ecosystem required for growth, not only in manufacturing, but also for investments in research and development. The attractiveness of NIMZs will be even higher for new high-technology industries, which will benefit from the localised presence of the entire value chain of participants. Also, the benefits of industrial clusters to MSME participants are also well understood, and the MSME Ministry is using the cluster approach to drive the growth and depth of MSME industries.

Improve Technical Standards, Voluntary Compliance and Conformity Assessment

13.55. Standards are a form of embodied technical knowledge accessible to all types of business that enables more effective product and process development. They promote and enable the diffusion of technology in a form that is readily assimilated by firms with the complementary capabilities to take up and use the new methods. Standards, therefore, constitute one of the important foundations for the technological depth in manufacturing, and are accorded high importance by the policy planners in the developed world.

13.56. During the Twelfth Five Year Plan, the focus on technical regulations should be on:

- Developing a policy on technical regulations.
- Capacity building of regulators (BIS).
- Review of technical regulations to identify the gap vis-à-vis national standards.
- Sensitising the industry regarding the need to provide scientific data to regulators to formulate effective technical regulations.
- Setting up of helpdesks in industry bodies and export promotion councils for information dissemination.

13.57. In addition, voluntary compliance initiatives must be strengthened:

- Promoting and funding a 'Standards Cell' in industry associations and Standards Developing Organisations (SDO).
- Capacity building of SDOs.
- Capacity-building programmes for the training of technical staff in the industry for writing company- and industry-level standards.

13.58. Government should also create a database-based/software-based system to track the changes in technical standards/voluntary compliances globally and alert Indian manufacturers of development.

13.59. While the Standard-setting process sets the standards to be followed, conformity to the standards is assessed by conformity assessment agencies.

While many conformity assessment agencies have sprung up in the last few years, it is important that these conformity assessment agencies are of world class and their certificates are acceptable across the world.

13.60. To achieve these, the following steps are envisaged during the Twelfth Five Year Plan period:

- Promoting the acceptance of Indian conformity assessment globally
- Capacity building for inspection bodies/certification bodies
- Developing regulation on conformity assessment

13.61. Quality Council of India, set up jointly by the Government of India and the top industry associations—CII, FICCI and ASSOCHAM, has been working to

- Establish and maintain an accreditation structure in the country
- Help representing India's interest in International forums
- Spread the quality movement through the country

13.62. The Twelfth Plan will focus on strengthening the capabilities and role of the QCI.

Removing Anomalies in Duty Structure

- *Remove special schemes that allow import of finished goods at concessional custom duty:* In almost all promotional schemes where import duties are reduced (nil duty project imports, certain defence purchases, SAD exemption under ITA Agreement for IT products and so on), imports get the benefit of reduced duties/nil duty. This erodes the level of protection which would have otherwise been available, thereby, creating a systemic disadvantage for local manufacturers. It is therefore recommended that import of finished goods at concessional custom duty under special schemes be discontinued.
- *Inverted duty structures (Higher duty on intermediate products vs. final products):* For specified purposes, presently there is higher duty on

intermediate goods (used by the domestic manufacturer for assembly/manufacture of goods), as compared to duty on finished goods. This in turn leads to higher input cost for the domestic manufacturer. It is therefore recommended that duty on intermediate goods be brought in line or set lower than applicable for final products.

13.63. The Government has corrected, as best possible, the issues related to inverted duty structures (illustrated above) raised by industry. It must review any new case that is brought to its notice and must undertake a study of effective rate of protection across sectors.

13.64. Some issues regarding CST/VAT retention and VAT/SAD were also analysed:

- *CST/VAT Retention:* Interstate movement of goods by domestic manufacturers carries added cost in the form of central sales tax (on interstate sales)/retention of input VAT credits (on interstate stock transfers). This can be avoided in case of imports by executing sales in the course of import or through directly consigning the goods to the customer's state. This creates disadvantage to domestic manufacturers. Therefore, CST on interstate sales and provisions with respect to retention of input VAT on interstate stock transfers should be abolished.
- *VAT vs. SAD:* VAT rates have been increased from 4 per cent to 5 per cent, however there has been no consequential increase in the rate of SAD on imported products which is levied in lieu of VAT. Therefore, SAD should be increased to 5 per cent to reflect the pan-India based trend of revision of the VAT/CST rate bracket of 4 per cent to 5 per cent.

13.65. In order to resolve the aforesaid issues, it is necessary for the Central and State Governments to quickly build consensus on the design of a comprehensive GST and implement the same at the earliest.

Encouraging FDI and Joint Ventures

13.66. FDI (investments by foreign companies in Indian ventures) and Joint Ventures of Indian

companies with foreign partners can provide access to technology in areas in which domestic expertise is inadequate. The Government must identify the areas, in consultation with the industry, in which FDI and Joint Ventures can help to bring technology. Several problems that are impeding FDI/JVs need to be addressed. Some these are:

- The ambiguity in the characterisation of income arising to foreign investor on transfer of technology from the perspective of direct-tax obligations. This leads to uncertainty with regards to its taxability in the hands of foreign investor thereby discouraging the flow of technology from outside India. The foreign investor is required to obtain PAN to enable the payer to withhold taxes at appropriate rates. Also, the foreign investor is required to file its annual return of income before the tax authorities in India for the purpose of claiming credit with respect to the taxes withheld by the payer in India. Such additional compliances could become quite cumbersome for the foreign investor in India especially where the foreign investor does not have any operations in India.
- The R&D cess paid by the importer cannot be adjusted against any output taxes paid by the importer, resulting in additional cost of 5 per cent for the technology importer.
- Service tax paid on import of technology cannot be adjusted against taxes paid on output, if the manufacturing is outsourced.
- Limitation on technology cost as percentage of total investment available for state tax exemptions.

Preference for Domestic Products in Government Procurement

13.67. The cost of any manufacturing activity (excluding raw materials and utilities) depends on the maturity of manufacturing technology used and the magnitude of the demand. For a matured technology, the cost of manufacturing will be relatively low, due to the learning curve effects. Similarly, due to scale effects, the unit cost of manufacturing goes down with the increasing demand. Therefore, a domestic enterprise using new indigenous technology will have a cost disadvantage

compared to a global enterprise that has the benefits of matured technology. Unless there is some incentive provided to domestic enterprises to offset this handicap, developing indigenous technology will be difficult.

13.68. Therefore, Governments in many countries, developing as well as developed, provide preference in Government procurement to domestic enterprises. However, to ensure that this policy measure does not lead to development of substandard quality products or create inefficiencies in the domestic enterprises, the preference in procurement can be made applicable with minimum quality standards; a cap on the permissible price differential between domestic and imported products, and also a sunset clause.

13.69. Some ways in which the preference for indigenous products can be provided in Government purchases are:

- In sectors of strategic importance, procurement should be done only from those vendors, who have locally established manufacturing base.
- A multi-tier tax structure can be introduced, which offers concessional tax rates for products with higher local value addition.
- A certain percentage of Government procurement to be reserved for enterprises using domestic manufacturing/domestic IP; and a certain percentage of it can be reserved for firms in MSME Sector.

13.70. However, as a prerequisite to implementing this procurement strategy, streamlining of procurement functions is essential. Public procurement organisations must be clear about how national policy goals should be translated into procurement practices without compromising quality. ‘Least cost’ is not always the right strategy and needs to be balanced by other guidelines (life-cycle costs such as service agreements, continuous improvement contracts and so on). A balanced approach should be taken to determine the weight assigned to price versus other qualifying criteria.

Aligning Investment Obligations Under ‘Offset Policy’

13.71. Offsets as a policy tool should be encouraged for public procurement in sectors where the Indian industry does not have existing technology or capability. The obligations of investments of foreign companies under ‘Offset Policy’ should be targeted towards investment in industries in which the country needs to improve technological depth. Articulation of clear objectives for an offset programme, not just for defence industry but also for the economy as a whole can become an instrumental lever to further investment and growth of the country’s manufacturing sector.

Encouragement of Local Value Addition in Critical Natural Resources

13.72. Some natural resources like good-quality coal and iron ore are becoming short in supply in the global economy with growing demand from developing economies especially China and now India. Domestic availability of some of these raw materials provides us a competitive advantage which we should leverage to build domestic industries that add value to these resources, thus creating additional jobs and improving our trade balance. Going further up the value chain Government policies and duty structure should be designed in a way to incentivise value addition of steel rather than exporting steel in raw material form.

13.73. In general the trade-off between export of inputs which are in demand elsewhere in the world, and use of those inputs for improving the competitive position of domestic user industries is a tricky one, while promoting entrepreneurial freedom and free trade. These trade-offs must be understood and sensitively managed to ensure competitive and sustainable growth of domestic manufacturing. Examples of vulnerabilities that have developed for Indian industries, when longer term consequences of policies have not been foreseen, are the virtual disappearance of production of intermediaries for generic drugs which China is now dominating, and also the dwindling of Indian capital goods industries (refer to Box 13.2), where too Chinese industry is becoming a big international supplier. Chinese industrial policy

Box 13.2 Dwindling Indian Capital Goods Industry

The capital goods industry can be considered as the ‘mother’ of all manufacturing industry and is of strategic importance to national security and economic independence. It is in the interest of User Sectors that the capital goods industry be strengthened since it is well established that the presence of a strong domestic industry increases competition and helps in reducing the capital cost of projects. And most importantly, in economical maintenance of plant and machinery. Imported plants come at lower cost but the foreign suppliers make up for that in their high priced spares and maintenance contracts.

However, Indian capital goods industry is facing severe competition from Chinese companies over the last few years. In the case of machine tools, imports account for about two-thirds of the domestic requirements and is increasing further. The import of power-generation equipment from China at much lower cost is also making the domestic industry uncompetitive.

The major factors responsible for increasing Chinese competitiveness are:

- Artificially depreciated Chinese currency
- Tax advantages and Government subsidies given by the Government
- Much lower interest rates
- Simpler labour laws
- Better infrastructure leading to lower cost of power, transportation and cluster approach helping specialisation of labour and engineering skills

This is further complicated by the absence of level playing field for Indian manufacturers:

- All domestic manufacturers of capital goods are rendered uncompetitive due to additional burden of sales tax, entry tax, octroi, VAT and other local duties and levies.
- For specified projects (Oil and Gas, mega nuclear/hydel power, fertiliser, refinery and so on) zero/5 per cent customs duty applies on capital goods.

While it may be preferable from user industry point of view to allow the import of capital goods at lower costs in order to improve their competitiveness, this will result in over reliance of Indian industry on other countries for key strategic inputs, exposing itself to vagaries to the policies of these countries. Also, this does not help in building technological depth of the Indian industry and manufacturing ecosystem.

has evidently done far better than India’s in building depth in China’s industries.

HUMAN RESOURCE DEVELOPMENT, JOB CREATION AND SOCIAL PROTECTION

13.74. One of the primary objectives of the plan is to increase the competitiveness of Indian manufacturing. Human resources are of critical importance for the growth of knowledge and technology, value addition and improvement of competitiveness in manufacturing through processes of continuous improvement. In fact, the human resource is the only ‘appreciating resource’ in a manufacturing system. It is the only resource that has the motivation and ability to increase its value if suitable conditions are provided, whereas all other resources—machines, building, materials and so on—depreciate in value with time. The best enterprises view their people as their prime asset and the source of their competitive advantage. Nations that have achieved sustainable

competitiveness in manufacturing even when they do not have raw materials required, such as Germany, Japan and South Korea, have created systems for the continuous improvement of the capabilities of their human resources.

13.75. India must invest in and build its human resource capabilities to catch up with other countries that have moved ahead and thereafter sustain competitive advantages in manufacturing. Indeed the contentious debate of ‘labour’ versus ‘capital’ in the enterprise, as well as disputes between the institutions that represent the people working in the enterprise and owners of the capital could be reframed if employees were seen as assets, with value that can appreciate, rather than as labour costs.

13.76. The purpose of this section is to propose a set of holistic changes in key areas that require close involvement and buy-in from various stakeholders.

Consensus about these holistic changes is more likely to be achieved if, as mentioned before, the primary challenge was reframed as the development of human assets to build India's manufacturing ecosystem and strengthen India's manufacturing enterprises, rather than merely management of costs of labour.

13.77. Challenges in meeting the objectives lie broadly in three areas:

- From a skill development perspective, there is a significant gap between the existing training capacity and people entering the workforce. A very small proportion of total manufacturing workforce is currently skilled.
Moreover, less than 25 per cent of the total number of graduates are estimated to be employable¹ in manufacturing.
- The total training capacity in the country is about 4.3 million for all sectors including manufacturing.² The Apprentice Training Scheme (ATS), which is supposed to provide a bridge from education to employment, has very low penetration and is suffering from significant administrative issues.
- For entrepreneurs and other employers, the perceived lack of flexibility of changing the size and nature of the workforce can act as a retardant in making investments that could lead to greater employment opportunities. Furthermore, the complexity of labour laws and the administrative mechanism of the laws make it harder to do business in the country.
- By 2025, an additional 8 million management workers³ (supervisors and above) are estimated to be required. Well-trained management/supervisory staff are critical for improving the productivity and industrial relations in large as well as small manufacturing enterprises.

Strategy and Key Recommendations

13.78. Human resources should be managed as a source of sustainable competitive advantage. Government policy changes should induce and support such firm level strategies. The key stakeholders who will need to work together to make the necessary changes to the system in key areas mentioned

above are: Government (at the Centre and State level), Industrial organisations and the unions.

13.79. The strategies for meeting the objectives are in the following categories:

- Inducing job creation by reducing the cost of generating employment.
- Developing a supply of qualified human resources to meet the demand from additional job creation.
- Enhancing skill levels of current workforce to improve productivity.
- Improving the state of manufacturing management in the country.
- Providing social protection to low-income workforce.
- Improving industry-workforce relationships.

Inducing Job Creation by Reducing the Cost of Generating Employment

13.80. There are two major barriers to employment generation: limited flexibility in managing the workforce and cost of complying with labour regulations. Both these barriers must be removed in order for jobs to be created at a much faster rate.

Limited Flexibility in Managing the Workforce

13.81. The recommendations to increase the level of flexibility while ensuring fairness are:

- Companies should be allowed to retrench employees (except categories such as 'protected workmen' and so on) as long as a fair severance benefit is paid to retrenched employees. This severance benefit should be higher than what is currently mandated—and the value should be arrived at through tripartite dialogue between Government, employers' associations and employees' associations.
- In order to ensure that there is sufficient liquidity to pay the severance benefit to the retrenched employees, a mandatory loss-of-job insurance programme could be put in place. This will especially be useful in situations where the retrenchment is due to bankruptcy or exit of the employer and will reduce the justification for requiring prior permission to shut down businesses.

- The threshold level of employment for the Chapter VB of the Industrial Disputes Act and the threshold for applicability of the Factories Act should be raised to at least 300 which was the level in 1983.
- The process of engaging contract labour should be reformed—employers should be allowed freer use of contract labour while ensuring that the rights of contract workers are protected, which is not the case at present.

Cost of Complying with Labour Regulations

13.82. The traditional enforcement approach which is based on inspection—prosecution—conviction creates incentives for rent-seeking behaviour, especially if the laws are complex or have provisions that are contradictory. The complexity of compliance impacts smaller enterprises much more. They cannot bear the high administrative costs.

13.83. Recommendations to improve compliance and also contain the cost of complying with labour regulations are:

- Simplification of labour laws: The implications of labour laws should be detailed through a series of ready reckoners that are easily available and regularly updated so that inspectors and employers have a common set of rules to look at.
- Improvement of administration: Higher investment should be made in the training of inspectors to ensure that they are able to efficiently identify incidences of actual non-compliance rather than harass employers.
- Facilitating easier filing: Filing of reports should be made a once a year activity with an online option. As far as possible, the interface between enterprises and Government should be computerised to increase transparency and efficiency and remove scope for rent seeking.
- Developing a self-certification model: While ensuring that regulations governing labour welfare must be complied with, a self-certification model should be developed where appropriate.
- Additionally, fiscal incentives to encourage permanent job creation should also be considered, after evaluating their implications and potential

impact. For example, skill building and training costs of permanent employees can be considered for accelerated tax benefits (subject to a ceiling on percentage of salary paid to permanent employees).

Developing a Supply of Qualified Human Resources to Meet Demand from Additional Job Creation

13.84. The manufacturing sector may need more than 90 million people by 2022. However, the current capacity for skill development is ill equipped to meet this demand.

13.85. *Role of industry:* To enable the industry to play its role in defining the requirement of manpower both in terms of quality and quantity, Sector Skills Councils envisaged in the National Skills Policy are being set up. These councils will identify skill development needs in their sector, evaluate the gaps, create plans for skill development and improve the quality of the training system. The councils are also expected to establish sector specific Labour Market Information Systems (LMIS) to assist in planning and delivery of training.

13.86. *Private sector participation in skill development:* For the private sector to play a role in augmenting the skill-development capacity in the country, effective PPP models are needed. Existing ITIs should be clustered together in projects with total training capacity of at least 1,00,000 each to allow private sector service providers to leverage scale benefits leading to long term financial sustainability. For inducing the private sector to participate in creation of additional capacity, scalable and sustainable business models with direct linkages to employment should be deployed. The NSDC has created such models. They should be implemented across 20–30 projects specific to manufacturing in partnership with industry associations and from funding through NSDF.

13.87. *Improving ITIs:* We need to improve private-sector involvement in upgrading existing ITIs and also improve their curriculum and content through the sector-skills councils.

13.88. Attracting students: As a long-term strategy, it is important to make acquisition and improvement of skills an aspiration for people, especially youth. This could be achieved by recognising high-skill persons at the national and State levels along with recognition of other worthy citizens. For example, an unsecured loan scheme should be created for those who aspire to undertake vocational training. Large enterprises could also provide special incentives and recognition for acquisition of high skills.

13.89. Overall coordination: A number of initiatives have already been taken by various Government ministries to tackle issues related to skill development both at the Central and the State level. Coordination between these initiatives should be improved. The role and performance of the National Skill Development Coordination Board should be assessed. To ensure that skill-development activities are aimed towards areas of maximum impact, it is important to put in place an information system that provides data on availability and requirement of skilled resources.

Enhancing Skill Levels of Current Workforce to Improve Productivity

13.90. Training and skill building of the existing workforce is an important element of the strategy for increasing productivity of manufacturing in India. Training of employees can be incentivised by allowing tax deductions for expenditure incurred on training. Currently, skill building is predominantly achieved by in-house training of workers by each enterprise. However, clusters and NIMZs provide opportunities for shared infrastructure to provide training for skilled and semi-skilled workers.

13.91. A number of existing initiatives are focused on setting up tool rooms which are necessary for SMEs. These tool rooms can be made more effective by periodic performance audits by independent agencies and also by operating them on a PPP model in collaboration with industry associations. Just as tax incentives are provided for investments in critically required infrastructure assets, fiscal measures including tax benefits on training expenditure may also be considered for investment in critical human assets. MSME Sector alone needs to skill 42 lakh persons in

the Twelfth Plan period, thus, requires to increase its current training capacity from 4 lakh person per year to at least 17 lakh persons per year by 2017.

13.92. Apprenticeships can be an effective way of ensuring that entry-level workers have the skills required to join the formal workforce. While there should be no obligation to employ apprentices, the current apprenticeship model needs to be reformed by simplifying workflow for engagement of apprentices by employers, inclusion of new trades and recording compliance through e-filing, removing NOC requirement for out-of-region candidates. Further, it is proposed to make all graduates eligible for apprenticeships and the duration of courses should be reduced to a minimum of three months and should be converged with MES. Outdated curriculum needs to be updated and outsourcing of classroom trainings should be allowed.

13.93. Changes in the Apprenticeship Act may have to be made. In the meantime, a new model of in-company training should be deployed. In this model, companies should be allowed to take trainees for a period of up to six months.

Improving the State of Manufacturing Management in the Country

13.94. There were a total of approximately 5 million managers in the manufacturing sector in 2008. If the manufacturing sector grows at the targeted 12–13 per cent, 8 million more managers will be needed by 2025. Well-trained managers are extremely important for improving the productivity of manufacturing enterprises and maintaining harmonious industrial relations. Currently, only a very small portion of graduates from engineering and management institutes take up careers in manufacturing. Consequently, there is a significant gap between supply and demand.

13.95. The quantity and the quality of management in the manufacturing sector can be improved by the following initiatives:

- Increasing collaboration between manufacturing companies and engineering/management institutes for joint projects in which staff and

students of the institutes can get some hands-on experience.

- Encouraging enterprises (especially larger ones) to run good graduate engineering programmes which can be a source of management talent for themselves as well as the manufacturing sector generally.
- Scaling up programmes such as Visionary Leadership for Manufacturing (VLFM) at the national level.
- Setting up centres of excellence for manufacturing management through MoUs between institutes, government bodies and industry partners. Business schools that focus only on manufacturing management should also be encouraged.
- Creating a PPP model for engineering and management colleges with partnership with industry associations and employers with focus on manufacturing management.
- Launching a campaign focused on attracting management talent to the manufacturing sector.
- A large source of potential managerial/supervisory staff is the current workforce. Support should be provided to enable deserving members of the workforce to be promoted to management positions.

13.96. Recent reviews with many sectors of industry reveal a crying need for better supervisors and foremen—the first and second levels of supervision—who are the backbone of productive and harmonious manufacturing enterprises. Development of supervisors and foremen, through suitable programmes, collaboratively designed and managed by industry and educational and training institutions must be ensured along with the emphasis on development of skilled workmen and good managers.

Providing Social Protection to Low-income Workforce

13.97. Formal sector workers can leverage collective bargaining to obtain social security; however, the informal workforce is dependent on government actions to improve social protection for them. A number of social security schemes have been launched in the recent past. However, the existing coverage represents a very low percentage of the

total number of workers in the manufacturing sector. For example, the New Pension Scheme (NPS) that was launched in May 2009 to increase pension coverage, particularly to the informal sector, has less than 2,00,000 voluntary subscribers—this is far less than the total intended coverage for such a scheme. Limited access to social security is exacerbated for those with low or uncertain incomes.

13.98. *Unemployment benefits:* Low income workers in transitional phases of unemployment are particularly vulnerable as they are unlikely to have significant savings. To help overcome the problems associated with social protection for temporarily unemployed workers, which include contract workers at the end of their contracts, a solution could be for these workers to be part of a ‘sump’ as permanent employees of contract agencies that are provided with Government support to ensure skill upgradation of these workers. The focus should be on creating a pool of workers who can be available to employers and ensuring that those that are unemployed have avenues for training as well as financial assistance. For example, the Automotive Mission Plan has recommended the formation of a Supplementary Unemployment Benefits Fund to be created by automotive companies for providing compensation to laid-off workers. Such funds in other sectors too can be utilised to finance the creations and sustenance of the ‘sumps’ that could be the ‘win-win’ solution out of the ‘fairness–flexibility’ dilemma.

13.99. *Increasing penetration of existing schemes:* To ensure that existing schemes reach the entire workforce, it is important to increase awareness of these schemes through communication programmes. The distribution channels for these schemes should be evaluated and measured regularly and private sector participation should be encouraged too. Financial literacy of the workers in the informal sector should also be improved so that they make better informed decisions about participating in social-security schemes.

Improving Industry Workforce Relationships

13.100. Strong and effective industry relations can enable managements of enterprises and their

workers to collaborate in increasing the productivity and competitiveness of the manufacturing sector. Unions have a critical role to play in ensuring inclusive growth of the manufacturing sector, especially by working towards social protection for the workforce. They can also play valuable roles in other areas such as skill development. The National Skill Development Policy has recommended that trade unions contribute in areas such as developing competency standards, course design, improving awareness of and promoting participation in skill development among the workforce. To ensure that unions can play a broader and more effective role, it is important to invest in capacity development of unions through training of their leadership.

13.101. The multiplicity of unions in the same enterprise for the same type of workers can lead to inter-union rivalries and can weaken collective bargaining. Therefore, legislation that enables one union per enterprise is strongly recommended. The union leadership should also be held accountable for any illegal behaviour by union members during negotiations. The practice of withholding recognition of unions should be discouraged. Strong gain-sharing systems can help to improve productivity.

13.102. The Government has a crucial role in enabling good industrial relations by providing platforms for the industry and the workforce to participate in policy development and implementation. Since labour figures in the concurrent list in India, both the Central and State Government's role in such platforms should be that of an impartial facilitator focused on creating consensus amongst employers and employees around solutions. In especially contentious areas such as changes in labour laws, the Government should enable the development of consensus positions between the various interested parties. The 'backbone organisation' described in the Way Forward Chapter should have the capabilities to effectively assist in such a process of consensus creation.

BUSINESS REGULATORY FRAMEWORK

13.103. Countries that have performed better than the others in terms of thriving business have, to a

great extent, done so on account of the quality of the business regulatory environment, which is an important factor distinguishing better performing countries from others. The key objectives of streamlining of business activities through the regulatory framework should be:

- Low compliance cost for doing business in India
- Simple regulatory environment, saving time and energy for the businesses; and
- Ensuring fair competition

13.104. The country must improve regulations and implementation in many subjects to make India generally a more attractive country for doing business. These include land and environmental regulations, labour laws and their administration and so on. It should be noted that, in the context of India's federal structure, the ability to mandate specific reforms to the regulatory framework from any centralised apex body is fairly constrained. Therefore, while nodal agencies may be set up to focus attention on matters that must be attended to across the country, and this section and others mention some, it is imperative that the role of such agencies in the process of making improvements across the country fits the country's federal and decentralised political structure. Such agencies cannot and must not usurp local authority.

Status and Key Challenges

13.105. The present regulatory environment is seriously deficient for the reasons enumerated below:

- Weak institutional architecture for business regulations in the country
 - Despite that high priority of the business regulatory reform agenda in the country, there is no dedicated authority that can guide the whole process of reform in a structured, planned, cogent and systematic manner, which could mandate the respective departments of the Union, State and Local Governments to comply in a timely, result oriented and predictable way.
- Ambiguous nature and vast scope of business regulations: there are vast numbers of business regulations at different levels of Government in existence in the country. There are instances of

contradictory as well as overlapping business regulations on account of these being administered by the different tiers as well as layers of Government.

- Absence of national repository of business regulations: despite the advancements in Information and Communication Technology (ICT) and its ever-growing applications and usage, there is no dedicated online repository to track all the business regulations and procedures.
- Lack of coherence in business regulatory governance across country; business facilitation is often mentioned as part of the agenda at the national as well as State levels. But there is lack of coherence in all such efforts. There are wide variations in Government-business transactions taking place in different locations of the country. It has also been found that there is a lack of predictability and standardisation in terms of timelines as well as process adopted by different State Governments when it comes to facilitating business.
- Lack of defined mechanism for consultation between Government and industry: the interface between Government and the industry is also not well defined. There are periodic consultations among various industry collectives and specific Government departments located at different levels, but such consultations are not structured enough to be guided by a well-defined and outcome-oriented process.
- Inherent limitations of regulatory system in country: lack of periodic-review clauses in regulations and Lack of Regulatory Impact Analysis (RIA).
- There have been recommendations for regulatory reforms earlier as well, but due to absence of any one dedicated agency accountable for the reforms, they could not be implemented.

Strategy and Key Recommendations

Follow-up Over Previous Administrative and Regulatory Reform Endeavours

13.106. Lack of implementation of earlier recommendations on regulatory reforms has contributed to the current situation of business-regulatory framework in the country, both at the Central and State level. All these recommendations need to be

reviewed and a repository of all these documents needs to be created. After this an enquiry can be taken up to check the extent to which these recommendations have been implemented or are pending by the public authority or department.

13.107. There is a need for a process for responding to the existing recommendations. In such a system once a certain expert group or commission of enquiry has submitted its report, the respective departments are required to prepare a response. That response is put up in the public domain along with the original recommendations. This makes it easier for various stakeholders to understand the extent to which the recommendations have been accepted along with the reasons for non-acceptance, if any.

Establishing Enabling Institutional Architecture

- Formulating national policy on business development and regulation
 - The policy should also provide the principles of optimal business regulatory governance. It is recognised that there will be a special role of the Prime Minister and Chief Ministers in the aforementioned policy making process because in the final analysis, the actual adoption of the policy will entirely be dependent on the political leadership.
- Drafting and enacting 'National Business Development and Regulation Bill'.
- Building institutional architecture for looking after the business-regulatory reforms in the country: a dedicated institution can be set up for this purpose. The institution should be set up at the national level as well as at State level.
- Enabling institutional architecture for ensuring competitiveness in manufacturing. The same is required in both, Central as well as State level.
 - At the Central level the National Manufacturing Competitiveness Council (NMCC) has been entrusted with this responsibility.
 - Similar institutions may be set up at State level; to be called State Council on Manufacturing Competitiveness and Competition Reforms.
- In June 2011, the Ministry of Corporate Affairs has set up a Committee to draft National

Competition Policy (NCP). In February 2012, the Drafting Committee submitted a Draft National Competition Policy and comments of all stakeholders have been invited. Once this policy is approved by the Union Cabinet, further steps are required:

- Building consensus on the policy
- Creating institutional framework for operationalising the policy, as recommended by the Committee
- Creating incentive and disincentive mechanisms for States to implement NCP
- Operationalisation of National Manufacturing Policy and development of State manufacturing plans in line with National Manufacturing Plan.

Systematisation of Business Regulatory Governance

- Mapping and classification of all existing business regulations and procedures and providing an online one-stop shop—‘National Business Facilitation Grid’ for all information related to business regulations and procedures in India. Design principles of this on line portal can be finalised through a consultative process. The Department of Industrial Policy and Promotion is the nodal agency for the NBSFG repository.
- A system of mandatory reviews of existing regulations at periodic intervals should be established and operationalised. This will achieve the desired goal of making the regulatory system intrinsically strong and up to date.
- A decentralised Single Window System should be established with appropriate geographical spread. The Single Window System, governed by a common minimum standard, should, rather than being a coordination office, be endowed with access to relevant information and sufficient delegation of powers from all concerned regulators, including Central, State, Local and Sector regulators. This would help reduce the start-up time for businesses by providing all requisite approvals and licenses, if any, through the Single Window System.
 - Recognising the wide variations with business procedures at the country level, it is recommended to benchmark the execution timelines and processes that are undertaken by different

Government entities to facilitate business requirements.

- A team of Business Facilitation Officers (BFOs), in each of the participating regulatory authorities, may be asked to aid the Single Window System, and the BFOs could be made accountable for defaults or deviations resulting in aggravated costs of compliance to businesses. The desirability and feasibility of such a Single Window System should be determined through a consultative process.

eBiz Mission Mode Project

13.108. The eBiz Mission Mode Project, under the National e-Governance Plan, aims to create a business and investor-friendly ecosystem in India by making all business and investment related regulatory services across Central, State and Local governments available on a single portal, obviating the need for the investors or the business to visit multiple offices or a plethora of websites. It is envisaged that the services offered on eBiz will eventually cover the entire life cycle of a business—right from its establishment, through its ongoing operations, to even its possible closure. Once operational, this project will also create a platform for multiple Government agencies to cross validate their information.

13.109. The project is being implemented as a 10-year PPP with M/S Infosys. The first-year pilot includes 8 Central Departments and States (Andhra Pradesh, Haryana, Maharashtra, Tamil Nadu and Delhi) covering 29 core services. Five more states (Punjab, Uttar Pradesh, Odisha, West Bengal and Rajasthan) and 21 more services will be added during the next two years of the pilot phase. An end-to-end solution providing the services under the Andhra Pradesh Single Window Act will also be provisioned on the eBiz platform by September 2013 along with the payment solution gateway.

Adopting Regulatory Impact Assessment (RIA)

- Tool of RIA should be developed for Indian context through a consultative process and due research reflecting upon global experiences with its adoption and usage.

- The parameters of RIA should be clearly spelt out for evaluation (which should gradually be expanded to include the following eight elements: policy coherence; cost of doing business; competition; innovation; SMEs; consumers; labour; environment and commons).
- Process of doing RIA should involve a wide stakeholder consultation.
- RIA has to be mandated in the country in ex ante as well as ex post manner.
- It is recommended that Policy Coherence Units (PCUs), for conducting RIA, be established under the respective State Planning Boards and at the national level. Such policy analysis functions can be connected with the capabilities of the proposed backbone organisation.
- Disclosures on the adoption of ‘National Voluntary Guidelines on Social, Environmental and Economic Responsibilities on Business’ (NVG) principles should be made mandatory for businesses. Adoption of NVG principles can be made mandatory for all public–private partnership projects by the relevant authority at the time of project inception. This will help in mainstreaming these principles.
- Establishing the required institutional architecture for facilitating adoption of NVG principles. Awareness and implementation of NVG principles is currently the responsibility of the Indian Institute of Corporate Affairs. The IICA’s abilities in this respect should be further strengthened.

Making Businesses More Responsible Towards Society

- Considering the importance of the subject, ‘business responsibility’ should be included as a separate subject under the Government of India (Allocation of Business) Rules 1961, and Ministry of Corporate Affairs can be entrusted with the responsibility of carrying out these activities.
- Redefining the contract of business and society and developing new rules of the game for corporate conduct.
 - Needs to be done through a widespread consultative process.
- Stronger role of business associations in responsible business.
 - Business associations should be encouraged to develop and impose rules of conduct on their own members.
 - Business associations should be entrusted with the responsibility of overseeing the compliance to rules of corporate conduct.
 - Such associations should provide their members a process for debating and agreeing on voluntary imposed norms, assistance to members to develop capabilities to conform to these norms and, very necessarily for such associations to become trusted by stakeholders as effective institutions for self-governance, internal governance that disciplines errant members.

Developing an Ongoing Process of Stakeholder Consultation

13.110. For achieving the objectives of a stakeholder consultation, it is imperative to have capacity, building both ends: at the Government side as well as at the industries. A process of productive consultations, and the roles of representative institutions of employers and unions in these consultations, in improving the productivity of the country’s manufacturing ecosystem, and its sustainable competitiveness, cannot be overemphasised. The competitiveness of German and Japanese manufacturing industries, in spite of high-wage costs and expensive currencies, in contrast to the relative decline of US and UK manufacturing industries, is attributed to the better collaborative processes in the former countries. The following actions must be taken to achieve this objective:

- Passing a legislation mandating stakeholder consultation and also defining the process that needs to be followed.
- Measures to strengthen industry associations and their structure to enable them to convey the view of industry in a constructive manner.
- Similar capacity building for stakeholders, such as labour unions.

13.111. *Developing a Business Regulatory Governance Mechanism* to choose appropriate regulatory alternatives among self-regulation, co-regulation and public regulation.

- Currently there is no structured modality exploring various alternatives for achieving regulatory objectives.
- Detailed analysis should be undertaken to determine which alternatives to regulations are feasible as well as beneficial for Indian context.
- As each form of regulation has merits and demerits, a desirable combination of all three regulatory alternatives may be evolved gradually.
- Such mechanism will serve as a ready reference one-stop shop for the policymakers as well as the business community while arriving at the choice of appropriate mode of regulation.

Capacity Building for Carrying Out Regulatory Reforms

13.112. Since carrying out the aforementioned regulatory reforms requires a tremendous effort, capacity needs to be built in order to implement them. The capacity-building framework needs to incorporate the following:

- Developing resources such as modules, guidelines, methodologies, reference manuals, checklists, case studies and so on as reference material for regulators.
 - These resources should also be available through an online-knowledge portal.
- Training programmes for regulators need to be arranged.
- A review may be initiated to determine the feasibility of expanding the roles of institutions functioning under the aegis of the Ministry of Corporate Affairs, namely, Indian Institute of Corporate Affairs, Competition Commission of India, Institute of Chartered Accountants of India, Institute of Company Secretaries of India and Institute of Cost Accountants of India.

ENSURING ENVIRONMENTAL SUSTAINABILITY WITH INDUSTRIAL GROWTH

13.113. The rise in growth in the resource intensive manufacturing sector is enabled and facilitated by an ever-increasing rate of material use leading to manifold impacts to the environment. The contribution of the manufacturing sector to environmental degradation primarily occurs during the following stages:

- Procurement and use of natural resources
- Industrial processes and activities
- Product use and disposal

13.114. The air, water and land are affected through the environmental impacts created through the operations of manufacturing units.

Key Objectives

13.115. Rapid ecologically sustainable industrial growth with focus on

- Mainstreaming and promoting green business: an environment has to be created wherein being green is not viewed as just an obligatory expectation of a company, but as an area of primary focus for the company to develop further and be recognised as a leader.
- Protecting natural resources: natural resources have to be prolonged to their fullest use to maintain the aim for continual economic growth and lessen environmental impacts.
- Addressing funding issues: which act as a constraint for movement towards a more sustainable industrial model.

Status and Key Challenges

13.116. The Central Pollution Control Board has identified 17 highly polluting industries, the majority of which are manufacturing industries. MSMEs, in particular, can have a significant impact on the environment as they are generally liable to be equipped with obsolete, inefficient and polluting technologies and processes. Seventy per cent of the total industrial pollution load of India is attributed to MSMEs.

13.117. New technologies leading to cleaner processes and operations are not being developed at a fast enough pace to address the urgent need for environmental protection.

13.118. The current ecosystem does not encourage and facilitate the mainstreaming and scaling up of new technologies for widespread use, mainly due to a lack of financial support, resources and Government assistance.

13.119. The waste management and recycling industry in India is currently vast but largely unorganised. In this space, it is necessary to mainstream the industry and ensure that the livelihoods of all people dependent on this industry are supported and upgraded.

Strategy and Key Recommendations

Organised Waste Management and Recycling

- Development of a National Waste Management and Recycling Programme
 - This is an overarching framework to create and mainstream the organised waste management and recycling industry.
 - Structured frameworks and guidelines for recycling industry to be developed to integrate it with the existing waste management rules and guidelines.
 - Development of industry and sector specific recycling standards.
- Promotion of PPP model for waste management and recycling
 - Establish facilities for reuse, recycling and reprocessing of wastes from various sectors should be encouraged by providing incentives and ensuring the process for setting up PPP facilities.
- R&D funding
 - Promoting new technologies and processes for waste management and recycling.
 - This should be aligned with the overall technology fund as discussed earlier.
- Building institutional capacity
 - Local institutional bodies must have their capacity built on recycling and waste management.

Creation of a Green Technology Fund

- For usage in three key areas: technology upgradation, promotion of green entrepreneurs and funding for R&D.
- This could be disbursed in the form of concessional loans, grants and so on.
- This fund should be a part of the overall technology fund proposed for improving depth in manufacturing and must ensure focus on commercialisation of new technology areas.

Promotion of Green Products

- Development of a framework and guidelines for promotion of green products
 - Definition of the specifications
 - Creation of/assignment of a new/existing entity to perform this task on a regular basis
 - Identification of top 100 green products (based on assessment of maximum environmental impact) and setting of standards for the same
- Promoting green public procurement through price incentives on Government tenders
- Encourage and develop voluntary rating programmes
- Creation of centres of excellence to promote green products and processes
- Incentive programmes for creation of Life Cycle Inventories
- Incentives for export of green products

Environmental Regulatory Reforms and Market Based Instruments

- Strengthening regulatory institutions together with bringing institutional reforms
 - Moving towards load-based standards from concentration based regime.
- Implementing polluters-pay principle, with specific pollution loads beyond a defined benchmark should be priced and paid for by industry.
 - Reforming the existing environmental clearance process.
 - Institutionalise the concept of cumulative impact assessment of the region.
 - Introducing technology assessment while appraising new projects.
 - Process for administering the clearances needs to be streamlined—should include considerations of decentralisation, requirements and tenure of clearances.
- Establishing integrated chemical-management policy and regulatory regime
 - Set up a regulatory process to assess all chemicals, register and phase-out toxic chemical products and replace them with non-toxic/less-toxic substitutes.
- Market-based instruments and emission trading
 - Initial pilot Emissions Trading System to limit particulate matter emissions.

- Scale up the emissions market to address additional pollution problems at the State and national levels.
- Monitoring technology for all types of pollutants be made as affordable as possible for industry; waiving of applicable taxes and excise duties, as well as direct subsidies to monitoring technology wherever their installation is mandated by the State pollution boards.

Sustainable Environment Management in MSMEs

- Reconstitution of regulatory bodies
 - Inclusion of stakeholders/associations.
 - Sector-wise product sub-groups need to be formed as part of PCBs.
 - Grievance Redressal Mechanism should be established at each PCB.
- Creation of common infrastructure for MSMEs in clusters
 - Central Grant Scheme for soft infrastructure, unit level technology upgradation assistance, portion of project cost for Common Effluent Treatment Plants.
 - State Grant Scheme with provision for arranging land for CETPs, time-bound speedy legal clearances, provision for equity participation in SPVs by SPCBs/State agencies.

Disclosure on Performance

- Short-term action to increase voluntary disclosure of environmental sustainability performance.
 - Development of reporting standard-based on several existing sustainability reporting initiatives.
 - Incentives for voluntary disclosure.
- Long-term steps to compare environmental sustainability performance of organisations with industry-specific benchmarks.

Development of Environment Sustainability Benchmark Index, Especially for Identified Highly Polluting Sectors

Organised Waste Management and Recycling

- As covered in the chapter on Environment, the development of a National Waste Management and Recycling Programme and the promotion of

PPP model for waste management and recycling are required.

WATER ISSUES

13.120. With its increasing population and industrial activity, India is moving towards perennial water shortages. The current per-capita water availability is estimated at around 1,720.29 m³ per capita according to data from the Central Water Commission and as per the World Water Development Report—one of the United Nations, India has been ranked 133 (Out of total of 182 countries) in terms of total renewable per capita water resources.

13.121. The total water demand is projected to increase by 22 per cent by 2025, and 32 per cent by 2050. A major part of the additional water demand will come from the domestic and industrial sectors. The water demands of the domestic and industrial sectors will account for 8 per cent and 11 per cent of the total water demand by 2025.

Key Objectives

- Improve the governance and management of water in order to ensure availability of water for all purposes.
- Improve the management of water by industry, in particular in terms of utilisation and pollution.

Status and Key Challenges

- Inadequate storage capacity
- Governance deficit and fragmented institutional framework
- Inadequate water management by and for industry
 - Water intensity high as compared to global benchmarks—to the extent of ~30–50 per cent.
 - Recycling water in industry is not common and its proliferation is not happening at the scale as required.

Strategy and Key Recommendations

13.122. Strategy on improving overall governance and management of water has been covered in detail in the section on Water Resources. The proposed draft National Water Framework Bill will provide the broad overarching national legal framework of

general principles on water which will necessitate the requisite administrative frameworks needed for greater clarity on demand management, protection of water resources, improving efficiency of water use and so on.

13.123. Specifically, strategic measures to ensure availability for and efficient utilisation of water by industry have been outlined below.

Water Management in Industry

- Create equity-based and efficiency-based Water Pricing Regime for industries
 - Overcome lack of a clear policy framework based on cost-recovery principles.
- Current pricing regime is undervalued for all users.
- This would overcome wide variations in tariff structure due to current determination by various States.
- All Indian cities currently operate a mix of measured/metered or unmeasured/unmetered tariffs.
 - Potentially two different pricing regimes in two-tier tariff system/IBT tariff system.
- Enforce ‘Water returns’
 - Annual return to be filed by water users on similar lines of tax returns—should include key measures like water utilisation per unit produce, effluent discharge details, rain water harvested, water reuse details, fresh water consumption and so on.
 - Mandatory for major water using industries and businesses.
- Promote reuse and recycle of wastewater in industry
 - Regulations and incentives through national frameworks and a system of water returns
- Industry specific standards
 - Promoting rain-water harvesting in industry, both within and beyond the fence through incentives and regulation.

LAND ISSUES

13.124. Among all the traditional factors of production for any economic activity, land being natural, immovable and non-renewable, is a distinct resource.

It needs to be looked at from Industry’s perspective as a tangible resource with supply and demand issues and the linkage in the form of land acquisition for industrial demand.

13.125. Land in India has a special significance because it carries a huge tangible and emotional value for owners and also for those whose livelihoods depend on it. This makes it very important to consider the land acquisition process in a critical manner.

Key Objectives

13.126. The key objectives with regard to solving the various issues and challenges related to land pertain to:

- Improving the management of land as an asset in India.
- Setting up a more transparent, fair and efficient process of land acquisition for industry development.

13.127. By achieving these key objectives, we would be able to ensure a more productive utilisation of land, and in particular, be able to spur industrial development, which has in many instances been hindered as a result of poor land management and land acquisition processes.

Status and Key Challenges

13.128. India has sufficient land for all uses—agriculture, industry, human dwelling, infrastructure and other uses—as long as it is used with prudence and productivity. Currently industry utilises only about 2–4 per cent of all land in India. Even at heightened industrial activity in the future, it is expected that there would be sufficient land for all users, including industry. However, there are some critical issues that need resolution in order for land to become a well-managed resource, especially from the point of view of Industry.

13.129. Land is inherently an imperfect market, because land is an immobile asset. Hence, no two pieces of land are alike and can be differentiated. This gives rise to a monopolistic power with the

landowners. Furthermore, the value of a piece of land effectively changes when we change its usage and due to development of surrounding areas. In addition, the owner is often emotionally attached to his land. In India, land is considered a very important asset from an emotional perspective.

13.130. A major characteristic of land ownership in India is that the land holdings are typically small. Typical industrial usage requires development of large tracts of land. Consequently, industrial development has as a prerequisite need to acquire land from a large number of owners in order to develop a contiguous piece of land for industrial use.

13.131. Another problem in the land market is the incomplete, outdated and inaccurate land records, which give rise to disputes and litigation. Since industrial projects require large amounts of land and land holding in India is fragmented, industrialists have to deal with a large number of landowners and consequently face substantial risk of litigation.

13.132. In addition, there are some restrictions on usage of agricultural land for non-agricultural purposes. Non-Agricultural Use Clearance (NAC) from the local/State Government is necessary before agricultural land can be considered for other uses.

Strategy and Key Recommendations

13.133. A three-pronged approach should be undertaken for tackling the land issues. This includes the development of an institutional framework to support the various actions, a drive to create Land Use Policies to manage land better, and a reformed process of land acquisition (Figure 13.5).

13.134. A *National Land Use Policy* should be developed to take care of the growing requirements of land for sectors other than agriculture. *State Governments* should formulate appropriate *Land Use Policy* in alignment with the National Land Use Policy. The main features of this policy should be *Land Mapping* (record of types and quanta of land available), *Land zoning and Digitisation of Land Records*. The Land

3-part strategy to tackle land issues

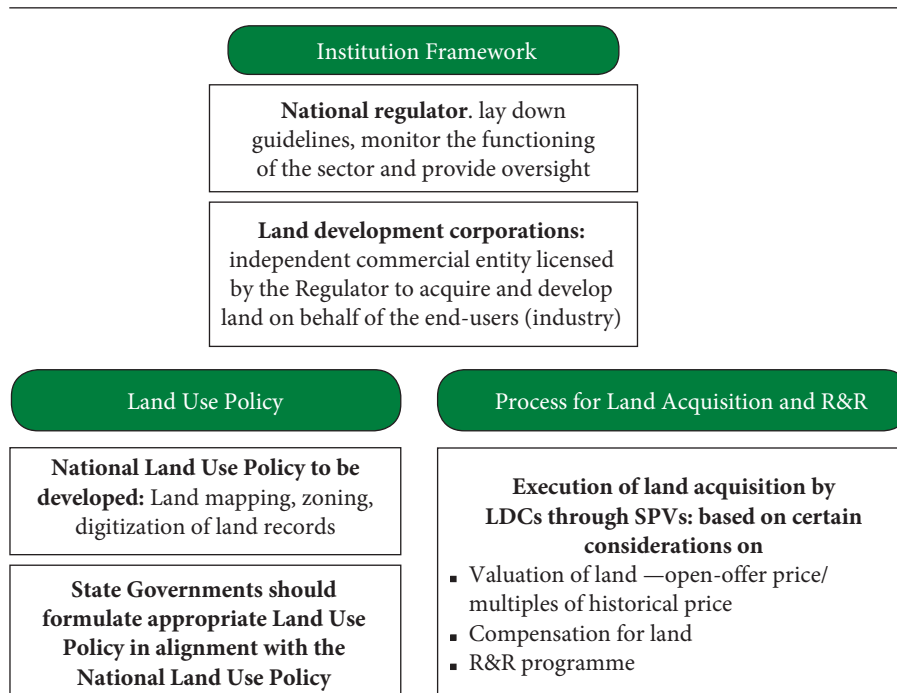


FIGURE 13.5: Strategy for Land Issues

Use Policy should also look at measures to optimise utilisation of land by benchmarking current utilisation efficiency with global benchmarks, and setting standards and incentives for more efficient utilisation.

- There is a need to establish an independent and autonomous regulator which can lay down guidelines, monitor the functioning of the sector and provide oversight. The regulator should
 - encourage State and local Governments to define zoning of land, ear-marking them for different uses, and encourage digital land records
 - define guidelines for valuing various types of land for different uses
 - Establish norms for setting up and operating Land Development Corporations (LDCs) and monitor adherence to the norms by these institutions
 - lay down the guidelines for acquiring land by a corporate body
 - establish norms for process of land acquisition, compensation and relocation and rehabilitation of various stakeholders for different project characteristics
- *Value of land* can be determined, as per the guidelines laid down by the regulator, in the following ways:
 - *Open-offer price*: Land owners will be asked to submit their application for sale of land in a reverse-auction process.
 - *Multiple of historical price*: The regulator can set a price based on a multiple of the historical land prices, as mentioned in the land records of the government.
- The acquiring agent for land should be an independent commercial entity—Land Development Corporation—that has been licensed by the regulator to acquire land. The role of LDC would be to acquire and develop the land on behalf of its clients (end users) in exchange of the process and maintenance fee. A State can have multiple LDCs and each LDC will execute projects through SPVs. The operations of the LDC will be under the purview of the regulator.
- The *process of land acquisition* will be guided by the regulatory framework applicable for the project characteristics as defined by the LDC in its SPV. The role of local/State Government authorities in supporting the acquisition process should be laid out clearly by the regulator based on project characteristics. The acquisition process may vary depending upon
 - minimum per cent that the SPV needs to acquire from individual landholders before regulation mandates compulsory acquisition of land from other owners
 - nature of consent required from different stakeholders
- *Compensation for land* needs to factor the following:
 - upfront payment
 - annuity income stream
 - participation in the future appreciation due to growth as a result of land development

In addition to the above factors, the land owner needs to have the flexibility to choose a compensation package

 - an owner can choose to take the full value in upfront compensation or take a part of it as annuity payouts (determined by prevailing financial indicators of the time)
 - however, every land owner will necessarily have the component of ‘participation in future appreciation’ as part of the compensation
- The *LDC has to operate a rehabilitation and resettlement programme* with combination of different elements which have been defined by the regulator based on the project characteristics; these include elements like.
 - alternative dwelling, if displaced
 - skill development
 - assistance in employment/income-generating opportunities
 - community development
- The *Industry* must be *responsible for payment of cost of land acquisition*, including market price, share of the appreciating value and cost of the comprehensive R&R.
- There should be a *timeframe defined for land acquisition*, and the LDCs must *interface*

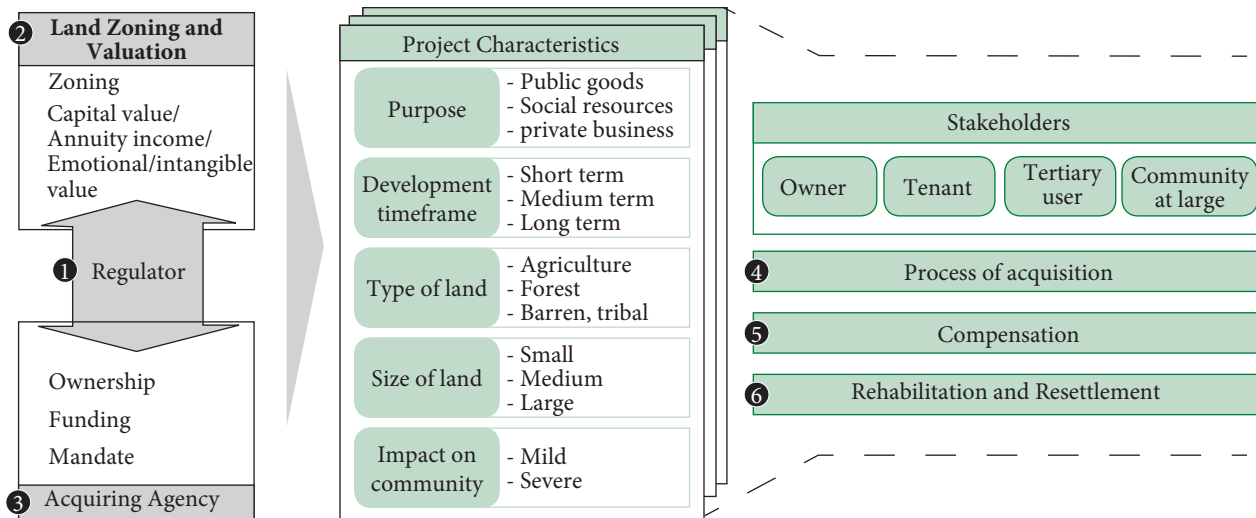


FIGURE 13.6: Description of Land Acquisition Process

appropriately not only with the local self-governance bodies, but also other grass-root level organisations in order to build awareness about the land acquisition process.

13.135. A description of the process of land acquisition, the role of the institutional framework and the other modalities related to land acquisition is provided in Figure 13.6.

CLUSTERING AND AGGREGATION

Introduction

13.136. Industrial clusters are increasingly recognised as an effective means of industrial development and promotion of small and medium-sized enterprises.

Status and Key Challenges

- For MSME participants, clusters play an important role in their inclusiveness, technology absorption, efficiency improvement and availability of common resources. Ministries dealing with MSME enterprises have been using Cluster programme as one of the key policy tools in administering Industrial Policy. There are around 7,000 clusters in traditional handloom, handicrafts and modern SME industry segments.

- The Ministry of Micro, Small and Medium Enterprises (MSMEs) adopted the cluster approach as a key strategy for enhancing the productivity and competitiveness as well as capacity building of small enterprises (including small scale industries and small scale service and business entities) and their collectives in the country. The Ministries have been administering hard and soft interventions to help the cluster participants. While hard interventions will include investments in infrastructure like common facilities, common testing centres, roads, the soft intervention will include training, capacity building, skill improvement, marketing inputs, product design and development and so on.
- In order to assess the level of intervention required, MSME Ministry has carried out a diagnostic study of about 471 clusters. However, the follow-up on these studies have been weak.
- Today, the cluster programmes are administered by various ministries (textiles, leather, food, MSME, heavy industry [auto]) under various names with different terms and conditions. This apart from putting the cluster participants through procedural hurdles also makes it very tough to learn from each other and improve the efficiency of these schemes.

- Though many of the cluster schemes make it mandatory to have an SPV, a Project Management Agency and Cluster Associations, the capacity of these aggregators needs urgent improvement. These cluster aggregators provide the crucial link between the Ministry and the cluster participants. The cluster aggregators also need to have soft skills required to impart a vision to cluster participants, and see beyond their immediate requirement.
- The current amount allocated for soft interventions is grossly inadequate.
- The current cluster initiatives are mainly focused towards MSME Sector. Other industries can also benefit from cluster programmes as demonstrated by the automotive industry clusters.
- There is a deficit of trust between the various participants in clusters today, which needs to be addressed.
 - Building innovation at cluster level
 - Suggesting fiscal incentives to provide to clusters
 - Increasing competitiveness of cluster players
 - Effectively leveraging the common facilities

13.137. However, the effectiveness of the CSCs depends entirely on the way they are structured and run. If CSC is set up as a hierarchical organisation controlling clusters, it will lead to suboptimal results as the line ministries are the best agencies for implementing cluster programmes. On the other hand, If CSC is structured as knowledge organisation, with the responsibility of enabling clusters to improve their performance, CSCs can play an effective role in improving the performance of clusters across the country.

13.138. Today there are several agencies playing critical roles in developing and supporting clusters:

Strategy and Key Recommendations

- It may be desirable to set up a Cluster Stimulation Cell (CSC) at apex level (to be located in DIPP/NMCC) to monitor the performance of clusters and share best practices across them. The CSC should also develop a cluster manual which may define clusters, development strategies adopted across the clusters, share best practices and develop a communication channel. The constitution of a CSC will considerably reduce the coordination problems across the clusters and within clusters across different sectors. The CSC should.
 - Implementing ministries like MSME, Textiles, Leather, Food Processing and Heavy Industries
 - State Governments
 - Department of Science and Technology and National Innovation Council in the areas of technology upgradation and innovation
 - Undertake mapping of clusters to identify the key bottlenecks and the means for overcoming the same. It would also enable devising an appropriate strategy and support mechanisms for including the clusters in the growth trajectory.
 - Maintain information about all the clusters along with the cluster participant profile, employment generated and so on.
 - Evaluate the performance of these clusters on predetermined range of various performance parameters.
 - Identify best practices and ensure sharing the best practices across clusters, in areas like
 - Building trust among participants
 - Cluster branding
- 13.139. Normally, clusters, especially for MSMEs, develop on their own and Government may play a facilitating role to accelerate their growth. However, going forward the State Governments should have devolved powers to create clusters while the Central Government's role should be to stimulate learning across the system. Hence, the CSC is envisaged as knowledge partner to these agencies. The roles of CSC will complete a crucial missing link in the cluster support ecosystem.
- Provide assistance to State Governments in the cluster formation through strengthened DICs at district level besides NGOs and reputed institutions that have capacity to undertake this type of work.
 - Develop strategies for growing different types of clusters (for example, hub-and-spoke, MSME, high tech and so on) for the different sectors.

- The CSC should undertake this exercise and include details on the approach to be employed for each type of cluster and sector.
- The scope of soft interventions should be expanded to include capacity building of Cluster associations, initiatives aimed at improving market linkages, improving product quality, improving access to credit, encouraging innovation, skill development and so on.
- The allocation of funds for soft interventions should be increased accordingly.

PROMOTING MSMEs

13.140. The Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last few decades. It is estimated that this sector contributes about 45 per cent of manufacturing output and 40 per cent of total exports of the country and employs about 69 million persons in over 29 million units throughout the country. Within the MSME Sector there is a significant concentration of Micro Enterprises, both in terms of working enterprises and employment (refer to Table 13.6). There are over 6,000 products ranging from traditional to high-tech items manufactured by the MSMEs. The sector also covers the enterprises established in khadi and village industries and coir sector (plans for these sectors are detailed in Annexure 13.3).

TABLE 13.6
Registered MSMEs—Manufacturing

	Micro	Small	Medium
Working Enterprises	94.9%	4.9%	0.2%
Employment	69.2%	26%	4.8%

13.141. Recognising the contribution and potential of the sector, the definitions and coverage of MSE Sector have been broadened significantly under Micro Small and Medium Enterprises Development (MSMED) Act, 2006 (refer to Table 13.7). Service sector, an important emerging sector, has also been included under this Act, depending on its category into Micro, Small and Medium Enterprises. The criteria of investment limit in plant and machinery is the only parameter, used to categorise the enterprises in the sector in the country.

TABLE 13.7
Definition of MSME

Nomenclature and Classification of MSME (Manufacturing)	Ceiling on Investment in Plant and Machinery (in INR)
Micro	25 lacs
Small	5 crore
Medium	10 crore

13.142. It is important to recognise though that a broad band of differentiation exists within the MSME Sector across indicators such as turnover, employment and so on. Further discussion on MSMEs also needs to specifically address organised and unorganised segments. Classification based on investment in plant and machinery only superficially institutes a numeric threshold for describing a funnel of growth. Schemes and interventions based on such concretised classifications, however, may not be able to necessitate real growth as such definitions create perverse incentive structures that might thwart firms from graduating from small to medium, such as service tax exemptions for firms with less than 10 lac revenue, exemption from central excise duty for firms with an annual turnover of less than ₹1.5 crore and so on.

Key Objectives

13.143. The objectives for the MSME Sector are:

- Promoting competitiveness and productivity in the MSME space
- Making the MSME Sector innovative, improving technology and depth
- Enabling environment for promotion and development of MSMEs
- Strong presence in exports
- Improved managerial processes in MSMEs

Status and Key Challenges

13.144. MSME Sector has been consistently registering a higher growth rate than the overall growth of the industrial sector. During the first four years of the Eleventh Plan, MSME Sector exhibited a growth rate of 13 per cent on an average. There are some inherent challenges faced by the sector which have a strong impact on its growth. These

relate to (i) availability of credit and institutional finance (ii) outdated technology and innovation, (iii) need for skill development and training, (iv) inadequate industrial infrastructure, (v) marketing and procurement.

13.145. The Plan explores various aspects of MSME Sector, relating to the growth of the sector. These may be classified under six important verticals to provide theme-based focus, while devising any strategy for the sector. These are (i) finance and credit (ii) technology (iii) infrastructure (iv) marketing and procurement (v) skill development and training (vi) institutional structure, however, keeping in view of the unique status of the khadi and village industries and coir sector in the Indian economy, it was decided that there will be separate recommendations for these sectors. Similarly, concerns of unorganised sector and special areas and groups would be given due consideration while formulating any programmes/schemes under the aforementioned six major verticals.

Strategy and Key Recommendations

Credit and Finance

13.146. Credit is a crucial input for promoting growth of MSME Sector, particularly the MSE Sector, in view of its limited access to alternative sources of finance. Access to information, simplification of loan procedures and interest subvention for micro enterprises are enabling features for timely and affordable credit to MSMEs. The Plan should provision resources for promoting e-platforms for information flow and simplification of procedures. To address the risk perception of banks, particularly for lending to MSEs, the Credit Guarantee Scheme needs to be strengthened, with enhanced budgetary support. There should be substantial increase in the number of MSEs covered under the Performance and Credit Rating Scheme which is a facilitating factor for easy access to credit with liberal terms.

13.147. The reach of the MSEs to the banking network has to be substantially enhanced through setting up of branches near clusters. While there has

been an effort to facilitate credit to clusters by financial institutions such as SIDBI, reach and thereby coverage needs to be increased. In fact, a cluster-centric approach is the best bet for addressing the credit needs of the MSME Sector because of reasons of operational convenience and trust building.

13.148. Access to finance needs to be enlarged through alternative sources of capital such as private equity, venture capital and angel funds. This is crucial for facilitating the growth of knowledge-based enterprises which have high potential in the Indian context. Further, prospective enterprises in emerging areas such as nanotechnology, biotechnology, aerospace and defence applications would also require such alternative sources of finance since traditional channels are unable to meet their needs.

13.149. There has to be aggressive market intervention, such as promoting companies for market making and ensuring scaling up of operations of SME exchange. The Plan has to provide resources for such market interventions.

Technology Upgradation and Support for Emerging Sectors

13.150. Technology will be the foremost factor for enhancing the global competitiveness of Indian MSME Sector. The Prime Minister's Task Force on MSMEs has identified low technology, generally used by the MSME Sector, as a major cause for poor competitiveness of the sector. Strategies for improving technological capability of MSMEs have been previously discussed in the section on improving technology and depth in domestic manufacturing.

13.151. The main focus needs to be on developing appropriate technologies for various manufacturing processes to bring down cost, develop collaborations between private and public sector on boosting R&D, and facilitate absorption of globally competitive technologies. Also, separate schemes of the ministry for installation of plants and equipment's with advanced technologies viz. CLCSS and NMCP components may be merged into one scheme, skill development and capacity building.

13.152. Lack of skilled manpower and information as well as lack of reach to modern technology are affecting the growth of the MSME Sector. Among its major recommendations, the Prime Minister's Task Force has identified lack of skilled manpower as a road block for the growth of the MSME Sector. The Ministry of MSME has been mandated to provide skill to 42 lakh persons during the Twelfth Plan period. Strategies for this, including enhancing training capacities for skilling and industry-led skilling and training programmes have been covered previously in the Human Resources Development Section.

Infrastructure Development

13.153. Cluster-based intervention has been acknowledged as one of the key strategies for comprehensive development of Indian industries, particularly the Micro and Small Enterprises (MSEs). The Ministry of MSME has adopted the cluster approach as a key strategy for enhancing the technical and physical infrastructure as well as capacity-building of micro and small enterprises and their collectives in the country. Since 1994, Ministry had also been supporting creation and upgradation of industrial infrastructure in the States under Integrated Infrastructural Development (IID) Scheme, which was subsumed under MSE-CDP in October 2007.

13.154. Land and infrastructure constraints are a major problem, particularly in metros and bigger cities. As production processes of majority of MSEs can be accomplished in flatted factories, flatted factory complexes may be encouraged by providing financial support likewise. Accommodation problem of industrial workers may be addressed to a great extent by supporting dormitories (in or around industrial estates/areas). SPVs may run the dormitories on sustainable basis.

13.155. Maintenance of industrial estates (mainly maintenance of roads, drainage, sewage, power distribution and captive power generation, water supply, dormitories for workers, common effluent treatment plants, common facilities, security and so on) is a critical component for successful functioning of the industrial enterprises in any industrial estate/ industrial area. It would be appropriate to handover

maintenance of industrial estates to the industry associations, local bodies, State Government agencies, SPVs on self-sustaining basis. World over high-tech and innovative enterprises start in Modular Industrial Estates. To encourage such ventures, modular industrial estates are proposed to be set up near centres of excellence like IITs.

13.156. The Cluster Development Programme of the Ministry of MSME (MSE-CDP) may be continued in the Twelfth Plan period with streamlining of interventions and also ensuring the sustainability of clusters developed. The Programme should also address the requirements of the large unorganised manufacturing sector.

Marketing and Procurement

13.157. Marketing and procurement are the other areas where MSMEs face more challenges than opportunities. The challenges range from procurement of raw materials to lack of market information. MSMEs face several constraints in the marketing and procurement front due to their limited manoeuvrability in such wide ranging activities either on account of lack of finance or on account of lack of awareness. While marketing of products of MSMEs mostly depends upon the market forces and individual efforts of the enterprises, Government and its organisations can play the role of a facilitator to help MSME Sector in these endeavours.

13.158. There are multiplicity of market development assistance programmes to support MSMEs, like participation in domestic and international trade fairs, bar coding, packaging and standardisation within the Ministry. There is a need for rationalisation and consolidation of such programmes under different broad heads.

13.159. However, schemes especially in areas of use of ICT for creating cluster-level, State-level and national-level B2B portals with connectivity to international markets and marketing infrastructure may be required in the Twelfth Plan such as setting up of testing facilities and establishment of information dissemination centres and display-cum-exhibition centres.

13.160. The plan allocation for such schemes can be made under the infrastructure vertical and technology vertical (ICT Scheme), respectively. The vacant land available in the premises of MSME DIs and DICs can be put to use for construction of display-cum-exhibition centres and establishment of information dissemination centres.

13.161. Setting up of marketing organisations in clusters in PPP mode through formation of SPVs, which would form the focal point at the cluster level for all marketing-related activities, such as e-marketing, branding, advertising, barcoding and so on could be considered in the Twelfth Plan.

13.162. National Small Industries Corporation (NSIC), the autonomous outfit of Ministry of MSME may be the apex organisation to coordinate market development activities under different schemes.

13.163. The Government has recently introduced a Public Procurement Policy for the MSME Sector. Further, there is also need for inclusion of private sector in the procurement policy for the MSME Sector. An offset under defence purchases has vast potential for MSME Sector. There is need for setting up a mechanism in the Ministry of Defence to ensure that the offsets under defence purchases are suitably focused to support SMEs in upgrading their capacities.

13.164. All new and existing schemes should be merged into one scheme, namely Marketing Development Assistance Scheme.

Institutional Structure

13.165. The Institutional and legal framework for promotion and development of Micro, Small and Medium Enterprise (MSME) Sector of India is spread both at the National and State level. The primary responsibility for the development of MSMEs lies with the State Governments and Government of India supplements their efforts through a range of initiatives. The Prime Minister's Task Force in its report have made significant recommendations on liberalising the policy regime for the MSME Sector, viz. introduction of insolvency act, liberalisation

of labour laws, liberalisation of apprenticeship act, strengthening of district industry centre and so on.

13.166. The following issues need to be immediately addressed to unshackle the growth of the MSME Sector (i) environmental issues, (ii) labour issues, (iii) exit policy, (iv) amendment of MSMED Act (v) restructuring of the DICs and MSME-DIs.

13.167. On the environmental issues, it is recommended that policies be made uniform pan-India with appropriate relaxation of the controls for the MSMEs. Regarding the labour issues, the immediate need is to consolidate the plethora of labour laws and acts into one user-friendly law. The enactment of Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 is a harbinger for the growth of the MSME Sector. However, there is an urgent need to strengthen the various provisions of the Act along with enactment of the rules under the various sections.⁴

13.168. However, the implementation of the process of filing of Entrepreneurs' Memorandum is still very tardy. Application of e-governance for streamlining of the procedures and for that purpose setting up of an information and database network among the DICs, MSME-DIs and the Ministry may be considered.

13.169. The provision regarding the delayed payment under the MSMED Act was another facilitator for ensuring regular cash flow to the micro and small enterprises against the supplies made. The Micro and Small Enterprises Facilitation Councils (MSEFC) stipulated under the Act to be set up at the State level where foreseen as facilitators to the MSEs.

13.170. However, most of these MSEFCs are not operating efficiently. In fact, in some States they are yet to be constituted. The group recommends immediate action for upscaling the activities of these MSEFCs and introduction of an information and communication network for operation and monitoring of these MSEFCs. A budget of ₹100 crore may be allotted for ICT enabled upscaling of the EM filing and MSEFC operations.

THE UNORGANISED SECTOR

13.171. The Prime Minister's Task Force on MSMEs have stated that no discussion on MSME can be completed without a full treatment of the unorganised sector. More than 94 per cent of MSMEs are unregistered with most of them being in the informal/unorganised sector. The Task Force has commented that in addition to the growth potential of the sector and its critical role in the manufacturing and value chains, the heterogeneity and the unorganised nature of the Indian MSMEs are important aspects that need to be factored into policy making and programme implementation.

13.172. Policies/programmes for the larger sized MSMEs need to address issues relating to growth, marketing, access to raw material, credit, development and technology upgradation. Programmes for the micro and small enterprises in the unorganised sector need to address similar issues for improving their productivity and competitiveness. In addition, they must address requirements of social safety nets for workers in these, more vulnerable enterprises. The future strategy should focus on providing social security to the unorganised workers in the MSME Sector in terms of the mandate under Unorganised Workers Social Security Act (UWSSA).⁵

13.173. The policies for the MSME Sector would have to be devised especially in the areas of skill formation and credit and technology upgradation, and should meet the special needs of the informal sector. Instead of consigning these responsibilities to other departments, the Ministry of MSME will have to actively provide an enabling environment for the unorganised sector to flourish and integrate with the organised sector. Towards this, it is suggested that separate approaches/schemes for the unorganised sector be built into the broad verticals—credit, technology, skill formation and so on. For example, some of the important suggestions can be incorporated into the flagship MSE-CDP Scheme as these can be done on a cluster basis. Apart from this, the Ministry may work out the modalities of how enterprises in the sector can be registered.

BOOSTING MANUFACTURING EXPORTS

13.174. In order to achieve the desired growth rate for the manufacturing sector, it is necessary to have a high growth rate for the country's exports as well. Considering this, the Department of Commerce has come up with a strategy paper on doubling India's exports.

13.175. The recent spiral of exchange rate depreciation of Rupee, while has exerted pressure on imports, has made Indian goods more competitive in international markets. However, this has not materialised into a much needed spurt in exports, largely due to falling global orders and declining domestic demand on account of rising prices, especially of fuel. Over time, repricing of Rupee, if sustained, will incentivise domestic manufacturing. However, it is important to consider that demand for two of India's biggest imports, oil and gold, is not as sensitive to prices. Exchange rate depreciation will therefore have to be supported and balanced by fundamental changes in the ecosystem that can sustainably boost Indian exports and also overall domestic manufacturing.

Key Objectives

- Accelerating the rate of growth of manufacturing exports
- Building a brand image for Indian products
- Increasing technology intensity of products being exported from India

Status and Key Challenges

- Low level of production
 - Output is the most important determinant of exports. Therefore, quantum, quality and competitiveness of domestic manufacturing is very important for export performance of the manufacturing sector. Unfortunately, India's manufacturing is growing at a very low rate as compared to other developing countries.
- Very low share of high tech exports
 - High-tech products have better terms of trade due to high income elasticity. However, India's share in the global trade of high tech products is very low, and has been between 5–8 per cent during 2003–09.

- Non-tariff barriers being placed by countries
 - There is a lack of information and clarity on procedural norms and regulations of various countries regarding specification as well as methods of sampling, inspection and testing. Several conformity assessment issues also have the effect of restricting trade.

Strategy and Key Recommendations

13.176. For achieving the above mentioned objectives, a stable and comprehensive policy for promotion of exports is required. Following specific action points can be considered for achieving the above mentioned objectives:

Accelerating Rate of Growth of Indian Exports

- Providing world-class infrastructure at ports and airports. For promoting exports, adequate infrastructure at all major ports and air ports is required. Further, deepening of draughts at berths, anytime working in ports, deployment of shore mobile cranes for cargo, LPG and CNG connection through pipes, and making them available in every town are also required.
- Dedicated export berths for automobile industry at Chennai port and one more port on west coast, equipped with facilities to handle ~5l vehicles by 2010 and space for parking are required.
- Ranipat, Gurgaon and Unmao should be notified as town of export excellence as this would enhance infrastructure development there.
- Providing an enabling mechanism for facilitating exports is required.
- Reduction of transaction cost for exporters
 - Export procedure to be simplified and human interface with exporters to be reduced
- Addressing non-tariff barriers to ensure fairness to exporters
 - Indian standards need to be in line with international standards and technical regulations
 - Review of our existing standards and their benchmarking with international standards is required
 - More improved labs with international accreditation
- Reform of the FTA process to include improved consultative process with stakeholders

- Include better input taking mechanism from industries and associations
- Improving fiscal incentives to exporters
- Attracting FDI in country
 - Linking FDI investment with market access and giving preferential incentives for investment in areas where Indian domestic market is non-existent
 - Reduction of threshold limit for offset obligation should be considered
- Ensuring availability of funds to exporters
 - For example, reduction in ECGC premium, availability of pre-shipment and post-shipment credit
- Market strategy to capture unexplored markets and products
- Move to higher value-added products exported to traditional markets
- Focus on Asian and African countries
 - Market access through quota system should be negotiated with competing countries
 - Conducive trade agreements need to be put in place
- Focus on globally dynamic products
 - Products which are gaining significant share in global trade

Building a Brand Promotion Strategy to Coalesce the Brand Values of the Indian Manufacturing Sector

- Initial survey of existing product-promotion strategy and product perception—through IBEF
- Initiate study to benchmark Indian products with competitors in terms of quality and price; all stakeholders should be consulted in this exercise
- A logo and a standard brand kit should be developed
- Focus required on strong PR initiative
 - Participation of Government and industry should be ensured at major national and international trade fairs, seminars and exhibitions

Focus on Moving Towards 'High-tech' Exports from Current Low Tech Exports

- Identify the sectors having high technology and high export growth potential

- Frequent consultations among export promotion councils, industry associations and major technology agencies required
- CII is already in partnership with many agencies for development of technology. Department of Commerce may partner with these efforts to assist R&D for manufacturing exports
- Need to focus on measures to promote these identified sectors

REFORMING THE ROLE AND MANAGEMENT OF PSEs

13.177. Public-sector enterprises occupy an important space in manufacturing. While PSEs like SAIL and BHEL have performed very well in competition with private-sector enterprises, there are also many PSEs that have performed very poorly. In an economic environment that has changed considerably since the early days of India's post-Independence development journey, the need for PSEs as well as the systems for their governance and management should be re-evaluated. Considering this, the Roongta Committee was set up to examine a range of issues of the PSEs and suggest a roadmap for reforms and further development of these enterprises.

13.178. Major recommendations of the Roongta Committee are given below

Strategy and Key Recommendations

13.179. A fundamental problem facing CPSEs which inevitably affect their performance is that they are expected to compete in the market with private-sector companies while having much less freedom of manoeuvre. To deal with this problem it is necessary to consider some fundamental changes as outlined below:

Change in Corporate Governance Structure in CPSEs

- Setting up a strategy and business development committee by every CPSE Board. The committee needs to set direction for the company towards diversification, acquisition, joint ventures, new business entry and review of organisational structure and so on.
- Introduce a system of annual self-evaluation for board of CPSEs.
- Changing the board composition to have 50 per cent board members as independent directors.
- Role of Government director should be equivalent to independent directors on matters where Government has no views as Government. These directors should be paid sitting fees for attending board committee meetings. Their evaluation should also be based on their performance as Directors of board of CPSEs.
- Reform the process of selection of independent directors to make the process more efficient. For this DPE/PSEB can formulate a panel of approved names, out of which independent directors can be appointed for CPSEs. Full-time CEOs of successful enterprises should also be eligible to be appointed as independent directors provided there is no conflict of interest.
- Streamlining the process of appointment of CMDs and full-time directors, in particular the mechanism of obtaining vigilance clearance Process of selection of CMDs/CEOs of Maharatna and Navratna Companies to be different from current process. A separate body may be constituted within PSEB and the selection criteria should be more focussed on leadership quality, strategic thinking, capability to manage external environment and so on, apart from domain/sectoral expertise. Selection of CMD should be made three months before the term of incumbent CMD. Vigilance-clearance process also needs to be reformed in line with the previous point.
- Tenure of CMD/Functional director should be minimum made three years irrespective of the age of the person.
- Reforming vigilance function in CPSEs.

Change in Human Resource Strategy for CPSEs

- All CPSEs should undertake a comprehensive manpower planning exercise to identify key skill and talent requirement across all levels within an organisation from a medium term and a long term perspective.
- CPSEs should develop a leadership pipeline for its key positions and a leadership development strategy.
- To fill the immediate gaps at the higher level in CPSEs, an extension of two years may be allowed

at DGM and above level, subject to certain conditions.

- Autonomy in recruitment policy.
- Autonomy in compensation policy.

Review of Memorandum of Understanding for CPSEs

- Current MOU System to be modified and greatly linked to the organisation's approach towards diversification, acquisition, formation of JVs, new/strategic business, usage of ICT, R&D initiative, HR development and organisational changes.
- Physical performance parameters, if included in MOU should be benchmarked with industry parameters including those in private sectors. CPSEs should be encouraged to reach to these standards within a defined timeframe.

Joint Ventures, Public-Private Partnership and Procurement

- CPSE board should be empowered to select the partner for JV and companies for acquisition.
- Process of entering into partnership and JVs need to be simplified. Current restriction of minimum ownership of 51 per cent in case of JV to be done away with.
- Disinvestment through privatisation of loss making CPSEs may be considered.
- Creation of a Public Sector Land Development Authority for the purpose of developing surplus lands with CPSEs and unlocking their real value.

Technology Mapping for CPSEs

- Every CPSE to have a technology policy, clearly indicating the commitment of the enterprise in using/sourcing/developing type of technology as per needs of the organisation.
- A technology committee may be set up in every CPSE to identify the technology needs and finding alternative ways of developing or finding such technology.

13.180. There is a need for changing the governance model for CPSEs in sectors in which private-sector investments are not forthcoming. Government should be able to enter or exit from any such investment in good time. Otherwise, the benefit of

Government investment in the industry is missed or Government's investments, when they have outlived their necessity, become a drag on the performance of the units and a drain on the public exchequer too.

- For this purpose, a Single Holding Structure (SHS) for all new government-owned companies can be established.
 - The SHS can be in the form of holding company owning different stakes in different Government companies.
 - The management can be a mix of senior incumbent bureaucrats and members chosen for their integrity, expertise and domain knowledge in industry, economic or commerce.
 - The SHS can be self-managed like a mutual fund. The board of the SHS would appoint the board of the company it has invested into to the extent of its investment.
 - SHS would earn income through dividends from entities it invested into or through divestiture of its stake.
 - The performance of the SHS entity could be monitored by an empowered group of ministers to whom it would be accountable.

13.181. The above mentioned model can be used to fill gaps where there is not enough Indian presence in sectors and which the Government considers strategic and vital to India's future.

NATIONAL INVESTMENT AND MANUFACTURING ZONES (NIMZs)

13.182. NIMZ is a new concept which is an integral part of the recently approved National Manufacturing Policy of DIPP. The NMP is a policy solution for a number of challenges discussed in this document, and is a policy tool to be applied to select zones designated for promoting manufacturing.

Key Objectives

13.183. Creation of dedicated zones for manufacturing in the nation to

- Promote investments in manufacturing
- Make the country a hub for both domestic and international markets

- Promoting ease of development of manufacturing units

Concept and Approved Strategy

13.184. The National Investment and Manufacturing Zones (NIMZs) will be developed as integrated industrial townships with state-of-the art infrastructure and land use on the basis of zoning; clean and energy-efficient technology; necessary social infrastructure; skill development facilities, and so on to provide a productive environment to persons transitioning from the primary sector to the secondary and tertiary sectors. These NIMZs would be managed by SPVs which would ensure master planning of the zone; pre-clearances for setting up the industrial units to be located within the zone and undertake such other functions as specified in the various sections of this policy.

13.185. To enable the NIMZ to function as a self-governing and autonomous body, it will be declared by the State Government as an industrial township under Art 243 Q1(c) of the Constitution. In sum, the NIMZs would be large areas of developed land, with the requisite ecosystem for promoting world class manufacturing activity. They would be different from SEZs in terms of size, level of infrastructure planning, and governance structures related to regulatory procedures and exit policies.

13.186. The administrative structure of NIMZ will comprise of a Special Purpose Vehicle, a developer, State Government and the Central Government. The Central Government shall, by notification in the Official Gazette, notify an NIMZ. An SPV will be constituted to exercise the powers conferred on, and discharge the functions assigned to it under this Policy to manage the affairs of the NIMZ. Every SPV shall be a legal entity by the name of the NIMZ. This SPV can be a company, including a Section 25 company depending upon the MOU between stakeholders.

Role of Central Government

- Expenditure on master planning for the NIMZ.
- Improve/provide external physical infrastructure linkages to the NIMZs including—rail, road (national highways), ports, airports and telecom.

- Viability gap funding through existing schemes will be provided for internal infrastructure development in the zone including infrastructure for skill development.
- The Central Government, through its institutions and schemes, will provide institutional infrastructure for productivity, quality (testing facilities and so on) and design capabilities, encouraging innovation and skill development within the NIMZ.
- The Central Government will be responsible for the technology acquisition and development interventions in the policy.
- The Central Government will put in place a job-loss policy for units in the NIMZ.
- The Central Government will undertake, along with the State Government concerned, the promotion of domestic as well as global investments in NIMZs.

Role of State Governments

13.187. The State Governments would play the lead role in setting up of the NIMZs. In particular, the State Government would be responsible for providing/facilitating the following infrastructure:

- Land
- Power connectivity
- Provision of bulk requirements of water
- Road connectivity (State roads)
- Sewerage and effluent treatment linkages, from edge of NIMZ, to the final disposal sites
- Appropriate infrastructure to address the health, safety and environmental concerns

Institutional Framework for Implementing NIMZs

- The Department of Industry Policy and Promotion (DIPP) will be the nodal department of the Government of India for the NIMZs.
- Board of Approval constituted by DIPP will scrutinise applications for setting up the NIMZ, and subsequently monitor and expedite the progress of implementation.
- The administrative structure of NIMZ will comprise of a Special Purpose Vehicle, a developer, State Government and the Central Government.

- The SPV would be constituted for each NIMZ and will be responsible for its development and management. It will also be empowered to issue/expedite approvals and pre-approvals.

The Major Benefits for Units within NIMZ

- Job-loss policy will enable units to pay suitable worker compensation in the eventuality of business losses/closures through insurance and thereby eliminate the charge on the assets.
- The transfer of assets belonging to a firm which has been declared sick will be facilitated by the SPV of the concerned NIMZ.
- Exemption from capital gains tax.
- Skill up gradation programmes for new employees as well as for the existing employees in coordination with NSDC.
- Soft loans from multilateral institutions will be explored for funding infrastructure development.
- The developers of NIMZs will be allowed to raise ECBs for developing the internal infrastructure.

Special Incentives for Green Technologies in NIMZs

- Environmental audit will be mandatory
- Water audit will be mandatory
- Exemption from water cess
- Ten per cent one-time capital subsidy for units practicing zero water discharge
- Rainwater harvesting will be compulsory
- Under renewable energy appropriate incentives under existing schemes will be available
- Incentive to obtain green rating for buildings

Delhi–Mumbai Industrial Corridor Project

13.188. The DMIC is proposed to be developed on either side along the alignment of the 1,483 km long Western Dedicated Rail Freight Corridor between Dadri (UP) and JNPT (Navi Mumbai). Running across the six States of Uttar Pradesh, Haryana, Madhya Pradesh, Rajasthan, Gujarat and Maharashtra, the project seeks to create a strong economic base with a globally competitive environment and state-of-the-art infrastructure to activate local commerce, enhance investments and attain sustainable development.

13.189. Initially, seven investment nodes/cities have been taken up for development:

13.190. DMIC is conceived as a model industrial corridor comprising global manufacturing and commercial hubs, that is, self-contained, state-of-the-art, industrial cities. These cities will have world-class physical infrastructure like high speed road and rail connectivity for freight movement between the ports and production/consumption centres, logistics hubs, international air connectivity, reliable power and water, waste management and recycling.

13.191. With the view to taking the project forward to the implementation stage, the Cabinet in its meeting held on 15 September 2011 has approved the financial and institutional structure and financial assistance for the development of industrial cities in the DMIC. This inter alia includes creation of the ‘DMIC Project Implementation Fund’ of ₹17,500 crore over the next five years for the development of industrial. The Government of Japan has also announced their financial support for the DMIC project to an extent of US\$ 4.5 billion for projects with Japanese participation in the first phase of the project.

STRATEGIES FOR THE VARIOUS MANUFACTURING SECTORS

13.192. The objectives of the Plan will be met by the performance of enterprises in select sectors. The selection of the sectors that are included in the Plan has been on a ‘bottom-up–cum–top-down’ process. India’s New Manufacturing Plan is not made on a blank slate. Manufacturing enterprises are operating in the country in a large variety of sectors. They are competing with one another and with enterprises from abroad too. They understand the constraints in India on their competitiveness and growth, as well as opportunities before them. Therefore, associations of enterprises in various sectors were encouraged to prepare plans for their sector’s growth, along with the central Government ministry/department responsible for the sector. They have indicated what the enterprises (and their associations) will themselves be responsible for and the support required from Government.

Sector Coverage

13.193. Some sectors have been identified as critical in achieving the overall manufacturing goals. The key characteristics of these sectors are:

Sectors of Strategic Importance

13.194. It is essential for the country to develop domestic manufacturing capabilities in certain sectors for ensuring national security and self-reliance. Industries such as *Defence Equipment, Aerospace, Capital Goods, Electronics Systems Design and Manufacturing (ESDM) and Shipbuilding and Ship Repair* are sectors where greater focus is required to increase indigenisation in production.

Sectors for Basic Inputs

13.195. Availability of high-quality raw material and production inputs is essential for ensuring sustained growth of the manufacturing sector. Industries which are engaged in the production of *steel, cement, fertilisers*, and in the *exploration and development of Minerals*, underpin this growth. Significant impetus is required towards developing production capacities in these sectors.

Sectors for Depth and Value Addition

13.196. These are knowledge-intensive and technology-intensive industries with high growth potential. Developing competitive advantage in them through increasing depth and value addition in domestic manufacturing will contribute to long-term sustained economic growth. While India has developed good technological capability in certain sectors in this category (*automobiles, pharmaceuticals and petrochemicals*), it lags behind significantly in others (*electronics, chemicals and paper*).

Sectors for Employment Generation

13.197. Industries such as *textiles, food processing, leather goods, and gems and jewellery* are less capital intensive and more labour absorptive in nature. These are high employment generating industries that are currently dominated by MSMEs. They lack the deployment of sophisticated technologies in their manufacturing processes and instead rely heavily on manpower. Maximum growth in employment is likely to come from these industries and hence their

success is imperative for the country to achieve its job-creation goals.

13.198. The definition of the sectors was influenced by the way the ministries are organised. However, most of the growth and employment data available under NIC classification does not follow this sector definition. Therefore, we have attempted to correlate the Plans for the sectors (in the way we have defined in this Plan) to the industrial segments as per NIC classification to arrive at the likely scenarios for manufacturing growth rate and employment that will be achieved if the recommendations suggested in this Plan are implemented. The Table 13.8 provides the likely growth rate and employment figures that would be achieved on a 'business as is' basis with the manufacturing sector growing as per its historical growth rate (Scenario 1).

13.199. Under Scenario 2, we consider the manufacturing growth rate provided the manufacturing strategy is implemented. Targets for sectoral growth rates⁶ in manufacturing were derived by the respective working groups. This then provided the starting point towards identifying the supporting and enabling conditions that would need to be effected to realise the requisite outcomes. One such condition is that capital investment in the economy needs to be labour supplementing and not labour displacing; to reflect this we have deflated the growth rate of labour productivity in Scenario 2. As can be seen from the following table, in Scenario 2, the creation of 70 million additional jobs is a possibility, provided the manufacturing strategy recommendations are implemented, while a 'business as usual' approach will not create the requisite additional employment opportunities.

13.200. The Plan is a living process to shape and to strengthen the productivity and competitiveness of a large industrial ecosystem so that much faster growth of industrial output and more employment can be created across the country. Actions will be required in all States, and in many industrial sectors, to meet the ambitious national goals for the country's industrial sector that this Plan has laid out. This Plan cannot be 'the last word' on all that

TABLE 13.8
Manufacturing GDP by Sector and Employment Projections

Manufacturing Sectors (Excluding Mining)	Eleventh Plan*		Scenario 1: Manufacturing Growth as per Historical Growth Rates		Scenario 2: Growth rate as per Manufacturing Plan			
	Contribution to Manufacturing GDP	GDP CAGR 11th Plan	Employment 2009–10	Employment 2016–17	Employment 2024–25	GDP CAGR as per Manufacturing Plan	Employment 2016–17	Employment 2024–25
Food products and beverages	8.7%	7.3%	5.5	6.46	6.94	8.8%	7.29	9.50
Tobacco products	1.7%	4.7%	4.1	4.12	3.61	4.7%	4.35	4.17
Textiles	9.2%	3.8%	8.4	8.00	6.56	11.5%	12.07	19.14
Wearing apparel	3.9%	7.3%	7.3	8.57	9.20	11.5%	10.94	17.34
Leather products and others	1.3%	4.6%	0.9	0.90	0.79	24.0%	2.22	8.25
Wood and others	2.2%	12.0%	3.6	5.52	8.34	12.0%	5.82	9.57
Paper, publishing and others	2.7%	5.8%	1.6	1.72	1.64	8.7%	2.08	2.69
Coke, petroleum products, and nuclear fuel, rubber and plastics	10.6%	7.5%	0.8	0.95	1.03	10.7%	1.16	1.73
Chemicals and chemical products	12.2%	9.0%	1.7	2.20	2.66	12.0%	2.66	4.36
Other non-metallic mineral products	6.8%	13.6%	4.3	7.22	12.22	13.6%	7.61	14.03
Basic metals	9.7%	1.9%	1.4	1.19	0.84	10.3%	1.86	2.71
Machinery and equipment and others	11.1%	8.1%	3.8	4.68	5.33	16.8%	7.25	16.67
Electrical machinery and apparatus, telecom and others	6.0%	12.8%	1.3	2.09	3.34	12.8%	2.20	3.82
Motor vehicles and other transport equipment	7.7%	6.0%	1.5	1.63	1.59	13.0%	2.37	4.18
Furniture and other manufacturing	6.3%	6.3%	4.3	4.76	4.47	6.3%	5.02	5.43
Total			50.5	60.01	68.83		74.91	123.59

Note: *Contribution to Manufacturing GDP as per GDP Data series provided by CSO—2009–10. Basis of GDP CAGR Eleventh Plan estimates provided in the Annexure. Employment figures are in millions. Employment for 2009–10 does not include employment of 0.20 million for recycling and medical, precision and optical instruments, watches and clocks.

^ The key variables and assumptions are part of Annexure 13.1.

is required to be done. Just as many stakeholders, many sectors and many industry ministries have come together to start this comprehensive, collaborative process, others are expected to join too. Thus, the snowball will grow into a larger and faster movement. Indeed, the preparation of this Plan has already brought forth demands from sectors that did not join the first wave to come on board too. In the directions set by the Plan, they see opportunities for their growth too. For instance, biotechnology, which focuses on industrial enzymes, alternate energy, seed manufacturing, diagnostics, vaccines, discovery research and clinical services and biotech drugs, is emerging as an important focus area for the country.

13.201. While we have not included this as a separate section (this is included in the Drugs and Pharmaceuticals Section), the policies needed for the sector would be given due importance in the ongoing planning process. More such sectors are likely to join the planning process as we go along.

13.202. With this in mind, the process of planning has been designed as an ongoing activity with periodic reviews to ensure that right policies are provided to encourage new emerging industrial sectors and reviewing policies of existing sectors based on the changing global and domestic economic and industrial environment.

13.203. While there are certain common challenges and underlying solutions across sectors, which have been articulated in the previous section, each sector also has its unique constraints that need to be addressed. These sector-wise recommendations have been attached as an annexure to this document (Annexure 13.2).

STRATEGIES FOR HIGHEST IMPACT

13.204. The overall manufacturing strategy outlined in the chapter details many initiatives and actions that address the key challenges in each sector as well as focuses on capitalising on the opportunities that lie within. Also, recommendations have been formulated to relieve the cross-cutting constraints across sectors. A few high-impact strategies emerge, which

would serve well to further the overall growth of manufacturing in India (Box 13.3).

13.205. The Central and the State Governments are responsible for implementing the various policy-related and institution-related recommendations. This categorisation can be seen in Box 13.4.

WAY FORWARD

Principles of Policy Implementation

13.206. Research on success of countries that built effective implementation systems to create sustained competitive advantage across multiple manufacturing sectors provides some principles for a robust implementation process.

- *Build an implementation system, don't just do the task:* Explicit attention to the process of policy development and implementation has been lacking to a large extent in the Indian context. An effective implementation system is not limited to the success of a single initiative. It builds broad-based capabilities across several industries.
- *Systemic experimentation and learning help to progressively and rapidly improve implementation:* Even carefully designed programmes are likely to face challenges from unforeseen changes in the environment. Therefore, it is important to have learning and feedback mechanisms in place to ensure that implementation effectiveness improves through successive cycles. Good policy development (and implementation) should follow the PDCA cycle (Plan—develop strategy; Do—implement strategy; Check—diagnose issues in strategy and its implementation; Act—rectify issues identified).
- *Prioritise, sequence and create momentum through results:* Often it takes time for results of policy recommendations to become visible. When results are not visible, the implementation process may lose momentum. Therefore, to build momentum, some early wins must be targeted. They build confidence and commitment to the process.
- *Performance measures for government programmes have to be defined consultatively:* The old

Box 13.3 Strategies for Highest Overall Impact

Policy and Process Interventions

- Align stakeholders in the process of development and implementation of industrial policies.
- Simplify processes for doing business in India by mandating a 'Regulatory Impact Assessment' and operationalising single window clearance across the country.
- Create a level-playing field for Indian manufacturers through fiscal measures by correcting anomalies in duty structures.
- Boost demand for domestic manufacturing, regardless of ownership of enterprises, through public procurement backed by minimum threshold quality parameters.
- Bring down the cost of finance.

Technology Upgradation Measures

- Improve Government–industry and industry–academic collaboration.
- Encourage technology transfers through FDI/JVs.
- Improve technical standards and voluntary compliance, across the industry.
- Encourage adoption of 'green technology'.
- Modernise MSMEs through technology adoption and adequate access to finance.

Infrastructure Creation

- Improve transport and power infrastructure.
- Set up NIMZs (National Investment and Manufacturing Zones).
- Make industrial clusters more effective by creating both, the 'hard' physical infrastructure as well as the 'soft' infrastructure for knowledge creation and sharing.
- Design an effective land-acquisition process for industrial development.

Human Capital Formation

- Modernise labour regulations and institutions.
- Improve skill availability through Skill Councils.
- Ensure social protection to all employees in the manufacturing sector by creating 'safety institutions' for workers in transitory phase and develop innovative insurance systems for the informal sector.
- Improve 'industrial relations' through streamlining of consultative processes and representative institutions.
- Improve the quality of manufacturing managers/supervisors.

management adage—'you can't manage what you don't measure'—is especially true with regards to complex Government programmes. The need for performance measures is well accepted. However, it is also very important to define these measures appropriately. A key difference between public sector and private sector programmes is that the value required to be produced by public programmes is generally more intangible than in private programmes where shareholder value and profit may be good measures. Outcomes of public programmes must deliver against expectations of diverse public stakeholders.

Therefore, it is imperative that time is spent, upfront, to define outcomes in consultation with key stakeholders. Failure to do this causes the system to adopt simplistic measures of performance

against expenditure targets, which are not good indicators of the outcomes that were desired.

- *Coordination between Government departments is critical:* Given the complexity of policy issues relating to manufacturing, most solutions are likely to require coordinated actions between a number of Government departments. While the default solution is to create another agency/committee to oversee this coordination, this is not always the optimal solution. Before setting up such an agency/committee, the tasks required to be performed by such an agency/committee must be analysed and the existing system of agency/committees must be mapped to eliminate any overlaps and redundancies. Otherwise additional agencies/committees can increase the clutter in the system rather than

Box 13.4 Key Recommendations for Manufacturing

Category	Central Governments	State Governments
Policy recommendations	<ul style="list-style-type: none"> • Develop National Land Use policy • Reform the existing environmental clearance processes • Initiate Reforms in labour laws • Create a 'Sump' for transitory workers and 'job loss insurance • Mandate Regulatory Impact Assessment (RIA) for all regulatory changes in the country • Develop functional National Business facilitation and development policy • Develop functional competition Act • Evolve a Single Holding Structure for all PSEs • Create a National IP Mission • Develop Policy on technical regulations • Mandate minimum 30% local value addition for capital goods • Provide preference to local content in PSE purchases of capital goods • Rationalise the import of second hand capital goods • Make changes in ECB and FDI policy and removal of sectoral cap for banking sector (Steel) • Accord 'deemed exports' status to Steel Industry • Prepare policy on fuel usage in Transport sector • Evolve National Policy on Vehicle Retirement and End-of-life solution • Develop integrated chemical management policy and regime • Passing of MMDR bill 	<ul style="list-style-type: none"> • Reforming the existing environmental clearance processes • Developing State Land Use policy • Initiate reforms in labour laws • Developing State business facilitation and development policy • Developing State Competition Act • Mandate Regulatory Impact Assessment (RIA) for all regulatory changes in the State • Mandate minimum 30% local value addition for capital goods • Provide preference to local content in PSE purchases of capital goods • Improve the performance of power generating and distributing companies in the States • Streamlining the administration of sales tax, VAT and so on
Institution-related recommendations (new institutions)	<ul style="list-style-type: none"> • Create RBOs mandated and empowered for integrated Water Resource Management • Establish an independent and autonomous regulator for Land • Establish functional National-State Business Facilitation and Development Commissions • Establish functional national state institutions for promoting business responsibilities, competitiveness and competition reforms • Establish cluster stimulation cells • Establish speciality chemical forum • Constitute domestic council for leather industry • Create National Aeronautics Commission • Create National Discovery and Development Center for Pharma Industry • Develop institutional mechanisms enabling expert study of techno-economic policy issues relating to national raw materials security 	<ul style="list-style-type: none"> • Development of State maritime policies and boards • Strengthen land management at State level • Establish/strengthen State-level cluster stimulation cells
Strengthening of existing institutions	<ul style="list-style-type: none"> • Strengthen capabilities of <ul style="list-style-type: none"> – Local bodies for recycling and waste management – Standard developing organisations – Inspection bodies/certification agencies/regulators in the areas of Technical Standards – Scale up of operations of SME exchange 	<ul style="list-style-type: none"> • Strengthen capabilities of micro and small enterprises facilitation centers in States

improve its performance. Since coordination is an essential function to improve system performance, coordination/oversight should be accountable for performing its task and its performance must be measured too.

- *Stakeholder consultations are key to improve the quality of policy development and implementation:* Rather than seeking to a priori design a detailed plan in an unpredictable environment, it is better to create effective forums to identify problems, and for joint teams to be formed to tackle them. These forums should be broad-based and inclusive to ensure that all stakeholders can contribute to the process.

A Two Track Process of Implementation

13.207. The Manufacturing Plan makes many recommendations developed through a managed, participative process with structured involvement from a diverse set of stakeholders (Figure 13.7). Previous experiences of implementation in India have shown that the inability of various stakeholders to work together is a root cause of failure of policies.

13.208. The conventional response to this has been to try and create a structure with a chain of command. However, this becomes untenable when there are many stakeholders and owners who cannot all be included within such a structure. The recommended approach for policy implementation, based on the principles enunciated before, is characterised by three 'L's: enable *local* action, create *lateral* connections; and focus on *learning*. Local actions and lateral connections require a process of implementation that coordinates multiple entities in a consultative manner. Learning requires a process that systematically distils lessons from experience to improve the ongoing evolution of policies and their implementation.

13.209. Therefore, a two-track approach for implementation and learning is recommended: the first track delineates the steps required to convert the recommendations of the Plan to implementation and the second track concentrates on the systemic changes that need to be undertaken to strengthen the process of consultation, learning, policy making and ongoing implementation.

13.210. The 'third rail' that provides the power to accelerate learning and institutional capacity improvement is an ongoing process of evaluation and learning, which must be proactively facilitated through the creation of a 'backbone' organisation and other means. This approach is schematically represented in Figure 13.7.

Collaboration and Implementation

13.211. Two root causes identified for poor implementation are: inadequate consensus amongst stakeholders for policy changes and very poor coordination amongst agencies in execution.

13.212. Wide-spread consensus-building processes, therefore, need to be institutionalised within the Indian manufacturing system to ensure successful implementation of plans.

13.213. This consensus cannot be commanded. We need another mechanism specifically designed to bring people with different perspectives together: to listen to each other, to distil the essence of their shared aspiration for the country and the critical principles they will adhere to in the work they have to do together as partners in progress.

13.214. Hence, there is a need to establish an effective 'backbone' capability which will provide strength to multi-stakeholder policy and implementation processes.

13.215. The 'backbone' capability neither requires an organisation with large amounts of resources and manpower nor one with the power to command top-down. The 'backbone' capability must essentially comprise of small catalytic units located in many parts of the system, which can provide the 'tools and techniques' to the various States and ministries to effectively coordinate, design and implement their programmes. The backbone network (and its units) must rely on 'learning by doing' to enhance its own capacity and to transfer knowledge to other stakeholders tackling specific systemic issues.

13.216. The India Backbone Implementation Network will provide these institutions with tools

Implementation Tracks

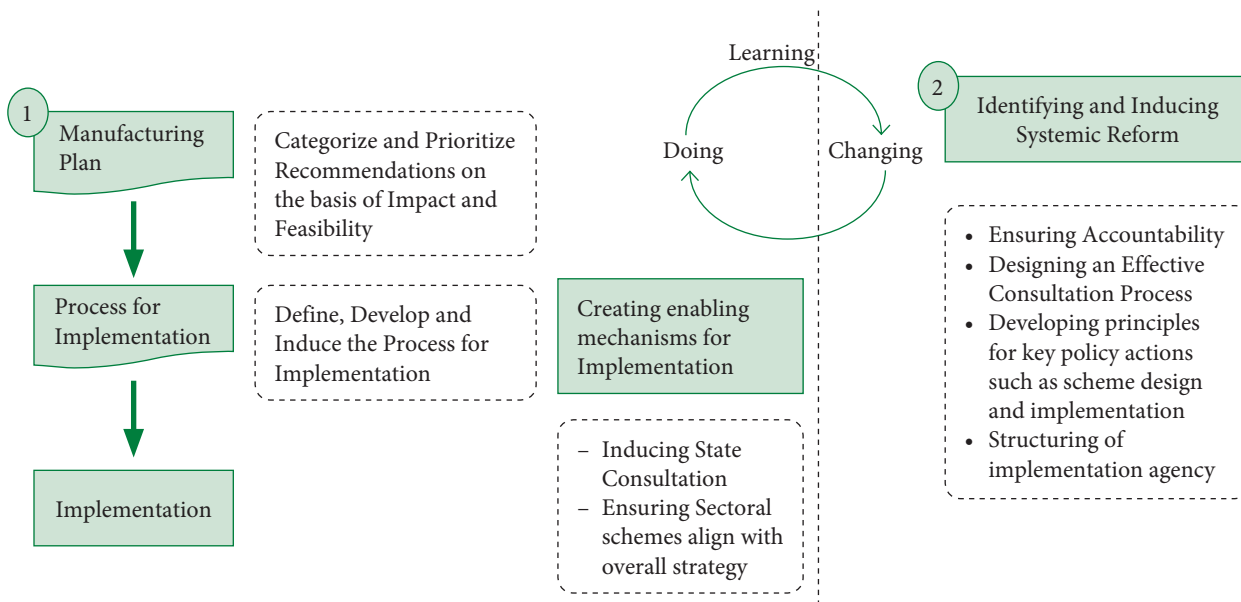


FIGURE 13.7: Two Connected ‘Tracks’ for Implementation and Systems’ Improvement

and assistance to fulfil their coordination functions more effectively. This has been discussed in detail in Volume I of the Plan document, in the section on Collaboration and Implementation, under the chapter on Governance.

A ‘Movement’ of Learning and Improvement

13.217. The distinction between creating yet another ‘organisation’ and stimulating a ‘movement’ is crucial. For widespread acquisition of capabilities, across a large, diverse, and democratic system, a movement of learning and change is required.

13.218. Japan was able to improve the quality of all its enterprises, in the public and private sectors, through the TQM movement. Relevant principles, techniques and tools were provided by many persons and organisations, notable amongst them were Professors Deming and Ishikawa, and Taichi Ohno of Toyota. These principles and tools were deployed by the movement. The subjects of the IBIN Movement are stakeholder collaboration and implementation. IBIN must play a catalytic role, and it must be designed for it. Strategic functions such as high-stake partnership brokering and project management are capabilities

that should rest within IBIN and can be managed with a compact team. Some amount of time will have to be invested in identifying staff and partners with the appropriate skills and character required for the work of IBIN and its units. Given that India has never quite had an organisation like the proposed IBIN, the enrolment process of partners will need to be very deliberate about selecting the right individuals and organisations for the job, keeping in mind how these selections will impact stakeholder perceptions of IBIN and, therefore, willingness to solicit services of IBIN and its units. Empanelment of partner organisations should be based on established guidelines/principles with a rigorous selection process whereby partners should expect to be challenged and evaluated, even being dropped from IBIN’s panels if deemed necessary.

13.219. Further to develop project management and stakeholder-alignment skills, IBIN needs the support of quality *policy analysis* to ensure consistency in implementation in the present federal structure (refer to Figure 13.8). Thus, IBIN could be well positioned to drive policy coherence at the central level and ensure nation-wide consistency in actions and

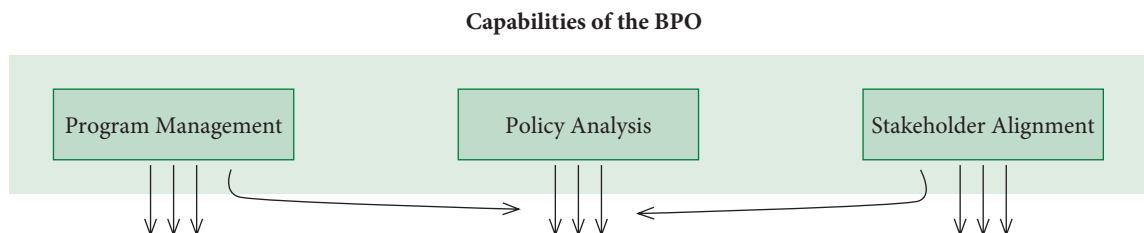


FIGURE 13.8: Capability Map

policies. For this IBIN's units at the Centre and in the States will use tools such as Business Regulatory Impact Analysis (BRIA) to analyse the need and relevance of existing as well as new regulations on the basis of set criteria, developed through a consultative process, and relevant to the Indian context.

13.220. As mentioned 'backbone' units should form at several nodal points in the institutional structures of governance in the country where coordination and management of implementation are key responsibilities. These will be in State Governments and they will be within national missions that bring together several agencies to produce integrated outcomes. In each of these, the three modules of capabilities described above may be required. Of these, stakeholder-alignment and programme management would be required invariably. The third capability, policy analysis, may be required in some units, not all. For example, it would be most likely required in State level units, but perhaps not in units supporting missions.

13.221. A decision will have to be made about where the central node of the 'backbone' capability (which as mentioned before must grow and be distributed across the country) will reside, taking into consideration how its location will impact stakeholder perceptions of its purpose, neutrality and capabilities, and therefore the willingness of stakeholders to solicit 'backbone' services or take part in IBIN interventions.

Make Systemic Reforms

13.222. In the course of developing the Plan for manufacturing, through intensive discussions with stakeholders, 'root causes' for present problems in

the country with implementation of such ambitious and complex programmes were located. Ways to address some of these have been built into the Way Forward for the Manufacturing Plan. However, some root causes require broader institutional changes. Efforts are being made by Government to address these. Implementation of those changes by Government will accelerate the implementation of the many actions required to achieve the country's ambitious goals for its manufacturing sector. These broader institutional changes, the benefits of which will be in all sectors of the economy, are described below.

Improve Architecture of Government Programmes and Schemes

13.223. Schemes, especially those that aim to provide financial incentives to encourage specific behaviours from the private sector, are popular instruments of manufacturing policy in the country. However, significant reforms are required in the architecture of schemes to ensure that they effectively and efficiently help to fulfil policy goals:

1. *Change the role of the central Government ministry from micro-manager to scheme designer and facilitator:* The ministry's role should be to act as a knowledge partner and enabler to the project implementers (which will typically be in the States). In order to be able to play this role effectively, the ministry will need to develop capabilities which are focused on scheme design and creation of learning systems and networks from which the States and other local implementers can learn.
2. *Establish strategic alignment of schemes:* Schemes should have strategic outcomes defined (such

as employment generation, number of patents, output generation and so on) so that measures of schemes' performance are not limited to expenditures against targets.

3. *Invest in good scheme design:* While the Planning Commission includes schemes in principle during the five-year plan process based on the strategic logic supporting them, the actual monies should be released only when the scheme design meets well-defined quality considerations. The ministry should be provided funds to design the scheme—which might require hiring consultants/experts or reaching out to numerous stakeholders—after which they should be provided funds for the schemes only if the design can demonstrate that the scheme will deliver on the desired outcomes.
4. *Establish an evaluation and feedback mechanism:* Schemes should be measured on productivity of the money being spent—this allows various schemes to be compared with each other. Also, the ministry should demonstrate how learning from implementing a scheme is being used in improving it.

Reform Government Institutions

13.224. The Second Administrative Reforms Commission has made several important recommendations that will improve the performance of Government generally and that will substantially improve Government effectiveness in growing the country's manufacturing sector. Since the recommendations are very well developed and explained in the ARC's reports, they will not be elaborated here; however, the following may be highlighted:

- In its Report No. 10, the ARC has recommended changes in the career structure of the administrative services that will ensure that senior postings have adequate tenure. It has also recommended an 'up or out' evaluation system so that only the better officers will stay in service and move to postings at the top. And it has provided for lateral entry from outside Government, of suitably qualified personnel for such top positions.
- In its Report No. 13, the ARC has recommended that policymaking functions of Government and

execution functions be separated and organised in appropriate structures. For 'execution' functions, the 'agency' structure has been strongly recommended. 'Agency' structures have enabled several countries—UK, Sweden, Japan, Australia and Thailand, to name a few—to substantially improve Government's performance.

13.225. The concept of 'agencification' is to carve out of Government departments, 'executive agencies' to carry out, under competitively selected professional managers on fixed tenures, specific executive functions within a framework of policy and resources. Each such agency is institutionalised in a framework document which spells out its mandate, mission and objectives, structure, accountability, standards and targets, financial arrangements and so on and is mandated to release an annual performance report and accounts. The agency has the freedom to mould its management style, strategy, operations, systems, workforce and so on within broad Government guidelines.

13.226. The advantage of the 'agency' structure is that it leads to clarity about outcomes. It also allows for an inculcated culture of service delivery, empowerment of frontline staff, greater accountability and openness, improved management, transparency and so on.

Role of Industry Associations

13.227. Industry associations have a vital role to play in the evolution and implementation of the Manufacturing Plan at the Centre and in the States. They provide platforms for their members to come together to analyse the constraints in the environment that must be addressed. Good-quality associations, that are democratic in their governance, transparent in their functioning and represent their industrial sector, or perhaps all industry, satisfactorily (that is, have large membership) can be invaluable partners of Government in the development and implementation of plans for manufacturing growth. Associations can also arrange platforms for consultations with Government and other stakeholders on the lines described above and thus can facilitate the

achievement of the country's goals for its manufacturing sector.

Involve Commercial Banks in the Analysis Process

13.228. Commercial banks, who provide finance to manufacturing enterprises, large as well as small ones, are a valuable (and neutral) source of insight into constraints of different sectors. They should be involved, more systematically, in the processes of evaluation of sectoral performance and for developing solutions, along with other stakeholders.

Disseminate Information to Public Effectively

13.229. Government must become much more effective in communicating with the public. Citizens are not aware of many schemes set up by Central and State Governments for their benefit. Stakeholders, who will be affected by new Government policies, realise only after the policies are announced, that they have great concerns whereas Government departments claim that the policies were posted on their websites and views had been invited. Moreover, with the ubiquity of electronic communications, including 24 × 7 TV news, and the advent of social media, Government's communication processes must be modernised, become more proactive, and reach out to citizens more effectively.

NEXT STEPS

13.230. The immediate next steps for implementing the Plan are:

- Take the Plan to the States: Much of the implementation of the Manufacturing Plan will be in the States. Therefore, State Governments and stakeholders in the States must be engaged.
- Put the implementation system in place: The implementation system described in this section will need to be instituted through the collaboration of various National and State agencies as well industry associations. The DIPP, NMCC and the Planning Commission will need to collaborate to delineate their roles in the implementation process.
- Ensure sectoral schemes align with overall strategy: The financial outlay of the Plan should be aligned with the strategies identified in the Plan. Rather than following the process where budgets are determined as variances to previous year's outlays, allocations should be designed and reviewed in accordance to the strategies identified.
- Communicate the Plan to a broader audience: Communication is critical to the successful implementation of any major change programme. Communications must be designed to suit the audiences for which they are intended. Some can be delivered in the form of documents or presentations. Others should be delivered through interactive discussions where clarifications can be given and even suggestions obtained. Industry associations can play a very important role in these. The Planning Commission, DIPP and NMCC would have to provide leadership and play a major role in the communications outreach.

ANNEXURE 13.1

Manufacturing GDP by Sector and Employment Projections

TABLE 13.9
Key Variables and Assumptions

Variable	Assumption(s)
GDP by Sector (Excluding Mining)	<p>National Accounts Statistics published by CSO provides GDP data series till 2009–10 for the manufacturing sector. This data was then extrapolated basis the projected growth rates in the economic survey report 2010–11 and adjusted for the slowdown in 2011–12 to estimate the overall growth rate for the Eleventh Plan. The growth rate thus arrived at, has then been used to project GDP for Scenario 1.</p> <p>For Scenario 2, growth rates as per sectoral working-group reports have been considered. It is important to note that NIC classification at the two digit level for capturing data related to individual sectors under manufacturing does not correspond to the classification of sub-sectors (eighteen) in the manufacturing strategy. Projected growth rates for the individual sectors as per the respective working groups have been mapped on a best information basis. The outcome of this approach is an average growth rate of 12 per cent for manufacturing sector as a whole during the Twelfth Five Year Plan and till 2025.</p>
GDP	GDP growth rate for the country is assumed to be at 9% for the model.
Employment by Sector (Excluding Mining)	<p>Employment data is quinquennial as published by NSSO. Employment data last available is for 2009–10. This has been used to calculate labour productivity, (GDP_t/Employment_t) for 2009–10 for each sector which is a key input variable towards projecting employment.</p> <p>Reflecting recent trends in productivity, the labour productivity growth rate has been assumed to be 6% p.a. under Scenario 1 and 5% p.a. under Scenario 2. Employment in manufacturing declined between 2004–05 and 2009–10 despite an increase in output. Hence, it is important to consider a long run view of the trend in labour productivity. As per Papola and Sahu (2012), labour productivity in India grew by 3.8% p.a. between 1993–94 and 2004–05 and by 6% between 1993–94 and 2009–10. It is important to note that in the unorganised segment which employs more than 80% of the workforce, manufacturing sector productivity per worker was estimated to be almost one-twentieth of that in the organised sector in 2006–07 (Papola et. al., 2011). Hence, a 6% growth rate has been an outcome of declining employment combined with a concentration of manufacturing output in the organised sector. This trend is not likely to be sustainable for the Indian economy, especially if the objective of inclusive growth needs to be realised. The manufacturing strategy for the Twelfth Five Year Plan aims to address systemic deficiencies in the economy with a clear focus on accelerating both growth and employment. Hence historical labour productivity growth rates cannot be relied on to project the likely impact of manufacturing strategy during the Twelfth Five Year Plan and beyond. The moderate adjustment in labor productivity growth rate from 6% in Scenario 1 to 5% Scenario 2 reflects the assumption that with increased focus on employment generation, capital investment will supplement labour rather than displace it (contrary to the trend that has been observed historically).</p>

ANNEXURE 13.2

Sector-wise Recommendations

1. As indicated earlier, we have included Plans for 17 different industrial sectors, under four categories—sectors of strategic importance, sectors of basic inputs, sectors of depth and value addition and sectors of employment generation. It is these sectors, which will have to achieve the Plan objectives, that is, growth and employment objectives. Following are the sector-wise recommendations.

(A) SECTORS OF STRATEGIC IMPORTANCE

DEFENCE EQUIPMENT

Introduction

2. India has been rapidly enhancing its spending on defence. It is expected that India would become the third largest defence spender after the US and China by 2014. Equipment spending by Ministry of Defence has increased by 15–20 per cent over the last five years. With several large equipment and modernisation programmes in the pipeline, analysts are projecting an overall spend of USD 80–100 billion in the next five years. This makes India one of the world's most lucrative markets for military products, and defence suppliers are gearing up to compete.

3. The Indian defence equipment market can be divided into four large areas:

- Land Systems
- Naval Systems
- Electronics Systems
- Aerospace

Key Objectives Under the Twelfth Plan

- Progressive increase share of domestic procurement from 30 to 75 per cent in next 10 years.
- Ensure that 8–10 largest weapons programmes in the country have a targeted large percentage of locally manufactured content.
- Build local IP in critical defence areas.
- Promote and track civilian applications of technologies and material developed during defence research.
- Support local defence manufacturers in building export capabilities.
- Enable creation of one million new direct and indirect jobs in the defence manufacturing space.
- Monitor implementation of Government's offset policy in letter and spirit for large contracts.

Strategy and Key Recommendations

- Set up a National Defence Manufacturing Council.
- Set up a national defence manufacturing council under the aegis of the Prime Minister's office to ensure that domestic manufacturing gets due focus.
- Pass an Executive Order with decision to use Make/Buy and Make (Indian) mandatory for flagship large programmes with appropriate funding to enforce Make or Buy and Make (Indian) classification for all flagship defence contracts and mandate that the prime contractor be an Indian entity, which can be a JV between a local entity and relevant global vendors.
- Decide the right financial model for Indian entities working with the Government on these flagship programmes.
- Streamline the defence procurement infrastructure
 - Need to streamline at the level of offset implementation, DPSU and OFB procurement and Ministry of Defence centered capital procurement.
 - Centralisation of procurement systems and infrastructure for DPSU and OFB, creation of a centralised list of defence vendors and providing guidance to new entrant in the system.
 - Provide standardised contractual frameworks and clauses that can be accessed by the multiple contracting agencies to reduce contract variation and complexity across the system.

- Adopt more professional and specialised approach to enhance the offset facilitation process.
- Increase the FDI limit for foreign participation
 - The current upper cap of 26 per cent on FDI in defence production needs to be relaxed to 49 per cent on case to case basis. Specific technology transfer should be specified and post-contract technology should reside in the JV/country.
- Support for SMEs
 - SME-specific support structure for upgradation of defence manufacturing facilities for deeper capability building, achieve manufacturing certifications like ISO, developing IPs and in establishment of licensed defence units.
- Create enabling infrastructure for capability building
 - Mechanisms to provide access to critical technologies available with research agencies or obtained through Transfer of Technology (TOT) arrangements.
 - Creation of a Centre of Excellence for Defence Electronics: to be modelled on a PPP model aimed at generation of indigenous IP.
- Vendor development
 - Continuous development of vendor base by DPSU.

AEROSPACE

Introduction

4. Aerospace manufacturing is a high-technology industry that produces 'aircraft, space vehicles, aircraft engines, propulsion units, and related parts.' Its value chain is characterised by a long project life cycle spanning R&D, engineering design, manufacturing, assembly, maintenance, repair and overhaul. India is one of the fastest growing aerospace markets.

5. The three segments of the Industry are:

- Defence
- Civil Aviation
- Space

Key Objectives Under the Twelfth Plan

- Develop greater design and manufacturing capabilities in the defence space.
- Become a global player in supplying advanced technology in space sector at a fair price in the global space market.
- Drive dedicated technology development for civil aviation, develop greater manufacturing capabilities.
- Become the international hub for maintenance, repair and overhaul needs.

Strategy and Key Recommendations

- *Strengthening institutional architecture* through a National Aeronautics Commission, if required
 - All the knowledge residing in entities like aeronautics organisations, colleges, labs and so on should be synergistically harnessed.
 - Map indigenous capabilities, identify knowledge gaps, direct resources efficiently to address critical technology gaps.
 - Formulate a national aeronautics policy to strengthen the aerospace industry.
- *Strengthening of certification organisations*
 - Given the expected increase in the work in the sector, CEMILAC and DGCA must be strengthened.
 - The government should facilitate certification of SMEs.
- *Promotion of PPP model*
 - PPP model by forming JVs should be encouraged in order to fully exploit the knowledge base of the government and the entrepreneurship of the private sector.
- *Earmarking special aerospace economic zones may be considered*
 - Creating clusters to certify and quality test aircraft and system components.
 - The growth in offsets could be efficiently utilised in the creation of such SEZs.

SHIP BUILDING AND SHIP REPAIR

Introduction

6. Nearly 95 per cent of India's foreign trade in terms of volume and more than 65 per cent in terms of value is through sea routes. Currently, about 10 per cent of our trade is carried by ships with an Indian flag while the ships manufactured in India carry even less cargo. India's emergence as a major economic power would mean greater integration in terms of trade with the rest of the world, requiring huge shipping tonnage. To ensure the safety of our vast coast line, the naval requirement of sophisticated and modern vessels is also growing rapidly. Therefore, shipbuilding is very important from a civilian as well as defence perspective.

7. While the Indian seaborne trade has been growing rapidly, Indian shipping and shipbuilding sector has been lagging behind despite their development potential. Indian registered ships form just about 1.1 per cent of the global shipping stock. Indian EXIM trade is being increasingly serviced by foreign flagged vessels whose share in the Indian shipping market has increased from 60 per cent in 1980s to about 92 per cent by 2009–2010. This is both a cause of concern and a huge opportunity for India's shipping and shipbuilding sector.

Key Objectives Under the Twelfth Plan

- Medium and long term goals have been set for the Indian shipbuilding and ship repair industry. These are:
- To achieve 5 per cent share of the global shipbuilding market and 10 per cent share in the global ship repair industry by 2020.
- To be self-sufficient in ship repair requirements of the country and to emerge as a dominant ship repair centre displacing Colombo, Dubai, Singapore and Bahrain.
- To develop a strong ancillary base for shipbuilding/ship repair in the country by 2020.
- To generate additional employment for 2.5 million persons (0.5 million direct and 2.0 million indirect) by 2020 in the core shipbuilding as well as the ancillary and supporting industry sector.
- To develop strong R&D facilities and design capabilities for commercial shipbuilding.

Strategy and Key Recommendations

8. The key recommendations to enable the shipbuilding and ship repair sector to meet its mid-term and long-term goals are:
1. Incentives: In the line of the erstwhile Shipbuilding Subsidy Scheme, some form of adequate financial/fiscal incentive would need to be considered in order to facilitate the industries to achieve critical mass.
 2. Infrastructure status to shipbuilding: Granting infrastructure status would enable the indigenous shipbuilding industry to enjoy tax benefits and lower interest rates for investment in the technological development and modernisation.
 3. Purchase preference for Indian built, Indian flagged vessels and Indian shipyards in Government/Defence purchase: On the lines of global practice, promotion of the use of locally build vessels by local shipping companies would help To develop domestic shipbuilding capabilities.
 4. Offset scheme for Government procurement: In order to provide impetus to the ancillary industry in India, it should be mandated that during the purchase of any ship from a foreign yard, the foreign yard would have to source a certain amount of marine engineering goods from India. This can create a steady stream of orders for domestic marine engineering companies and help develop capabilities in the sector.
 5. To examine the issue of incidence of taxes that disadvantages the domestic shipbuilding industry.

CAPITAL GOODS AND ENGINEERING

Introduction

9. The Prime Minister's Group constituted under Chairman, National Manufacturing Competitiveness Council in its Report (Prime Minister's Group Report—PMGR) identified capital goods as one of the sectors that is strategic for strengthening national capabilities for the long term. The PMGR has recommended support for the following sub-sectors within the capital goods sector: (i) machine tools, (ii) heavy electrical equipment's, (iii) heavy transport, earth moving and mining equipment's, and (iv) high technology equipment's like IT, telecommunications and electronics hardware. The PMGR has recommended that a time-bound action plan should be prepared in each of these areas for building high class modern capacities with R&D facilities, appropriate programme to encourage growth and development of these areas in the private sector together with

strengthening of the existing public sector and revisiting the existing policies to protect and promote selected capital goods industries.

10. PMGR has also recommended enunciation of a clear policy to provide incentives for acquisition of advanced technologies strengthening the country's technological capabilities in the long term. Need for a dedicated fund for acquiring technology for tier-2 suppliers of priority sectors and an 'offset policy' as one of the means to boost domestic content in the total equipment imported has been underlined. A review of the current FDI policy from the point of view of transfer of technology as well as considerations of national security was also recommended. This can be done by giving preference to JVs instead of 100 per cent foreign-owned companies.

Key Objectives

11. The Plan focuses on the following sectors: machine tools, earth moving, heavy electrical, metallurgical, textile, process plant, mining, power plant and other industrial machinery and engineering sectors. The key objectives were to make the capital goods sector globally competitive, reduce overseas dependence in strategic sectors, increase depth in manufacturing and enhance production levels, employment, exports and contribution to the national exchequer.

Strategy and Key Recommendations

- I. *Investment inducement through clusters*: Apart from common facilities for product development, design and testing, clusters should include enterprise management development through a common training centre promoted through SPVs.
- II. *Skill development support*: Problem of skill deficit impacting the machine tools, electrical machinery and earth moving equipment segments should be remedied through a two-pronged approach comprising skill development through public agencies as well as with the help of private sector on a Public-Private Partnership mode.
The action steps suggested in the different sub-sectors of capital goods include upgradation of selected ITIs, polytechnic institutions and engineering colleges and to establish centre of excellence for executive development.
- III. *Fund for Expansion/Modernisation of existing units; fund for technology transfer, acquisition of firms abroad*: The industry is considered high risk and not considered a preferred borrower. Therefore, low-cost funds are required to stimulate creation of additional capacity and for technology upgradation.

The following major *recommendations for policy initiatives* are proposed for the capital goods and engineering sector:

- Support for incentivising technology development/transfer and value addition in India
 - Modify FDI policy to ensure transfer of technology by giving preference to JVs instead of 100 per cent foreign-owned companies
 - Develop indigenous facilities for design, development and testing of equipment
 - Incentivise/mandate foreign players to increase value addition in India
 - Preference in PSE/Government purchases for products having higher local content
- Substitute Imports: Calibration of duties and taxes to remove disadvantages for domestic players
 - Regulate/ban import of second-hand machinery
 - Address adverse tax structure for local manufacturers in India
 - Modify Government tender terms to remove disadvantages to Indian firms against imports
- Promote exports by facilitating dedicated line of credit and brand development

12. Though many of the issues constraining the growth of the capital goods sector are common, there are specific sub-sector issues that would require to be addressed with specific measures. The issues specific to machine tool, heavy electrical and power plant equipment, earth moving and mining equipment and associated recommendations are as follows:

Machine Tools Industry

13. India's share of machine tool production is at present only 0.8 per cent of world production. At present, about 70 per cent of the requirement of machine tools is met through imports. There are 8–10 large companies (turnover above ₹100 crores), 10–15 medium companies (50–100 crores) and rest are small. HEC and HMT are two CPSEs in the machine tools sector. New investments have been few, due to low returns on investments. However, the machine tool industry has the potential to grow from about 12 per cent per annum to 15–20 per cent. To achieve a market share of about 50 per cent by 2020, the industry will require a set of policy, investment and technology development measures.

14. The recommended measures, in addition to policy support, include Government support for capacity expansion. The measures include support for technology transfer, common facilities, R&D/incubation centres, business and market development and cluster parks. Some of the major recommendations are as follows:

1. Define a National Mission for Machine Tools
2. Introduce immediate fiscal incentives
3. Mission to indigenise critical mechanical elements and machine tool electronics
4. Measures to attract investment are a priority
5. Creation of modern state of the art capacities
6. Realise full potential of PSU capacities—currently, capacity in PSUs such as HMT and HEC not optimally utilised
7. Fillip to R&D and technology development is essential
8. Industry–academia–R&D linkages

Heavy Electrical and Power Plant Equipment

15. Heavy electrical and power plant equipment sector is growing at about 14 per cent. Its growth in two distinct segments, that is, power plant equipment and electrical equipment for power transmission and distribution are being driven by the major power addition programmes namely, Restructured Accelerated Power Development and Reforms Programme (R-APDRP) and Rajiv Gandhi Vidyutikaran Yojana (RGGVY) and transmission projects.

16. With increase in the requirements for meeting the planned additions and a shift towards setting up higher efficiency super critical power plants in the country, the Indian domestic manufacturers have formed joint ventures (JVs) with foreign companies and are focusing on manufacturing higher efficiency equipment's. The domestic industry has expressed concern about contract with Chinese suppliers and the lack of capacity utilisation in BTG segment. The 'Electrical Equipment Manufacturing Industry'—Industry Report 2010 by IEEMA has highlighted concerns of limited high-voltage testing facilities, varied procurement guidelines of state utilities, persisting gap between Indian and international standards. Threat of rising imports issues of inverted duty structure, critical raw material constraints and absence of appropriate clause to allow preference in domestic procurement on the lines of procurement guidelines of World Bank and ADB. Following are the sector-specific policy recommendations:

1. Ensuring utilisation of domestic capacity
 - a. Ensuring sufficient investment in power generation through appropriate Government policies to create adequate demand potential for heavy electrical and power plant equipment
 - b. Creation of appropriate conditions enabling full capacity utilisation of domestic manufacturers of heavy electrical and power plant equipment
 - c. Constituting a special vehicle for State Electricity Boards (SEB) facilitating replacement of old and ageing power plants
 - d. Facilitating availability of critical raw materials
2. Standardisation: Adoption of uniform ratings by Central Electricity Authority (CEA)/Ministry of Power (MoP) as standard ratings to be adopted for the Indian grid.
3. Testing facilities: Strengthening of R&D Infrastructure at national level for type testing of prototypes with a view to minimise development/commercialisation cycle.

Earth Moving and Mining Equipment Sector

17. The earth moving and mining equipment as well as the construction equipment industry (CEI) in India enjoys a positive long-term outlook. Planned investment in infrastructure (more than US\$1 trillion) and growing urbanisation will drive the construction industry to grow at 16–17 per cent CAGR over the next 10 years. The growth opportunities are accompanied by increasing competition from equipment's from countries like Brazil and China.

18. The sector has evolved over the years and is at present in an intermediate stage of development. Some products manufactured in India by some of the MNC's who have set up assembly plants in India are meeting the global standards. It is estimated that the domestic content is nearly 35 per cent in standard equipment whereas the domestic content is about 78 per cent in high technology equipment's. Over the years three Chinese companies have emerged as leading construction equipment

manufacturers and have cornered a 12 per cent share of the market. Competition is likely to intensify as many Chinese players have improved their distribution and after-sale networks in India.

19. Like its global counterpart, the domestic mining sector is now graduating into high-end technology products and is in demand of transfer of such technology. A recent Industry Report by CII on the Indian Construction Equipment Industry emphasises for (i) rationalisation of taxes to mitigate impediments for interstate movement of earth moving and construction equipment, (ii) bridging skill gaps, (iii) prohibiting unregulated import of used equipment, and (iv) removal of ambiguity about emission and safety standards.

Following are the major recommendations:

- Emission standards must be made applicable to earthmoving equipment's and so on.
- Initiatives for indigenous development of certain equipments like dredgers are to be taken to achieve self-reliance in this area
- The existing competence and capability of Bharat Earth Movers Ltd (BEML) need to be, inter alia, strengthened by providing support for transfer of technology

ELECTRONICS SYSTEMS DESIGN AND MANUFACTURING

Introduction

20. Electronics Systems Design and Manufacturing (ESDM) comprises semiconductor design; high-tech manufacturing; electronics components; electronics systems design telecom products and equipment's; IT systems and hardware and other segments. Electronics, along with Information and Communications Technology (ICT), is considered a meta-resource: the competitiveness of various industries often depends on their ability to integrate ICTE in their business processes. Electronics is the largest and the fastest growing manufacturing industry in the world. It is expected to reach US\$ 2.4 trillion by 2020.

Key Objectives Under the Twelfth Plan

The key objectives for the ESDM Sector are:

- To achieve domestic production of USD 122 Billion by 2017 (growth of 30 per cent)
- To ramp up domestic value addition in ESDM manufacturing

Strategy and Key Recommendations

The strategies and key recommendations are:

Creating a level playing field

- Introduce Modified Special Incentive Package Scheme for improved value-addition
- Provide preferential market access to domestic industry in the ESDM sector and remove trade barriers through effective negotiations in WTO
- Mandate Indian standards for ESDM to safeguard against substandard items
- Introduce reforms in Government procurement procedure for electronics hardware

Creating an enabling environment

- Set up a national electronics mission
- Promote exports of ESDM by providing appropriate incentives and brand development
- Promote sustainable growth through waste management practices

Providing support across the value chain

- Set up semiconductor fabs in India and encourage innovation, R&D and Indian IP by setting up of Electronics Development Fund
- Promote the semiconductor chip design, electronics components and strategic electronics industry

STEEL

Introduction

21. Indian iron and steel industry, with its strong forward and backward linkages contributes significantly to the overall growth and development of the economy. The industry today directly contributes 2 per cent to India's Gross Domestic Product and its weightage in the official Index of Industrial Production is 6.2 per cent. India has become the world's fourth largest producer of crude steel, preceded only by China, Japan and USA. However, India has been lagging behind other major steel producing countries in terms of techno-economic efficiency of operations and hence Indian steel industries are not very globally competitive.

22. There is an urgent need to address its basic constraints irrespective of equity size and nature of operations. In 2010, our per capita consumption of steel was only 51.7 kg, as against the world average of 202.70 kg. There is tremendous potential for improvement in the domestic steel consumption given the economy's large untapped markets, especially in rural areas. With a GDP growth of ~9 per cent, the sector is expected to grow by ~10.3 per cent in terms of steel consumption. This translates to a need an installed capacity addition of 142.3 MT of steel in the Twelfth Plan.

Key Objectives Under the Twelfth Plan

- Increase capacities to ~142.3 MT in accordance with demand projections
- Ensure raw material security, especially in terms of iron ore and coking/non-coking coal

Strategy and Key Recommendations

Raw Materials

23. Iron ore is the basic raw material used in steel making. Though iron ore is abundantly available in the country, large scale exports of iron ore have raised serious concerns about the future availability. Side by side, there is an urgent need to address the problems of degradation of the environment, displaced population, transportation bottleneck and so on.

24. The domestic availability of coking coal, a critical raw material required by steel industry is limited and therefore the Indian steel industry has to depend heavily on imported coking coal to meet its needs. To ensure raw material security and minimise the impact of volatility in coal prices, it is desirable to acquire overseas coking coal assets and to increase the domestic production of coking coal and upgrade its quality.

Infrastructure

25. Given the rising demand anticipated in the Twelfth Plan period, the already overburdened domestic infrastructure and more particularly in mineral rich states requires immediate attention. Apart from ensuring adequate rail-road connectivity, National Investment and Manufacturing Zones (NIMZs) proposed in the National Manufacturing Policy may provide an excellent option for future location for new steel plants due to close proximity to consumers. However, for this to happen, the perspective planning for NIMZs has to consider some of the NIMZs in the eastern region of mineral-rich states.

Financial Resources

26. The requirement of financial resources to create an additional capacity during the Twelfth Plan at reasonable costs will be a challenging task. Softening of norms for external borrowings and having a special purpose long-term financing facility may ease the situation.

Technology and Research and Development

27. Indian Steel Plants are less efficient in terms of specific consumption of raw material/consumables, energy/power consumption, environmental and pollution norms than those in advanced countries. It is essential to build up indigenous capacity to develop technologies to suit indigenous raw materials, improve energy inputs norms and meet national emission and comply with global standards on emissions and carbon foot print and so on. Several small units engaged in manufacturing iron and steel products need to focus on domestic R&D to improve their technology and performance standards.

28. Improvement in raw materials is to be achieved through selection of appropriate beneficiation process and improvement in operational practices of ore beneficiation/coal-washing circuit. Coal gasification of non-coking coals and recovery and

utilisation of CBM, are the important steps to address the issues such as coal coke shortage and CO₂ emission. To alleviate the shortages of iron, there is a need to put up pellet plants. Due to increasing demand for high-strength steel, current Batch Annealing Furnace (BAF) technology may get replaced with Continuous Annealing Technology.

29. The strategies for development of steel sector should not only focus on volume growth but also on quality of growth. It is necessary to evolve an approximate sustainable development framework which balances the need for rapid growth of the steel industry and also addresses the concerns on environment and climate change. There is a consensus that there exists a lot of scope for the Indian steel industry to contribute to the National Mission on Enhanced Energy Efficiency (NMEEE) as well as National Action Plan on Climate Change (NAPCC) of 2008, which basically aims to reduce the emission intensity. Existing plants need to evolve short-term and long-term action plan to phase out the old and obsolete facilities by State-of-art, clean and green technologies with an aim not only to achieve higher standards of productivity but also to harness all waste energy.

30. The Steel Industry needs policy support from the States to achieve the object of the National Steel Policy to make India a global producer.

Plan Assistance/Allocation for the Steel Industry

31. The Twelfth Plan's new projects essentially focus promotion of beneficiation and agglomeration of low grade iron ore and iron-ore fines and improvement of energy efficiency in secondary steel sector.

MINERAL EXPLORATION AND DEVELOPMENT

Introduction

32. India is endowed with ample resources of a number of minerals and has the geological environment for many others. The metals and minerals sector has a direct bearing on the growth, development, depth and sustainability of the manufacturing and infrastructure sectors. Hence, its extraction and management have to be integrated into the overall strategy for the country's development. Raw material security and the ability to provide the range of metal-based mineral required in terms of quality, standards and prices are keys to the process.

Key Objectives Under the Twelfth Plan

33. The mining sector is strategically very important for India. The key goals that need to be met for this space are:

- Raw material security: for all the user industries
- Enhanced co-production of by-product metals for Technology Metals and Energy Critical Metals and Rare Earths Elements
- Ensuring sustainability of the environment

Strategy and Key Recommendations

34. The core function of the state in mining needs to be the facilitation and regulation of exploration and mining activities of investors and entrepreneurs, provision of infrastructure and royalty and tax collection. In order for the State to achieve the key objectives associated with the sector, a select set of reforms are essential. The major recommendations are as under.

Strengthening of Institutions

- Equip and position public agencies like the Mineral Exploration Corporation Limited, Atomic Minerals Directorate for Exploration and Research, Indian Rare Earths Limited, Directorates of States and other organisations to conduct detailed exploration at the State's expense to enable the State Government to adopt a bidding route for exploration to a larger extent.
- Position GSI to emphasise on geospatial and multi-disciplinary work for the benefit of science, society and the nation, by placing emphasis. An overarching mechanism to provide policy direction for geosciences is a must.

Encouraging R&D and Technology Development

- Engage IBM to drive process of giving special focus in select areas of mining.
- Strengthen the Mineral Process Laboratories of IBM and other research organisations must before the development of processes for beneficiation, elemental analysis of ores and so on.
- Inspire concessionaires to undertake deposit-specific process R&D.

35. Develop an institutional mechanism for the direct lab scale research to commercialisation for the production of materials of high purity,

- Reorient focus of organisations like Non-Ferrous Technology Development Centre, Jawaharlal Nehru Aluminium Research Development and Design Centre on process R&D for Technology and Energy Critical Metals.

Creation of Infrastructure

- Special emphasis needs to be given to linking infrastructure in mineral bearing areas.

Skill Development

- Review and upgrade existing training facilities for manpower to meet the requirements of the mining industry.

Ensuring Full and Productive Coverage of Survey and Exploration

- GSI needs to ensure that its regional surveys cover all major geo-scientific datasets
 - All pre-competitive data must be available to facilitate entrepreneurs to take investment decisions.
- India's Exclusive Economic Zone (EEZ) needs to be fully explored and exploited. This requires sea-bed exploration and mining, and the Ministry of Earth Sciences and GSI need to cooperate at an institutionalised level to expedite and complete this task.
- There is need to address all important aspects of Rare Earths including Mapping the potential sources, enhancing survey and exploration indigenously as well as in joint collaboration overseas, scaling up R&D in extraction, re-cycling and research for increase use in other alternative materials in place of Rare Earths.

A Database of Mineral Resources Needs to be Developed

- Consider an efficient IT system in GSI, IBM and State Directorates to ensure availability of a comprehensive and up-to-date review of exploration data.
- For this purpose, create a National Geophysical Data Repository and a National Drill Core Library.
- Implement the National Tenement Registry and integrated it with the cadastral maps being digitised under the National Land Records Computerisation Scheme.

Ensuring Availability of Financial Resources

- Access to "risk funds" from capital markets and venture funds needs to be facilitated since prospecting is a high risk venture.
- A suitable scheme for taking full advantage of the HTREL licence must be completed in consultation with the major financial institutions in India, including SEBI, RBI, CBDT and IVCA.

Ensuring Environmental Sustainability of Mining

- Promote a scientific and efficient process of small scale mining of small deposits
 - Regulations related to safeguarding the ecology must be ensured and their compliance strengthened.
 - A cluster approach must be adopted with a single lease model for multiple small deposits within a defined area
- Undertake all mining undertaken within the parameters of a comprehensive Sustainable Development Framework
 - Under such a framework, no mining lease should be granted without a proper mining plan including an approved environment management plan.
 - For this purpose, the IBM must acquire the expertise to approve Environment Management Plans and conduct Environmental Impact Assessments. Thus, the IBM should be able to position itself as the internal environmental regulator as well as the official mining regulator for the sector.

Select Policy Changes in Line with the Overall Strategy

- Adopt an open-sky policy of non-exclusivity for reconnaissance work
- Introduce a new instrument called the High Technology Reconnaissance and Exploration License (HTREL) to attract large investment and better technology
- Ensure higher value addition in the sector and curb non value-added exports
 - Encourage mineral value addition through techniques of beneficiation, pelletisation, agglomeration and processing making use of fine.
 - Incentivise export of minerals in value added form and develop a coherent long-term strategy for this

- In line with this, forge long-term relationships with countries with complementary resources, in terms of minerals and technologies.
 - Encourage the user industries to develop long-term linkages with mineral producing units.
 - A fair and transparent process for land acquisition must be ensured. This is already under way through the LARR bill
36. The MMDR bill aims at enabling some of these key recommendations, and must be pushed for implementation at the earliest.

FERTILISER

Introduction

37. The Indian fertiliser industry, given its strategic importance in ensuring the food security in the country has remained under Government control. Through its impact on agricultural productivity, fertiliser usage directly impacts food security of the country. Government has been consistently pursuing policies conducive to availability of adequate quantity of quality fertilisers throughout the country and their appropriate use. The annual consumption of nutrients (N + P + K), has increased by 62 per cent, from 17.4 million tonne in 2001–02 to 28.1 million tonne in 2010–11. The nutrients N, P and K accounted for 16.6, 8.0 and 3.5 million tonne respectively in 2010–11.

38. In recent years, there has been a significant increase in imports of urea and DAP because there has been hardly any investment for major capacity additions. Fertiliser consumption in India is highly skewed, with wide inter-regional, interstate, inter-district and inter-crop variations. The average intensity of fertiliser use in India is much lower than most countries in the world.

39. Government introduced Nutrient Based Subsidy (NBS) for Phosphatic and Potassic (P and K) fertilisers with effect from 1 April 2010 with broad objectives of ensuring balance use of nutrients, introduction, and promotion of innovative and efficient fertiliser products and allowing market dynamics in pricing of products.

Key Objectives Under the Twelfth Plan

40. The key objective for the fertiliser sector is to ensure national food security by generating sustainable rapid growth in fertiliser use to increase agricultural production and productivity at the desired rate. In order to meet the growth targets in fertiliser use, the following measures are needed:

- Ensuring adequate and timely availability of quality fertilisers to the farmers at fair prices
- Creating an attractive environment for improving indigenous fertiliser
- Rationalisation of the level of fertiliser subsidy disbursed

Strategy and Key Recommendations

Improving Fertiliser Use

41. For continuous rapid growth in fertiliser use to increase agricultural production and productivity, the Fertilisers Monitoring System (FMS) should be strengthened. There is a need to produce and promote right kind of efficient fertilisers like customised, water-soluble and fortified fertilisers.

Attracting Investment in the Sector

42. With rising demand and no major domestic capacity addition during the last few years, the industry has been exposed to volatility of world markets. There is an urgent need to create a conducive environment for new investments in the sector. Investment for revival of closed units of Fertiliser Corporation of India Ltd (FCIL) and Hindustan Fertiliser Corporation Ltd (HFCL) will significantly bridge the demand–supply gap of urea.

Availability of Feedstock

43. The Government needs to ensure long-term supply of natural gas at reasonable prices with pipeline connectivity to attract fresh investment in urea sector. For this, part of future gas finds need to be committed for the new investment in urea units and incentivising alternative feedstock like coal, CBM and so on to enlarge the choice of raw materials. There is a need to explore the possibility of investment in R&D for extracting potash from other resources in the country.

Rationalising Subsidy

44. The burden of fertiliser subsidy has increased substantially during the last few years mainly owing to increase in international prices of inputs as well as finished fertilisers. A phased approach towards reforming the subsidy disbursement mechanism needs to be developed as under:

- Phase 1: Create information visibility of the movement of fertilisers along the supply chain
- Phase 2: Release subsidy to the retailer through transfer of subsidy directly to the retailer's bank account on receipt of fertiliser from the wholesaler
- Phase 3: In the long run once Aadhaar enabled payments are operational, subsidy disbursement to the farmer can be made directly into the bank accounts of the intended beneficiary

Joint Ventures Abroad

45. Rising imports of fertilisers are a cause of concern and require urgent attention. India, being one of the largest consumer of fertilisers in the world, has significant impact in world trade and prices and is exposed to high volatility in prices. There is a need to ensure long-term supplies of raw materials/intermediates to fertiliser sector by promoting investment and setting up JVs in mining capacities of the countries with rich reserves of natural gas, rock phosphate and potash with appropriate buy-back arrangement or long term off-take arrangements.

Setting up R&D Centre

46. R&D centres need to be encouraged especially in the area of catalyst efficiency, retrieval of elements from spent catalyst, new fertiliser development, improving fertiliser use efficiency and so on.

Fertiliser Prices Regulatory Authority

47. With the implementation of Nutrient Based Subsidy (NBS) regime in non-urea sector and likelihood of extension to urea sector, the fertiliser sector moved towards a free market system. Therefore, it may be necessary to consider a fertiliser prices regulatory authority to oversee and regulate fertiliser prices in the interest of the agriculture sector.

Road Map for Sick CPSUs

48. Despite the overall health being fairly satisfactory. Three of the central CPSUs, three units BVFCL, MFL and FACT are incurring losses due to outdated technology and, high energy consumption. There is a need to explore various possibilities for their revival and sustainable operation to come up with a holistic revival plan for the sick CPSUs.

CEMENT**Introduction****Key Features of Cement Industry**

- Cement production is one of the world's most energy-intensive industries. Cement industry is in a way a scavenging industry and has been burning alternative fuels such as, residue derived fuel, municipal sewage wastes, agro wastes, plastic and polythene wastes, paint sludge, shredded tyres and so on in the kiln and conserves fossil fuels.
- Because of low-value high-density product, cement movement is normally restricted to nearby markets and has very limited international trade.
- Initial investment of setting up a plant is very high.

Production Trends

49. Global cement production has continued to be expanding at an average rate of 6.4 per cent in last five years from 2,568 million tonnes in 2006 to 3,294 million tonnes in 2010. Around 56 per cent of production originates in China. China (with an average annual growth of 11.4 per cent) and India (with an average annual growth of 9.8 per cent) have been the drivers of the growth in global cement output, with increase in production in rest of countries remaining virtually stable. Production of cement in India has increased from 100.1 million tonnes in 2000–01 to 228.3 million tonnes in 2010–11. The demand for the cement in India has been influenced mainly by the housing, infrastructure and irrigation and so on.

Key Objectives Under the Twelfth Plan

- Reducing environmental impact of industry and encouraging use of fly ash
- Modernisation of plants based on older technology and further improvement of plants

Strategy and Key Recommendations

Measures to Maintain Existing Capabilities

- Allocation of coal of better quality and consistency to cement plants and also speeding up privatisation of collieries for captive consumption of cement plants should be considered
- To ensure availability of limestone process of limestone mining lease approval/renewal need to be streamlined and simplified as well as encourage mining of limestone at remote areas
- Rationalising duty structure
 - Simplification of excise duty to have specific rate or percentage of sale price with appropriate abatements
 - Rationalisation of inverted duty structure to address any inversions

Reducing Environmental Impact of the Industry

- Incentivise non-polluting cement plants adopting newer technologies
- Grant cogeneration of power through waste heat recovery status of renewable energy
- Cement plants should be permitted to move waste from other states with minimum restrictions if they are following standing guidelines
 - Encouraging use of fly ash by ensuring availability of comprehensive data on fly ash generation, disposal, stock and its pricing, setting standards for making composite cement and so on.

Upgradation of Existing Plants and Research in Further Developed Technologies

- Funding from corpus of clean energy fund for cement sector for development of processes for using alternate fuel and municipal and solid waste and energy efficient technologies.
- NCCBM, which is primarily an R&D organisation would need support for development of infrastructure.

Development and Adoption of Nanotechnology

- Promoting collaborative research involving national and international laboratories on technologies to produce nanoparticles and the latest characterisation techniques Establishing a well-equipped Centre of Excellence for development and adoption of nanotechnology practices to cement and concrete through PPP mode.

Improving the Transportation Facilities for Cement Industry

- Rail transport: Railway should try and attain a share of 50 per cent in total dispatches of cement and clinker.
- Road transport: Load carrying capacity of trucks may be increased to 1 tonne.
- Inland waterways: Sufficient infrastructure need to be provided at IWT terminals/jetties to integrate with other modes of transportation.

SECTORS FOR DEPTH AND VALUE ADDITION:

AUTOMOTIVE

Introduction

50. The automotive industry is also a key sector for the Indian economy. Owing to its deep forward and backward linkages, it has a strong multiplier effect and acts as one of the drivers of economic growth. With the gradual liberalisation of the automotive sector in India since 1991, the numbers of manufacturing facilities have grown progressively. It produces a wide variety of vehicles ranging from passenger cars to heavy commercial vehicles to tractors and other agricultural equipments and so on.

51. The competitive paradigm for the automobile sector world over is rapidly undergoing complete transformation on account of environmental and energy security concerns. It is estimated that by 2020, electric vehicle (EV) and other green cars will

represent up to one third of total global sales in developed markets and up to 20 per cent in urban areas of emerging markets. The Indian auto sector which has close linkages with international auto industries will be deeply impacted by the evolving trends.

Key Objectives Under the Twelfth Plan

52. The Auto Policy of the Government had the following objectives:

1. Exalt the sector as a lever of industrial growth and employment and to achieve a high degree of value addition in the country
2. Promote a globally competitive automotive industry and emerge as a global source for auto components
3. Establish an international hub for manufacturing small, affordable passenger cars and a key centre for manufacturing tractors and two-wheelers;
4. Ensure a balanced transition to open trade at minimal risk to the Indian economy and local industry
5. Conduce incessant modernisation of the industry and facilitate indigenous design, research and development
6. Steer India's software industry into automotive technology
7. Assist development of vehicles propelled by alternate energy sources
8. Development of domestic safety and environmental standards at par with international standards

53. The Automotive Mission Plan 2006–16 laid down a 10 year road map for the industry The specific targets set up AMP are as follows:

- To continue to be the world's largest tractor and three-wheeler manufacturer in the world.
- To continue as the world's second largest two-wheeler manufacturers.
- To emerge as the world's fifth largest car producer (as compared to the seventh largest currently).
- To become world's fifth largest commercial vehicle manufacturer.
- Automotive sector would double its turnover ratio to India's GDP in 10 years.
- To export USD 35 billion by 2016.

54. The industry is planning to take a mid-term review of the AMP in 2013 and come up with objectives and targets for beyond 2016.

Government Initiatives

55. Government has also decided to constitute National Council for Electric Mobility (NCEM) and National Board for Electric Mobility (NBEM) for fast policy and decision making at the apex level for promoting electric mobility and for encouraging manufacture of electric vehicles in the country. Deliberations at the level of NBEM have been initiated to define short-term and long-term objectives and to develop short-term/long-term plans.

56. To address the issue of lack of testing infrastructure, a Plan scheme—National Automotive Testing and R&D Infrastructure Project (NATRIP) was initiated in the Tenth Plan. With the coming up of NATRIP facilities (in the first year of the Twelfth Plan), the industry would be in a position to adopt higher safety standards. NATRIP implementation Society (NATIS) is overseeing the implementation of NATRIP.

Strategy and Key Recommendations

- Providing an enabling environment to the industry to encourage growth, promote domestic competition and stimulate innovation to achieve operational efficiency.
- Removal of taxation on interstate movement of goods to make the Indian market a genuine 'free trade area' domestically.
- A stable import tariff structure consonant with the AMP that encourages investments rather than trade in fully built vehicles.
- Continuation of lower excise duty (in future GST) for manufacture of vehicle types that are a national priority for the country.
- Ensuring that the Free Trade Agreements being entered into with other countries do not distort markets for Indian automobile and auto component manufacturers.

- Inadequate availability of skilled labour—to be addressed with partnership with NSDC.
- Government to prepare a strategy paper on utilisation of different fuels in the transport sector to meet our national priorities of emission control, energy security as well as fuel efficiency
- Evolving the emissions and fuel availability road map beyond 2010
- Deepening competence in manufacturing of fuel efficient cars and electric vehicles including the hybrid segment.
- User incentives for adoption of EVs.
- Auto component industry needs to be supported by the Government by easing access to capital, logistic and infrastructure development in auto component hubs and so on.
- To address the issue of road safety, an appropriate regulatory body would be required.

DRUGS AND PHARMACEUTICALS

Introduction

57. Indian pharmaceutical industry is one of the high performing knowledge-based segments of the Domestic Manufacturing Sector. The soft patent regime prior to 2005 provided opportunity for this industry to consolidate its position and witness significant growth in generic production and exports. Indian pharmaceutical Industry has entered an era in which it has to play a pivotal role in providing generic medicines to the world and also become a global hub for R&D activities. Despite our success, we are still at the periphery of a vast unexplored opportunity. At this juncture, it is all the more important to recognise the challenges and opportunities and realign our strategies along with appropriate policy and institutional frameworks for shaping the future of the Indian pharmaceutical industry.

Key Objectives Under the Twelfth Plan

- The Indian pharmaceutical sector should grow to US\$ 60 billion size in 2017 (CAGR of 18 per cent) and have a 5 per cent share of the global pharmaceutical industry by the end of the Twelfth Five Year Plan. By 2020, the sector should be at US\$ 100 billion.
- Exports should be at INR 1,30,000 crores by the end of the Twelfth Five Year Plan.
- The sector should employ 1.5 million people by 2015, 1.898 million people by 2018 and 2.464 million people by 2022.
- Domestic R&D should be internationally competitive.
- Universal access of quality medicine at affordable prices.
- Improve domestic content in medical devices.
- Make all the CPSUs self-sustaining by 2020.

Strategy and Key Recommendations

58. The recommendations are summarised below:

- Capacity building of private sector to meet WHO–GMP standards and other international manufacturing standards.
- Enabling the Indian pharmaceutical industry to develop competence in advanced areas of drug manufacturing like dedicated research facility in bulk drugs, improving processes of manufacturing generics and new APIs.
- Developing common infrastructure in drug discovery and development, such as, manufacturing, distribution, exports, medical devices and so on.
- Appropriate coordination between relevant ministries/departments and stakeholders to build a coordinated strategies to tackle non-tariff barriers through counter measures and during signing of FTAs.
- Develop competencies for 2D Bar-coding for SMEs.
- Developing capacity of Central Drug Standards and Control Organisation to ensure timely clearance for new drug trials, pharmaco-vigilance, and assistance to the willing industry members to shore up their technical capacities for better regulatory compliances and adequate number of labour inspectors.
- Developing, evolving and rationalising regulatory frameworks for biosimilar drugs, fixed-drug combinations, clinical trials and early drug development.
- Developing the ecosystem to take advantage of the opportunity in clinical research and development of Clinical Research Centres for high-risk trials such as Phase-I.
- Create a level-playing field for domestic manufacturers in the bulk drugs industry.

59. Induce higher levels of research and development:

- Strengthening the NIPERs to boost patent filing from these institutes.
- Improving industry–academia linkages by creating a strong platform for incentivising innovation in producing safe, affordable medicine, arranging public–private partnerships with industry and leading academic partners.
- Providing incentives for New Drug Development.

60. Review the regulatory system including expanding tax deduction (to cover activities such as international patenting costs, regulatory consultants, outsourced R&D services and patent litigation expenses), reducing approval timelines and so on.

- Improving access to quality healthcare promotion of unbranded generics through Jan Aushadhi Stores (JAS) Ministry of Health needs to bring out legislation for prescription of medicines in generics nomenclature by the doctors on a mandatory basis.
- Inducing greater level of domestic manufacture of medical devices by creating infrastructure and parks for setting up green-field medical devices and equipment units and setting up a National Centre for Medical Devices.
- Enabling CPSUs to be self-sustainable by upgrading the existing manufacturing facilities to WHO–GMP compliance.

61. India, with its significant advantage of low cost of innovation, low capital requirements and lower costs in running facilities, well-established manufacturing processes, R&D infrastructure, is strategically well positioned to emerge as a major force to reckon with in the pharmaceuticals sector.

62. Moving to a higher growth trajectory will require focussed institutional support and incentivise the clusters to foster innovation, encouragement to maximise investments in enhancing manufacturing capacities and aggressive drive for creation of 'Brand India' image in select segments including biopharmaceuticals/biosimilars and Indian systems of medicines.

CHEMICAL

Introduction

63. The domestic chemical industry is heterogeneous in nature comprising organic, inorganic, petrochemicals, dyes, paints, pesticides and specialty chemicals manufactured in the small scale and large units (including MNCs). In the global context, the industry is increasingly moving eastwards in line with the shift of its key consumer industries (for example, automotive, electronics and so on) to leverage greater manufacturing competitiveness and share of Asia in the global chemical industry has risen from 31 per cent in 1999 to 45 per cent in 2009. With the current size of \$108 billion, the Indian chemical industry accounts for ~3 per cent of the global chemical industry.

Key Objectives Under the Twelfth Plan

- Ensuring optimal allocation of resources for adequate feed stock (coal, natural gas, naphtha and refinery cuts) to industry.
- Developing new and more energy efficient and environment-friendly/green technologies and processes.
- Clustering and providing common infrastructure to units.

Strategy and Key Recommendations

Ensuring Availability of Feed Stock

- Refinery configuration to focus on optimisation of availability feedstock and source feedstock from feedstock rich countries through , long term contracts.
- NCL and IICT to take initiative towards development of processes to use bio-based raw material instead of crude-based ones.

Development of Common Infrastructure

- Set up Greenfield PCPIRs and R&D parks through public private partnership.
- Establish a site operator, with the right functional expertise, to market and manage each PCPIR.

Focus on R&D

- Establish chemical sector specific council having representation of stakeholders to develop the innovation road map for chemical industry.
- Develop dedicated innovation centres in universities for chemical industry.

Focus on Green Technology and Consolidation of Environmental Regulations

- Consolidation of rules governing environment protection for chemical industry.
- Development of green technologies—implementation of the related provisions and fiscal measures of the National Manufacturing Policy.
- Central and State Government to work together to ensure more rigorous and transparent enforcement of pollution-related and environment-related regulations in chemical units.

Human Resource Development

- Setting up specialised vocational training centres in the clusters for chemical industry.

Other Strategies

- Fiscal incentives to the chemical sector for tackling the threat from cheap imports.
- Simplifying the process of registration of pesticides to boost export possibilities.
- Better testing mechanisms for tackling the problem of spurious pesticides.

PETROCHEMICALS

Introduction

64. Petrochemicals are chemicals derived from petroleum or natural gas and they form an essential part of the chemical industry today. Due to its very nature, Petrochemicals is an ‘enabler’ industry playing a vital role in the functioning of virtually all key sectors in the economy including packaging, agriculture, infrastructure, healthcare, textile and consumer goods. Petrochemicals provide critical inputs which enable other sectors to grow. Even though this industry is capital and technology intensive, the downstream sector is a major avenue for large-scale employment. The downstream plastic processing industry employs over 3.53 million people who derive their livelihood from this sector.

Key Objectives Under the Twelfth Plan

- Developing new technologies
- Reducing the environmental impact of the sector
- Development of clusters

Strategy and Key Recommendations

Technology Upgradation

- Setting up a petroleum research and development fund under PPP model.
- Augmenting existing testing centres to act as certifying agencies for testing plastic products and raw materials to meet international as well as BIS standards.

Ensuring Sustainable Growth of the Sector

- Setting up a code of conduct for the industry and permitting certain types of industries, beyond a particular size only if they can ensure zero discharge.
- Fiscal incentive to encourage use of renewable feedstock, adoption of green processes and build energy-efficient housing.
- Focus on recycling industry.

Creating Infrastructure

- Formation of industrial clusters/plastic parks—benchmarking with similar clusters in China, Singapore, Taiwan and so on, and other areas which have successfully built such facilities over the years to serve as a blueprint on policy actions.

Human Resource Development

- Specialised programmes for technical training, which can address the specific requirements of plastic industry.

Other Policy Initiatives for Promoting the Sector

- Branding 'made in India' products for increasing export competitiveness of the sector.
- Ensure strict and effective enforcement of the 'Edible Oil Packaging (Regulation) Order', 1998 by all State Governments.
- Encourage use of plastic packaging in key applications, for example, milk packaging.
- Encourage the use of plastic components in housing to reduce energy requirements.

PAPER

Introduction

65. The Indian Paper industry produces 10.11 million tons of paper per annum and accounts for 2.6 per cent of total world production. The annual turnover of the Indian paper industry is nearly ₹30,000 crores and it employs about 3.70 lakh people. Per capital consumption of paper in India is also very low. Most of the paper mills are in existence for a long time and hence technologies used by them fall in a wide spectrum ranging from oldest to the modern.

66. As many as 30 large integrated paper mills, accounting for about 31 per cent of total domestic production, use wood-based/bamboo-based pulp. One hundred and fifty paper mills, contributing 22 per cent of domestic production, use agro-based (bagasse and straws) and about 473 mills, accounting for 47 per cent of total production, use recycled fibre or waste paper for paper production.

Key Objectives Under the Twelfth Plan

- Developing new technologies
- Improving availability of raw material
- Development to be environmentally sustainable

Strategy and Key Recommendations

67. The deliberations of the working group on Pulp and Paper Sector have shown that expected increase in demand of paper in the country will require considerable increase in the indigenous production base of the paper sector in the next 15 years. Clearly, this would require in-depth planning to address critical issues like non-availability of fibrous resources, technological obsolescence and lack of economies of scale. The group has come out with a set of recommendations in respect of areas requiring improvement and focus. The key recommendations are given in the Box 13.5.

Box 13.5 Key Recommendations

- Ensuring availability of basic raw material and power
 - Wood: Large scale promotion of agro based plantation and substantial improvement in productivity of agro based plantation activity; Restoration of degraded forest land
- Bagasse: Review of incentives policy for use of bagasse in sugar mills,
- Identification and promotion of alternate lingo-cellulosic raw materials
- Setting up waste paper collection centres and creation of awareness
- Modernising entire RCF/WP bases industry to adopt state of the art technology
- Technology improvements for better energy efficiency and reduced environmental impact
 - Improving energy efficiency of existing and designing of incentives for technology upgradation for paper industry
 - Development of indigenous technologies to make agro-based industries competitive and environmentally sustainable
 - Development of energy efficient technologies
 - R&D institutes like CPPRI to be strengthened with appropriate funding support
- Support for indigenous manufacturing facility for capacity expansion.
- Fiscal measures to support the sector
- Rationalisation of duty structure to address inversions, if any
- Assistance to forestry/plantation

68. The Indian paper and pulp industry has potential and also capabilities to service the growing demand in domestic and international market. It can also create huge employment avenues in rural India through agro-forestry and can provide direct employment in production at mills through capacity addition/expansion, provided the competitiveness of the value chain is ensured. This warrants an enabling policy environment to gear up productive capacity, ensure varied raw material options, induce new technologies and promote local innovation.

(B) SECTORS FOR EMPLOYMENT GENERATION

TEXTILES

Introduction

69. The strength of the Indian textiles and clothing industry lies in its strong raw-material base, indigenous design capabilities, presence in the entire value chain, large and growing domestic demand, and the availability of trained manpower at internationally competitive rates. The Indian Textiles and Clothing Industry consumes a diverse range of fibres and yarns but is predominantly cotton based.

70. The sector plays a pivotal role in the economy, contributing about 12 per cent of the manufacturing output, 11 per cent of merchandise exports and employs about 45 million people. It has a major presence in the unorganised sector as compared to the organised sector, both in terms of the workforce and number of enterprises.

Key Objectives Under the Twelfth Plan

71. The growth of this Sector is crucial to the realisation of targets relating to total output and employment growth. The key objectives of the Textile sector for the 12th plan period are:

- Achieve an annual average growth rate of 11.5 per cent in volume terms in cloth production and 15 per cent in value of exports by increasing domestic value addition and technological 'depth' and by enhancing the global competitiveness.
- It is expected that training to 35 lakh persons would be provided.
- Additional employment to the tune of 15.81 million by 2016–17 would be created.

Strategy and Key Recommendations

72. Based on the lessons learnt in the Eleventh Plan and continuing with the thrust on technology up gradation and modernisation, the Twelfth Plan envisages critical interventions in the weaker segments of the textile value chain such as processing and garmenting. The main elements of the strategy for the Textiles Sector would be as under:

Technology with Focus on Weaving and Processing Sectors

73. The benefits of the Technology Up gradation Fund Scheme (TUFS), have mainly been availed by the Spinning and Composite Sectors. While investments in the spinning sector may be required to ensure yarn availability and domestic value addition of cotton, it is also important to promote forward integration. A study by CRISIL has recommended that the interest subsidy for spinning should be allowed only when it is accompanied by matching investments in weaving or knitting. Investment for technology up gradation in the downstream segments of weaving and processing is necessary to ensure that maximum quantity of yarn produced in the country is converted into spinning products domestically.

Infrastructure

74. The Scheme for Integrated Textile Parks (SITP) was launched in 2005 to neutralise the weakness of fragmentation in the various sub-sectors of textiles value chain, and the non-availability of quality infrastructure, with only 9 projects completed of 40 projects sanctioned in the 11th Plan, impact of these Parks is yet to emerge.

75. There is little evidence of vertical integration in these parks, which specifically encourages both forward and backward linkages in the entire textile value chain. It would be prudent to focus on consolidation of the gains for existing Parks. The proposed new scheme of setting up of Integrated Apparel Clusters, activities laid down in the Technology Mission for Knitwear and Wovenwear should be subsumed in SITP.

Cotton Sector

76. As per the evaluation study carried out by ICRA Management Consultancy Services Limited, trash content in Indian cotton has reduced from high levels of 4–8 per cent during the pre-TMC period to 1.5–3 per cent post modernisation under Mini Mission-IV of the Technology Mission on cotton. Under Mini Mission-III, up-gradation/improvement in the Market Yards has arrested the level of contamination. Based on the estimated cotton production of 438 lakh bales by the end of the terminal year of the Twelfth Five year Plan, MM-III and IV should make efforts for modernisation of G&P factories and Market Yards.

Environmental Concerns

77. The major challenges faced by the textiles processing are availability of water, effluent treatment and disposal of the treated water and solid effluents. A scheme for Common Effluent Treatment with Marine Outfall for the existing textile processing clusters on a PPP mode needs consideration.

Jute

78. Dependence of Jute Mills on Government orders the Jute Mandatory Packaging Act is one of the major barriers to modernisation and product diversification within the industry. The Jute Sector must plan for a gradual phasing out of this order and achieve more self-reliance through modernisation and diversification.

79. The major focus of interventions during the Twelfth Plan would be on aggressive implementation of Technology Mission on Technical Textiles which would include implementation of regulatory framework in specified areas, encouraging indigenous production of specialty fibres and yarns, encouraging investment in high end technical textiles products, including FDI, encouraging R&D in technical textiles, formulation and notifications of standards by BIS and ensuring availability of data base.

Silk

80. India is the second largest producer of silk in the world, a distant second to China, with 15.50 per cent share of the world production.

81. The objectives in the Twelfth Plan would be to facilitate and create conducive conditions for achieving the targeted silk production of 32,000 M.T. at a CAGR of 7.14 per cent by the terminal year of the Twelfth Plan. This would be done through intensive efforts in R&D, technology transfer and enterprise development, creating an inbuilt pyramid structure of federated farmers and farmer associations to synergise and synchronise the production processes. Also, efforts will be directed to develop 3rd Generation multivoltine crossbreeds to increase production and matching quality parameters of bivoltine silk and accelerate the growth in vanya silk production and explore better value realisation in domestic and international markets.

Powerlooms

82. The decentralised powerloom sector plays an important role in the textile economy in terms of fabric production and employment generation. It contributes 62 per cent to the total fabric production in the country and provides employment to the tune of 57.2 lakh persons.

83. The interventions required for Powerloom Sector development during Twelfth Plan period include Powerloom Cluster Development Programme, setting up of Common Facility Centres, Yarn Bank, setting up of Design Development Centres in the clusters, conducting awareness programmes/seminars/workshops/pilot activities and Distress Relief Fund Scheme for powerloom weavers. An exclusive provision for Powerloom Sector under TUFSS for its modernisation and creation of an office of the Powerloom Commissioner need to be considered.

Wool and Woollens Textiles

84. The woollen industry in the country is of the size of ₹10,000 crore and broadly divided and scattered between the organised and decentralised sectors. India has the third largest sheep population in the world, having 6.40 crore sheep producing 43.30 million kgs of raw wool, out of which, about 85 per cent is carpet grade wool,

85. It has been estimated that the raw wool production and imports would double from 114.2 million kg in 2008–09 to 260.8 million kg by 2019–20. During the period 2009–10 and 2014–15, exports of woollen yarn fabrics and made-ups are expected to record a CAGR of 11.6 per cent.

86. There is a need to have proper data base and action plan to reduce mortality rate of sheep, increasing coverage of shepherds as well as sheep under insurance, faster development of CFCs, improvement in productivity in wool production. Thrust of the scheme/programmes has to be oriented accordingly.

Human Resource Development

87. As per the study conducted by National Skill Development Corporation, with the overall growth of 9.5 per cent in the Textiles and Clothing Sector, its incremental human resource requirement would be about 17.8 million by the end of Twelfth Plan.

FOOD PROCESSING INDUSTRIES

Introduction

88. As a leading producer of food grains, milk, fruits and vegetables, India has the advantage of adequate food at the farm gate to ensure food security for the nation and to even have a surplus for exports. Food processing industry in India has immense potential for boosting the rural economy as it brings about synergy between consumers, industry and agriculture. A well-developed food processing industry is expected to increase farm-gate prices, reduce wastages, ensure value addition, promote crop diversification, generate employment opportunities and boost export earnings.

Key Objectives Under the Twelfth Plan

89. Following are the main objectives for the Twelfth Plan:

- Develop the food processing sector to enable containment of food inflation and food wastage
- Create 1 million additional jobs during the Twelfth plan period

Strategy and Key Recommendations

90. Based on lessons learnt during Eleventh Plan and keeping in view the priorities of the proposed Manufacturing Plan, the strategy for 12th Plan has been devised based on three basic principles. Firstly, greater emphasis would be laid on decentralised process of implementation with greater involvement of states in selection of projects vis-à-vis beneficiaries and monitoring their implementation.

91. Secondly, instead of project implementation, focus would be on policy making and coordination so as to address critical issues impacting the value chain in the sector. Lastly, the existing focus on infrastructure development will be continued with expansion of scope and depth so as to ensure sustainability of the value chains. The major recommendations in regard to Twelfth Plan activities are in Box 13.6.

92. Adoption of a decentralised approach to instil greater involvement of states and appropriate coordination between states and stakeholders is a well-conceived idea for development of Food Processing Sector. Launching a National Mission on Food Processing (NMFP) will be appropriate vehicle to carry forward the idea of decentralisation.

Box 13.6

Key Recommendations

- Setting up of National Mission on Food Processing to improve coordination and implementation of schemes and to enable greater involvement of state governments.
- Expanding and modifying existing infrastructure development schemes
 - Mega Food Parks Scheme, Integrated Cold Chain Scheme
- Setting up and Modernisation of Abattoirs—Establishment of new abattoirs and modernisation of existing abattoirs
- Develop and strengthening of existing and new institutions
- Taking up a nation-wide skill development programme along the lines of special projects for skill development of rural youths under SGSY of MoRD.
- Putting in place a network of food testing labs (Government/Private) through providing incentives.
- Encouragement for larger participation in Codex deliberations and setting up/strengthening of Codex Cell in FSSAI to promote, coordinate and monitor related initiatives at the level of stakeholders
- Setting up of an Innovation Fund and Venture Capital Fund for Food Processing to promote innovations and technology development

93. Likewise shift of focus of the Ministry from project implementation to policy initiative is in right direction towards holistic development of the sector. The policy to be effective will have to be comprehensive and should evolve through consultation with the states and the industry.

94. While basic agricultural research has strong and large institutional network in the country, there is inadequate focus on the food processing sector. There is an urgent need for building a bridge between agricultural universities, premiere technological and industrial research institute and the private sector to actively undertake collaborative strategic research in this important sector.

95. Apart from National Institute of Food Technology Entrepreneurship and Management (NIFTEM), the Central Food Technology Research Institute (CFTRI) should play a more central, pro-active role to strengthen knowledge base of the industry through greater public and private partnership in technology development.

96. Another critical objective should be for the industry to reach international standards of food safety and quality. All efforts should be made to harmonise Indian Food Standards with Codex. Enactment of the comprehensive legislation, the Food Safety and Standards Act, 2006 in the recent past has already provided an enabling vista for taking the above aspects forward.

97. Last but not the least; it is required to recalibrate the existing schemes of MFPI for greater effectiveness. The proposed Centrally Sponsored Scheme of NMFP has to be structured in such a manner so that it is efficiently managed. It may also be worthwhile for new mega food parks to explore options of identifying one or more anchor industry(ies) to speed up their pace of implementation.

LEATHER AND LEATHER GOODS

Introduction

98. The leather and leather products industry occupies an important position in the Indian economy in view of its massive potential for employment generation, potential for growth both in domestic and export markets. The leather industry is spread in different segments, namely, tanning and finishing, footwear and footwear components, leather garments, leather goods including saddlery and harness and so on.

Key Objectives Under the Twelfth Plan

- To increase the number of employed in the industry—ensuring the availability of trained/skilled labour
- To improve the export competitiveness of our products and facilitating exports
- Improving the scale of businesses in the sector
- Ensuring clean processes (environmental pollution)
- Improving the social conditions

Strategy and Key Recommendations

Attracting Large Scale Investments through FDI and Domestic Companies

- Promoting the model adopted China and Vietnam to build a strong leather industry, Promotional activities in foreign countries to be carried out in various formats, print campaign, investment meet, missions for collaborations on raw materials and so on.

Skill Development Initiatives

- Establishment of new Footwear Design and Development Institutes (FDDI) to skill deficit in the sector.
- Support to Artisans' scheme—360 degree intervention plan.
- Placement linked Skill Development Programme and Training of Trainers—For providing employment opportunity and to fill the demand of operators in the footwear sector and improving the quality of training.

Ensuring Environmental Sustainability

- Animal Husbandry Measures, Slaughter and Skin Collection Improvement Measures and Rural Tanning Improvement Measures.
- Technology Upgradation and Modernisation, environmental impact upgradation and technology benchmarking of Tanneries.

Improving Export Competitiveness

- Brand Building and Indian Leather Mark
- Constitution of Domestic Council—Footwear and Leather Products Development and Promotion Council (FLPDPC)

Others

- Improving the availability of raw-materials

GEMS AND JEWELLERY

Introduction

99. India's Gem and Jewellery (G&J) industry is an important foundation of the country's export-led growth. It is a leading foreign exchange earner and one of the fastest growing sectors accounting for 16.67 per cent of India's total merchandise exports during FY 2010-11. India now accounts for nearly 55 per cent of world net exports of cut and polished diamonds in value terms, 90 per cent in terms of pieces and 80 per cent by cartage. The industry employs about 2 million highly skilled workforce out of which one million are exclusively engaged in export production.

100. India is known to be the largest consumer of gold in the world. It is estimated that the current annual demand for gold in the country is well over 800 tonnes. Naturally India is also the largest fabricator of gold.

101. In the diamond segment, the industry is importing rough diamond from countries such as Belgium, UK, UAE, Israel, Hong Kong, Switzerland and other mining countries. The polished diamond is exported to countries such as UAE, Hong Kong, USA, Belgium and Israel.

Key Objectives Under the Twelfth Plan

- To ensure access and availability of raw material to the industry
- To make Indian products attractive at global markets

Strategy and Key Recommendations

Secure Raw Material Sources:

1. Diamond
 - Restrict the export of rough diamonds from domestic mines and invest in diamond reserves abroad through PPP to ensure the sustained availability.
2. Gold
 - Explore possibility of free import of precious metal gold for manufacturing exports.
 - Examine option of permitting import of gold as per international practice in place of current practice of import by canalising agencies to erratic supply and frequent shortages.
3. Coloured Gem Stones
 - Commissioning exploration programmes and surveys to ascertain availability of coloured gemstones in India.

Training and Development

- Create Sector Skill Council, under the aegis of NSDC, GJEPC and other critical stakeholders. Develop and administer 'Train the Trainer' programmes, create training infrastructure and roll out the training programmes.

Research and Development and Technological Upgradation

- Documentation of existing tacit knowledge of traditional artists.
- Develop a Design Centre of Excellence and Product Development at Mumbai.

Infrastructure Facilities

- Setting up Gem Bourses, jewellery parks/clusters, Gem trading centres and G&J training centres in some key cities across the country.

Marketing and Brand Promotion

- Creation of a fund with contribution of industry to promote 'Made in India' brand image across the globe.
- Appropriate measures by Government of India to have access in the untapped market for G&J products.
- Government should encourage the participation of the industry in international trade forums.

Regulatory and Fiscal

- Introduction of Turnover based taxation system for Indian Gem and Jewellery industry.
- Relaxation in EPC norms for import of machineries from Italy.
- Allowance of External Commercial Borrowings for working capital as well.
- RBI to allow financing for retail jewellery business abroad.
- Create dollar fund to refinance banks to finance industry at competitive international rate.
- Introduction of adequate credit guarantee mechanism for Gem and Jewellery Sector.
- Decrease of transaction cost—Introduction of regulatory control like IRDA to monitor the different transaction charges that an exporter pays to the different government agencies and financing institutions.

KHADI AND VILLAGE INDUSTRIES

102. The broad targets for development of Khadi and Village industries sector during the 12th Plan period are to achieve at least 11 per cent growth in Khadi sector and 13 per cent growth in Village Industries. The strategy for achieving targets are to develop product-wise clusters of Khadi and Village Industries products and develop their domestic as well as export market, introduce innovations in design and technology, creation of entrepreneurship and growth in manufacturing in rural non-farm sector to prevent migration by enhanced allocation for PMEGP. The Khadi Reform Programme has been taken up in the 11th Plan for up scaling marketing of Khadi Products and improving earning of Khadi artisans. The reform also includes introduction of Khadi mark, strengthening Khadi Institutions, market promotion of Khadi products and participation of private party in the form of partnership in the existing establishment of Central Silver plants. The process has been slow and needs to be stepped up in the 12th Plan. Also, outcomes need to be clearly defined.

103. Although the PMEGP is the flagship Programme under KVIC, it is yet to be evaluated in terms of its efficacy. A quick evaluation is warranted before any major up-scaling. Likewise an evaluation of the cluster based initiative by the name of SFURTI is also necessary to evaluate how shortcomings can be overcome while taking up the proposed expansion and introduction of Heritage Clusters. Since the Textile Ministry has been implementing such clusters in Handloom and Handicrafts sectors it would be desirable to ensure convergence whenever possible and avoid duplication.

COIR INDUSTRY

104. Coir Industry is mostly confined in Southern states namely, Kerala, Tamil Nadu and Karnataka. Enterprises in this sector are usually in Micro and Small sector. At present, products manufactured in the Coir Sector are for limited uses. R&D initiatives have been made by the Central Coir Research Institute in Kalavoor and the Central Institute of Technology in Bangalore to develop innovative products for diverse uses. Under the Prime Minister's Gram Sadak Yojana (Bharat Nirman), it has already been decided to use Coir geo-textiles for construction of rural roads in nine States. In future, the project is likely to be extended to all the 28 States of the country. The coir industry is likely to face problems in catering to the huge requirements. Hence it may be required to infuse appropriate technology to improve quality and up-scaling manufacturing capacity in the Twelfth Plan to meet the requirements.

The Twelfth Five Year Plan (2012–17) outlays (GBS) for the sectors discussed above are given in Annexure 13.3.

ANNEXURE 13.3
Twelfth Five Year Plan (2012–17) Outlays (GBS) for Industry Sector

TABLE 13.10
Ministry/Department-wise Twelfth Five Year Plan (2012–17) Outlays Industry Sector

(₹ Crore)					
S. No.	S. No. of Annex. 3.2	Ministry/Department	Budgetary Support	IEBR	Outlay
1	34	Department of Chemicals and Petrochemicals	2,890	3.00	2,893.00
2	35	Department of Pharmaceuticals	2,968	127.00	3,095.00
3	36	Department of Fertilisers	1,484	15,437.00	16,921.00
4	40	Department of Industrial Policy and Promotion	12,601	0.00	12,601.00
5	43	Ministry of Corporate Affairs	233	0.00	233.00
6	52	Ministry of Food Processing Industries	5,990	0.00	5,990.00
7	53	Department of Heavy Industry	4,680	17,543.00	22,223.00
8	54	Department of Public Enterprises	50	0.00	50.00
9	27	Ministry of MSME	24,124	1,890.00	26,014.00
10	56	Ministry of Mines	2,332	18,221.00	20,553.00
11	64	Ministry of Steel	200	90,975.00	91,175.00
12	65	Ministry of Textiles	25,931	0.00	25,931.00

NOTES

1. According to NASSCOM—for all graduates (not only related to manufacturing).
2. Aon Hewitt Survey.
3. ASI 2008–09 data shows ~9 per cent of workforce at supervisory and above levels. Assumption of 9 per cent continued for calculating managerial staff requirement in 2025 (organised and unorganised).
4. Recommended changes include (i) Defined limit of investment in plant and machinery for classifying the micro, small and medium enterprises may be deleted from the MSMED Act, 2006 and should be announced through Notifications. (ii) The monetary limit of penal provisions of MSMED Act, 2006 should be provided in Rules instead of in the Act. (iii) Delayed payment of earnest money/security money should be included for payment of penal interest in case of MSEs as per provision in Chapter 5 of MSMED Act, 2006. (iv) Amount of award given by Micro and Small Enterprises Facilitation Council should be realizable as arrear of land revenue.
5. The UWSSA provides for a National Social Security Board at the Central level and for welfare schemes to be formulated

by the Central Government on matters relating to (i) health and disability cover, (ii) health and maternity benefits, (iii) old age protection, and (iv) any other benefits as may be determined by the scheme (Indira Gandhi National Old Age Pension Scheme, National Family Benefit Scheme, Janshri Bima Yojana, Rashtriya Swasthya Bima Yojana and so on. are among the welfare schemes notified in Schedule 1 of the Act under the Central Government). The Act provides a State Social Security Board at the state level to recommend suitable schemes in the State sector and monitor social welfare schemes for unorganized workers. Schemes relating to (i) Provident Fund (ii) Employment Injury Benefit (iii) housing (iv) educational schemes for children (v) skill up gradation of workers, (vi) funeral assistance and (v) old age homes, is to be formulated and administered by the State Governments.

6. It is important to note though that the overall condition of the economy will be a key driver of sectoral growth rates. And emerging economic realities, especially globally, are likely to create some restraints in the growth of domestic manufacturing. Hence, deliberate effort is needed to implement the manufacturing strategy to boost the Indian manufacturing sector.

14

Energy

INTRODUCTION

14.1. India is the fourth largest consumer of energy in the world after USA, China and Russia but it is not endowed with abundant energy resources. It must, therefore, meet its development needs by using all available domestic resources of coal, uranium, oil, hydro and other renewable resources, and supplementing domestic production by imports. High reliance on imported energy is costly given the prevailing energy prices which are not likely to soften; it also impinges adversely on energy security. Meeting the energy needs of achieving 8 per cent–9 per cent economic growth while also meeting energy requirements of the population at affordable prices therefore presents a major challenge. It calls for a sustained effort at increasing energy efficiency to contain the growth in demand for energy while increasing domestic production as much as possible to keep import dependence at a reasonable level.

ENERGY INTENSITY OF GDP

14.2. Energy intensity, defined as the energy input associated with a unit of gross domestic product (GDP), is a measure of the energy efficiency of a nation's economy. India's energy intensity has been declining over the years (See Table 14.1) and is expected to decline further.

14.3. Falling energy intensity implies that the growth in energy used is less than the growth of GDP, which in turn implies that energy elasticity, that is, the ratio of the growth of energy to the growth of GDP is less than unity. In fact, this elasticity has been declining over the years. Total primary energy–GDP elasticity

TABLE 14.1
Energy Intensity for Total Primary Energy*

Period	Energy Intensity (Kgoe/US\$)**
1981	1.09
1991	0.99
2001	0.85
2011	0.62

* Energy intensity indicated is energy required to produce a unit of GDP.

** kgoe: Kilograms of oil equivalent.

Source: Planning Commission.

was around 0.73 during the period 1980–81 to 2000–01 and it declined to 0.66 in the period 1981–81 to 2010–11. The elasticity of commercial energy is higher than that of total primary energy because of the ongoing shift from non-commercial to commercial energy. However, even this elasticity declined from a level of 1.09 in the period 1980–81 to 2000–01 and to 0.91 during 2000–01 to 2010–11. The decline in share of non-commercial energy could be attributed to increased availability of clean fuels and replacing traditional fuels such as wood and cow dung cakes to meet household energy needs. The Twelfth Plan continues to focus on enhancing household access to cleaner forms of energy with an aim to promote sustainable development.

14.4. A National Mission on Energy Efficiency (NMEE) has been launched to improve energy efficiency in all areas of the economy including power, transport, urban housing, consumer goods and

industries. As a part of Clean Energy Mechanism, which is a global initiative, a number of measures are being planned for improving efficiency in lighting by use of light-emitting diodes (LEDs) and super-efficient appliances. A strategy has also been devised to improve the share of energy-efficient modes of transport. This improvement in efficiency will lead to reduced energy intensity of GDP and lower elasticity of energy against GDP. It is estimated that during the Plan, the elasticity may further improve by about 10 per cent by the end of the Plan.

14.5. Table 14.2 shows energy intensity of some select countries for the year 2010, with GDP measured in terms of 2010 USD purchasing power parity (PPP). India's energy intensity using PPP GDP is 0.191, which is on par with the world average but higher than most of the European countries. China's energy intensity is roughly 1.5 times that of India.

TABLE 14.2
Energy Intensity

S. No	Country	Energy Intensity (Kgoe/US\$)
1	United Kingdom	0.102
2	Germany	0.121
3	Japan	0.125
4	Brazil	0.134
5	USA	0.173
6	China	0.283
7	South Korea	0.189
8	India	0.191

Source: World Energy Outlook 2011.

EXPANDING ACCESS TO ENERGY

14.6. Higher levels of GDP will obviously require higher levels of energy as an input but in addition to this requirement India's energy planning must allow for the need to expand access to clean energy at affordable prices for the bulk of the population. Village electrification and connection of rural households to electric supply under Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) is a critical instrument. The supply of kerosene/liquefied petroleum gas (LPG) at affordable prices is equally important.

14.7. There is ample evidence of unmet demand in rural areas indicating the need to expand access even as we expand total supply. The NSS 66th Round Survey conducted by National Sample Survey Organisation (NSSO) for 2009–10 shows improvement in access to cleaner forms of energy by households for cooking and lighting purposes as compared to the NSS 61st Round Survey for 2004–05. Access to electricity in this period increased from 92 per cent of urban households to 94 per cent and from 55 per cent of rural households to 67.3 per cent. Since 2009–10, 1.40 crore below poverty line (BPL) households have been provided electricity connection under RGGVY. If we add only the number of BPL households connected during last three years to the NSSO data, the estimated household electrification level as on 31 March 2012 would be of the order of 75 per cent. However, the availability of electricity supply continues to remain an area of concern, particularly in rural areas, where consumers get supplies for less than eight hours a day in certain states. Though 67 per cent of the rural households are reported to have access to electricity in 2009–10, their per capita consumption of electricity is only around 8 units per month, which is just one-third of reported consumption of 24 units in urban areas. This is because of poor quality of electricity supplies and reflects significant unmet demand.

14.8. Achieving universal access to electricity is one of the most important goals and the Government plans to provide electricity to each and every household in the country in the next five years by extending RGGVY programme to every habitation irrespective of the size of the population. Sub-transmission, distribution network and renewable sources will need to be expanded suitably in consultation with the State Governments to realise this objective. Adequate investments in the distribution networks will improve the quality of electricity supply for the existing consumers as well as the targeted consumers in the next five years

14.9. The percentage of all households using LPG as cooking fuel increased from 57 per cent of the households in 2004–05 to around 66 per cent in 2009–10. Access to LPG supplies in rural areas increased from

TABLE 14.3
Household Access (%)

Energy Source	61st Round 2004–05			66th Round 2009–10		
	Rural	Urban	Total	Rural	Urban	Total
Electricity	54.9	92.3	65.2	67.3	93.9	75.5
LPG	8.6	57.1	21.9	15.5	66.2	31.2

Note: Access to energy data for Census 2011 shows primary energy sources for lighting in 2011 as 55.3 per cent rural, 92.7 per cent urban and 67.2 per cent overall, as against 43.5 per cent rural, 87.6 per cent urban and 55.8 per cent overall in 2001. The difference in NSSO and Census data is possibly due to differences in questionnaire. It will need to be further looked into.

8.6 per cent in 2004–05 to around 15.5 per cent in the year 2009–10. Besides, per capita consumption reported in rural areas was just 0.3 kg per month as compared to 1.8 kg in urban areas. Since the disparity between urban and rural per capita total consumption is much lower it is reasonable to assume that potential in rural areas is much higher, but is left unsatisfied because of insufficient access. Women being the main energy users and primary energy suppliers are worst affected by restricted LPG supply. This poses one of the most difficult barriers to the empowerment of women. Table 14.3 shows the access levels in 2004–05 and 2009–10.

ENERGY DEMAND AND SUPPLY

14.10. The demand for energy during the Plan will increase as the economy grows and as access in rural areas expands. Table 14.4 presents estimates of the total primary energy demand projected to the end of the Thirteenth Plan. The annual average growth rate of the total energy requirement is expected to accelerate from 5.1 per cent per year in the Eleventh Plan to 5.7 per cent per year in the Twelfth Plan and 5.4 per cent per year in the Thirteenth Plan. The faster growth in supply in the Twelfth Plan is in part a reflection of the need to meet suppressed demand.

14.11. The demand for non-commercial energy is expected to decline with increasing expansion of the network and access to commercial energy. As shown in Table 14.4, whereas commercial energy is expected to grow at 6.91 per cent in the five years up to 2011–12, non-commercial energy is projected to grow at only 2.6 per cent in the same period. The growth of non-commercial energy is projected to decline to around 1.5 per cent in the next 10 years.

14.12. Table 14.5 shows the share of each energy source in total domestic production and also its share (including imports) in the total commercial energy consumption. The most important point to note is that coal remains the dominant source of primary energy. Domestic production of coal and lignite account for two-third of total production of commercial energy in 2000–01 and is projected to be about the same in 2021–22. As a percentage of total consumption of commercial energy, the share of coal and lignite is projected to increase to 57 per cent, from a level of 50 per cent in 2000–01. While share of oil in total commercial energy consumption is expected to decline from 37.5 per cent in 2000–01 to 23.3 per cent in 2021–22, the share of natural gas and liquefied natural gas (LNG) is projected to rise from 8.5 per cent to 13 per cent in the same period. The combined share of oil and natural gas in energy consumption was 24.7 per cent in 2011–12 and is expected to be about the same in 2021–22.

14.13. The supply from renewables is expected to increase rapidly from 24,503 MW by the end of the Eleventh Plan to 54,503 MW by the end of the Twelfth and 99,617 MW by the end of the Thirteenth. This fourfold increase in the next 10 years is expected to continue in subsequent years as policies provide a strong incentive for the renewables. Nevertheless the base is small and the share of renewables in total commercial energy used will remain small. It is expected to rise from about 1 per cent in 2011–12 to 1.43 per cent in 2016–17 and just under 2 per cent in 2021–22. Though small, the share of renewable energy in India is comparable with that in many other countries: USA (1.7 per cent), Indonesia (1.4 per cent), Thailand (1.0 per cent) and China

TABLE 14.4
Trends in Supply of Primary Commercial Energy

	2000–01 (Actual)	2006–07 (Actual)	2011–12 (Provisional)	2016–17 (Projected)	2021–22 (Projected)
(in mtoe)*					
DOMESTIC PRODUCTION					
Coal	130.61	177.24	222.16	308.55	400
Lignite	6.43	8.76	10.64	16.80	29
Crude Oil	33.40	33.99	39.23	42.75	43
Natural Gas	25.07	27.71	42.79	76.13	103
Hydro Power	6.40	9.78	11.22	12.90	17
Nuclear Power	4.41	4.91	8.43	16.97	30
Renewable Energy	0.13	0.87	5.25	10.74	20
Total Domestic commercial Energy	206.45	263.28	339.72	481.84	642.00
Non-commercial Energy 1	136.64	153.28 (1.93)	174.20 (2.6 %)	187.66 (1.5 %)	202.16 (1.5 %)
Total	343.09	416.56	513.92	669.50	844.16
IMPORTS					
Coal	11.76	24.92	54.00	90.00	150.00
Petroleum Products	77.25	98.41	129.86	152.44	194.00
LNG	0	8.45	12.56	24.80	31.00
Hydro power	0	0.26	0.45	0.52	0.60
Total Net Imports	89.01	132.04	196.87	267.76	375.60
Total Commercial Energy (growth over the previous five years)	295.46	396.32 (5.01 %)	536.59 (6.25 %)	749.60 (6.91 %)	1017.60 (6.30 %)
Total Primary Energy	432.01	549.60 (4.09 %)	710.79 (5.28 %)	937.26 (5.69 %)	1219.76 (5.41 %)

*mtoe: million tons of oil equivalent.

Source: Planning Commission.

Note: Figures in brackets are annual average growth rates over the previous five years' period.

(0.5 per cent). Brazil at (3.1 per cent) is significantly higher. We have made a good start but there is need to do more.

14.14. Even though domestic production of energy resources is projected to increase, import dependence will continue at a high level. The main area of import will be crude oil, where nearly 78 per cent of the demand will have to be met from imports by the end of the Twelfth Plan. However, import dependence for coal is also estimated to increase from 18.8 per cent in 2011–12 to 22.4 per cent by the end of the Twelfth Plan and 25.9 per cent by the end of the Thirteenth Plan. It is estimated that the import

dependence for coal, LNG and crude oil taken together in the terminal year of the Twelfth Plan is likely to remain at the Eleventh Plan level of 36 per cent. However, this assumes that we are able to realise projected domestic production levels of coal, petroleum and natural gas. If this is not achieved, the level of import dependence would increase further if the GDP growth rates projected are to be maintained.

ENERGY PRICING

14.15. Energy pricing is an economically important but also politically sensitive issue, which will pose major challenges in the Twelfth Plan. While the political sensitivity of energy prices is self-evident,

TABLE 14.5
Share of Each Fuel in Total Energy Production and Consumption

	2000–01 Actual	2006–07 Actual	2011–12 (Provisional)	2016–17 (Projected)	2021–22 (Projected)
(in percentage)					
Share in Commercial Energy Production					
Coal and Lignite	66.38	70.65	68.53	67.52	66.82
Crude Oil	16.18	12.91	11.55	8.87	6.70
Natural Gas	12.14	10.52	12.60	15.80	16.04
Hydro Power	3.10	3.71	3.30	2.68	2.65
Nuclear Power	2.14	1.86	2.48	3.52	4.67
Renewable Energy	0.06	0.33	1.55	2.23	3.12
Share in Total Commercial Energy Supply					
Coal and Lignite	50.36	53.22	53.45	55.41	56.90
Crude Oil	37.45	33.41	31.51	26.04	23.29
Natural Gas	8.49	6.99	10.32	13.46	13.17
Hydro Power	2.17	2.53	2.17	1.79	1.73
Nuclear Power	1.49	1.24	1.57	2.26	2.95
Renewable Energy	0.04	0.22	0.98	1.43	1.97

the economic role of rational energy pricing is not adequately appreciated. Rational energy prices help to balance consumer energy demand with producer supply, providing incentives to reduce consumption on the one hand and to stimulate production on the other. As a general rule, energy prices should be aligned with the global energy prices, especially when large imports are involved.

14.16. Misalignment of energy prices poses both microeconomic and macroeconomic problems. At the microeconomic level, underpricing energy to the consumer reduces the incentive to be energy-efficient and also promotes leakage of subsidised products for sale in open market and also (in case of kerosene) adulteration. Underpricing to the producer reduces both the incentive and also the ability to invest in the sector, depressing production and increasing reliance on imports. This obviously undermines energy security. At the macroeconomic level, misalignment either hits producers as stated above, leading to excessive import dependence with implications for the balance of payments, or if producers are sought to be insulated, it necessitates a subsidy, which places a burden on the budget.

14.17. Over the years, India's energy prices have become misaligned, and are now much lower than global prices for many products. The extent of misalignment is substantial, leading to large un-targeted subsidies. The implications of price misalignment are discussed in the individual sections relating to different sources of energy.

ENERGY SECURITY

14.18. Energy security involves ensuring uninterrupted supply of energy to support the economic and commercial activities necessary for sustained economic growth. Energy security is obviously more difficult to ensure if there is large dependence on imported energy. This calls for action in several areas.

1. First, and most importantly, the domestic production of coal, oil and gas and other energy sources has to be stepped up. Some of the recent issues in this regard have been availability of land, clearances for environment and forest and implementation of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. Uncertainty about

production sharing contracts has also posed problems. Management strategies and procedures will have to be devised for ensuring effective implementation of fuel development projects while meeting the requirements of above policies and legislations.

2. Second, a stable and attractive policy regime has to be provided to ensure substantial private investment including foreign investment in oil and natural gas blocks and new capacities for renewable energy. Producers must have clarity in the price they will receive and an assurance of a stable tax regime. Since oil exploration is a global industry the terms India offers must be comparable with those offered elsewhere. In this context the entire structure of New Exploration Licensing Policy (NELP) contracts for oil and gas need to be reviewed.
3. Third, investments in renewable energies need to be strongly emphasised. By present projections, the share of renewable energy in total energy consumption will only reach 2 per cent by 2021.
4. Fourth, investments in energy assets in foreign countries, especially for coal, oil and gas and uranium should be stepped up.
5. Fifth, to meet any possible disruption in oil supplies, on which we are import-dependent to the extent of more than 80 per cent, storage capacities need to be created. The Organisation for Economic Cooperation and Development (OECD) countries have generally created these capacities to the extent of 90 days of their domestic demand. We have created the capacity for 5 million tonnes. It has, however, not been fully utilised so far. There will be a need to increase this gradually and utilise it fully. Innovative ways will have to be found to fill up these tankages.

3.2. POWER SECTOR

14.19. The electric power sector consists of a mix of plants depending on different primary fuels, including conventional sources like coal, lignite, natural gas, oil, hydro and nuclear power; and non-conventional sources like wind and solar power, and agricultural and domestic waste. However, coal remains the dominant primary energy source used in power

generation accounting for 67 per cent of total generation. The power sector is currently at a crucial juncture of its evolution from a dominantly public sector environment to a more competitive power sector, with many private producers and greater reliance on markets, subject to regulation. The performance of the power sector shows many positive features, especially relating to the pace of addition to power generation but there are numerous problems relating to fuel supply which need to be resolved as also problems relating to the financial viability of the operation of the distribution companies (Discoms).

REVIEW OF THE ELEVENTH PLAN

14.20. The Eleventh Plan was the period in which the Electricity Act of 2003, which was enacted during the Tenth Plan period was to be fully operationalised. The objectives of the Act are “to consolidate the laws related to generation, transmission, distribution, trading and use of electricity, and taking measures conducive for the development of electrical industry, protecting interests of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of regulatory commission and establishment of Appellate Tribunals”. While substantial progress was made in setting up the institutional structure, there are several important areas where reforms have yet to take place. These are:

1. Open access to consumers, which is mandated under the Electricity Act, remains ineffective due to reluctance of state utilities to comply.
2. Trading of power at very high rates and its purchase by utilities even though not willing to pass on the higher cost in the form of consumer tariffs. This has a distortionary effect and threatens to jeopardise the financial viability of the Discoms.
3. Energy audit of power utilities has not been undertaken.
4. Electricity retail tariffs have remained static for many years because of political pressure, widening the gap between the average tariff and average cost of supply.

5. The distribution companies suffer from serious financial stress. Losses of the distribution utilities remain high. The annual loss of the State power utilities (without subsidy) was ₹33,698 crore during 2007–08 and increased to ₹59,891 crore in the year 2009–10 (provisional). The State Discoms cannot sustain such high losses indefinitely.

Physical Achievements

14.21. An important gain in the Eleventh Plan was the ramping up of the pace of addition to generation capacity. The Eleventh Plan aimed at a substantial increase with a target for additional capacity of 78,700 MW. Actual achievement in the Eleventh Plan was 54,964 MW. Sector-wise and mode-wise capacity addition achievements are given in Table 14.6. This is 30 per cent lower than the original target, but it is more than twice the addition achieved in the Tenth Plan. More importantly, the pace of capacity creation picked up in the Eleventh Plan,

and there is at present about 90,000 MW of generation capacity currently under construction which would achieve commercial production in the Twelfth Plan. If these projects proceed to completion as scheduled, and a strong effort is made to initiate new projects in the first year of the Twelfth Plan, we could reasonably expect to achieve addition to capacity in the Twelfth Plan of the order of 80,000–1,00,000 MW.

14.22. While the pace of addition to generating capacity is commendable, there has not been comparable progress in delivering fuel and the availability of both coal and gas to the new power plants is not assured. Resolution of this problem must have high priority in the Twelfth Plan.

14.23. The main physical milestones achieved in the power sector during the Eleventh Plan are summarised in Box 14.1.

TABLE 14.6
Installed Capacity Addition during the Eleventh Plan (in MW)

Type	Target				Actual			
	Central	State	Private	Total	Central	State	Private	Total
Hydro	8,654	3,482	3,491	15,627	1,550	2,702	1,292	5,544
Thermal	24,840	23,301	11,552	59,693	12,790	14,030	21,720	48,540
Nuclear	3,380	–	–	3,380	880	–	–	880
Total	36,874	26,783	15,043	78,700	15,220	16,732	23,012	54,964

Source: Central Electricity Authority (CEA).

Box 14.1

Achievements in Power Sector during the Eleventh Plan

- Capacity addition during the Eleventh Plan period has been at 54,964 MW which is 69.8 per cent of the original target and 88.1 per cent of the reduced target of 62,374 MW set in the Mid-term Appraisal (MTA). It is more than 2.5 times that of any of the earlier Plans.
- Total installed capacity as on 31 March 2012, including renewable energy sources of the country is 1,99,877 MW. The share of renewable energy capacity is about 12.2 per cent
- Approximately 69,926 circuit km (ckm) of transmission line, 1,50,362 MVA capacity of alternating current (AC) substations and 1,750 MW capacity of high-voltage, direct current (HVDC) substations were added to the existing transmission systems.
- Total number of villages electrified till March 2012 was about 5.6 lakhs, indicating that more than 93 per cent village electrification has been achieved. However, a large number of small habitations still remain unconnected.
- Various activities under different schemes of Bureau of Energy Efficiency (BEE) and Ministry of Power (MoP) have resulted in saving in avoided power capacity of 11,000 MW.
- Works relating to 18 units for life extension aggregating to 1,931 MW and 69 units for repair and maintenance (R&M) aggregating to 17,435 MW have been completed during the Eleventh Plan.

Electricity Generation

14.24. The Eleventh Plan estimated a terminal year (2011–12) requirement of electricity generation from utilities at 1,038 billion units (BU), implying growth rate of 9.1 per cent (CAGR) per annum over the gross generation level of 670.65 BU in 2006–07 (the terminal year of the Tenth Plan). As against the above, the actual generation from utilities in 2011–12 was 876.88 BU, a shortfall of about 16 per cent, implying an annual growth rate of only 5.51 per cent for power from the utilities. The mode-wise and sector-wise energy generation for 2011–12 is given in Table 14.7. After allowing for captive generation of about 110 BU in 2011–12, the growth rate in total power generation is likely to be 5.7 per cent (CAGR) over the Eleventh Plan period, against the Plan target of 9.5 per cent. This has resulted in a demand–supply gap. On 31 March 2012, it was estimated that the peak deficit gap was 11.1 per cent and energy deficit

was 8.5 per cent. These deficits are lower than the corresponding deficits of 13.8 per cent and 9.6 per cent respectively at the end of the Tenth Plan, but there is a clear need to step up capacities and energy availability as the economy grows.

14.25. The actual cumulative capacity as on 31 March 2012 was 1,99,877 MW, including 24,503 MW of renewable sources of energy, the details of which are given in Table 14.8.

14.26. The Eleventh Plan has clearly succeeded in creating the precondition for achieving much larger addition to capacity in future. The performance of the private sector exceeded targets (see Table 14.6) whereas the Government sector fell short, with the shortfall being the generation in the Central sector. The share of the private sector in the total installed capacity has risen to about 42 per cent

TABLE 14.7
Mode-wise/Sector-wise Break-up of Generation

Type	(in Billion Units)			
	Central	State	Private	Total
Hydro (Incl. Bhutan Import)	55.97 (5.28)	71.02	8.81	135.80 (5.28)
Thermal	281.04	296.93	130.84	708.81
(a) Coal	225.18	271.98	87.63	584.79
(b) Lignite	18.76	2.88	6.45	28.09
(c) Gas	37.09	21.27	35.10	93.46
Nuclear	32.29	–	–	32.29
Total (Incl. Bhutan Import)	369.28 (5.28)	367.95	139.65	876.88 (5.28)

Source: CEA.

TABLE 14.8
All-India Cumulative Generating Capacity (as on 31 March 2012) (in MW)

	Hydro	Thermal	Nuclear	RES (MNRE)*	Total
Centre	9,085.40	45,817.23	4,780.00	0.00	59,682.63
State/UTs	27,380.00	55,024.93	–	3,513.72	85,918.65
Private	2,525.00	30,761.02	–	20,989.73	54,275.75
Total	38,990.40	1,31,603.18	4,780.00	24,503.45	1,99,877.03

* MNRE: Ministry of New and Renewable Energy.

Source: CEA.

of the incremental capacity in the Eleventh Plan. The capacity addition program has benefited from increase in the potential of the domestic equipment suppliers like Bharat Heavy Electricals Limited (BHEL), and also increased imports. BHEL has now the potential to deliver about 15,000–20,000 MW of new capacity per year as against 6,000 MW per year a few years ago. Further, more private-sector equipment manufacturers are also entering the market and the total capacity may increase to about 40,000 MW per year by 2016–17.

Ultra-Mega Power Projects

14.27. The Ultra Mega Power Projects (UMPPs) Programme, which brings in private investment into power generation, was a major initiative of the Eleventh Plan. So far power purchase agreements have been signed for four UMPPs of 4,000 MW each on the basis of competitive tariff-based bidding. They are based in Sasan (Madhya Pradesh), Mundra (Gujarat), Krishnapatnam (Andhra Pradesh) and Talaiya (Jharkhand). Out of these, one unit of 800 MW of Mundra by Tata Power has been commissioned in March 2012. 12 more supercritical UMPPs are being planned covering Chhattisgarh, Gujarat, Tamil Nadu, Andhra Pradesh, Odisha, Maharashtra and Karnataka. An important element of this programme is the induction of supercritical technology, which is an important shift towards energy efficiency. Unfortunately, some of these projects are plagued with uncertainties regarding fuel supply because they were based on imported coal and changes in government policies in the countries where the coal mines were located have raised the cost of coal whereas the power tariff is based on a competitive bid which does not contain a provision for passing on such increases.

Super Critical Projects under Construction

14.28. Thermal power stations based on present-day subcritical technology have efficiency of about 38 per cent. To improve energy efficiency further, it was decided that new thermal power plants should be based on supercritical technology. Already, eleven supercritical units with a total capacity of 7,400 MW have been installed. Large number of supercritical units are under construction and about 50 per cent

of coal-based capacity addition in the Twelfth Plan is expected to be based on supercritical technology. For the Thirteenth Plan, it has been decided that all coal-fired capacity addition shall be through supercritical units. Higher stream parameters of 565/593 degree centigrade are being adopted for supercritical units which would lead to design efficiency of over 40 per cent and lower CO₂ emissions by about 5 per cent as compared to a typical 500 MW subcritical unit.

14.29. Initiatives have been taken by the Government for developing indigenous capacity/capability for manufacturing of supercritical boilers and turbine generators as indigenous manufacturing capacity is considered vital to support large-scale induction of supercritical units envisaged. BHEL has entered into a technology collaboration with M/s Alstom and Siemens for supercritical technology for boilers and turbine generators respectively. BHEL has intimated that it had augmented its manufacturing capacity to 20,000 MW per year by March 2012. Further, setting up of joint ventures (JVs)/subsidiary companies by international manufacturers of supercritical boilers and turbine generators was encouraged. As a result, several JVs have come up in the country for setting up manufacturing facilities for supercritical boilers and turbines generators. Manufacturing capacities which may come up are indicated in Table 14.9. The Government of India has also approved the policy of encouraging domestic production of supercritical plants by bulk-tendering of such units. Two bulk orders—11 × 660 MW supercritical units for National Thermal Power Corporation (NTPC) and Damodar Valley Corporation (DVC) and 9 × 800 MW supercritical units for NTPC—were approved and being implemented.

Transmission

14.30. A programme for construction of 88,515 ckm transmission lines for evacuation of power from generating stations was envisaged at the beginning of the Eleventh Plan based on the target for capacity addition that was planned. When the capacity target was scaled down to 62,374 MW at the time of the Mid-Term Appraisal (MTA), the target for transmission was scaled down to 68,673 ckm. Details of

TABLE 14.9
Planned Manufacturing Capacity MW Per Annum

Joint Venture	Boilers	Turbine-Generators	Remarks
L&T-MHI	4,000 MW	4,000 MW	Production for boiler and turbine commenced
Alstom-Bharat Forge	–	5,000 MW	All manufacturing facilities for manufacture of turbines to be completed by June 2013
Toshiba-JSW		3,000 MW	All manufacturing facilities to be completed by April 2013
Gammon-Ansaldo	4,000 MW	–	Probable date of completion of facilities—December 2012 (2,000 MW) and December 2014 (additional 2,000 MW)
Thermax-Babcock and Wilcox	3,000 MW		All manufacturing facilities to be completed by September 2012
BGR-Hitachi Boilers Private Limited	5 Boilers per annum (~3,000 MW)		All manufacturing facilities to be completed by January 2013
BGR-Hitachi Turbine Generator Private Limited		5 Turbine Generators per annum (~3,000 MW)	All manufacturing facilities to be completed by July 2014
Doosan Chennai Works Private Limited	2,200 MW (Both subcritical and Supercritical)		DCW Pvt. Ltd. is 100 per cent subsidiary of Doosan Korea. Company incorporated in India on 20 July 2000 Existing facility—Chennai Additional facility acquired at Mannur village, Kancheepuram district Production from additional facilities to start by Sept-2012.

the achievement of transmission lines at the end of the Eleventh Plan are given in Table 14.10. The addition achieved during the Eleventh Plan is 69,926 ckm which is greater than the scaled-down target.

Distribution

14.31. Distribution is the weakest link in the power system with large losses leading to financial unviability. The cash losses of utilities selling power directly to consumers, after accounting for subsidy from the State Governments, increased from ₹17,620 crore in year 2007–08 to ₹42,415 crore in year 2009–10. The cumulative book losses (on accrual basis) of State Discoms have increased from ₹79,339 crore as on 31 March 2009 to ₹1,06,247 crore at the end of year 2009–10. The net worth of the Discoms has decreased from ₹31,972 crore to ₹14,786 crore as on 31 March 2010. While some of the States have shown improvements in the financial health of their utilities, others are yet to demonstrate the impact of the policy initiatives.

14.32. Distribution companies have not been able to recover the cost of supply through tariff, and the gap between Average Cost of Supply (ACS) and Average Revenue Realised (ARR) has widened and the same has been increasing over the years. This gap is partly a reflection of lower tariff, but it also reflects high aggregate technical and commercial (AT&C) losses which reduce the average revenue realised. The trends in AT&C for all States are shown in Table 14.11. The position is especially serious in the special category states, which have losses (2010–11, Provisional) varying between 29.17 per cent in the case of Uttarakhand to 74.30 per cent in Jammu & Kashmir. Himachal Pradesh with AT&C loss of 13.53 per cent is an exception. The non-special category states have generally performed better, though the losses are still unacceptably high in several of these, for example, Jharkhand (45.11 per cent), Bihar (49.99 per cent), Chhattisgarh (36.41 per cent), Uttar Pradesh (37.86 per cent), Odisha (44.35 per cent)

TABLE 14.10
Cumulative Achievement of Transmission Lines at the End of the Eleventh Plan

Transmission System Type/Voltage Class	Unit	At the End of the Tenth Plan (March 2007)	Addition during the Eleventh Plan	At the End of the Eleventh Plan (March 2012)
Transmission Lines				
765 kV	ckm	1,704	3,546	5,250
HVDC + 500 kV Bi-pole	ckm	5,872	3,560	9,432
400 kV	ckm	69,174	37,645	1,06,819
230/220 kV	ckm	1,10,805	25,175	1,35,980
Total	ckm	1,87,555	69,926	2,57,481
Substations				
765 kV	MVA	0	25,000	25,000
400 kV	MVA	92,942	58,085	1,51,027
230/220 kV	MVA	1,56,497	67,277	2,23,774
Total	MVA	2,49,439	1,50,362	3,99,801
HVDC				
Bi-pole link capacity	MW	5,000	1,750	6,750
Back-to-back capacity	MW	3,000	0	3,000
Total	MW	8,000	1,750	9,750

Source: CEA.

and Madhya Pradesh (41.10 per cent). In contrast, Andhra Pradesh, Gujarat, Punjab, Delhi and Tamil Nadu show relatively good performance in containing AT&C losses.

14.33. Due to unsustainable levels of AT&C losses and other inefficiencies in metering, billing and collection, the utilities are not able recover the cost of supply resulting in widening of gap between average cost of supply and tariff. Table 14.12 shows recent trends in financial parameters of major States.

14.34. The Comptroller and Auditor General (CAG) of India has carried out a study involving 24 utilities on issues impacting financial health of power distribution utilities in India and has pointed out the need for rationalisation of tariffs charged for various consumers. Unless the measures to contain these inefficiencies are taken, the Discoms will not be able to break even. Further, default in payments, non-metering of consumers, inadequate energy auditing, inadequate investments in upgradation of the distribution system are some of the other issues that need

to be addressed. This situation is a cause of serious concern and remedial steps need to be taken on priority basis in the Twelfth Plan to ensure that utilities generate adequate surpluses to support their ongoing projects.

Restructured Accelerated Power Development and Reform Programme (R-APDRP)

14.35. To address the problems of distribution losses, the Central Government had launched the APDRP scheme in 2002–03 as an Additional Central Assistance (ACA) scheme to finance the modernisation of sub-transmission and distribution networks with the objective to reduce AT&C losses to 15 per cent. This programme was not effective in reducing losses. A Re-structured APDRP was approved as a Central scheme in 2008 with a total outlay of ₹51,577 crore over the Eleventh Plan period. The focus of the programme is on actual, demonstrable performance in terms of AT&C loss reduction. The coverage of the programme is for the urban areas—towns and cities with a population of more than 30,000 (10,000 for

TABLE 14.11
Aggregate Technical and Commercial Losses of State Power Utilities (within State)

(in Percentage)					
S. No	State	2007-08 (Actual)	2008-09 (Actual)	2009-10 (Actual)	2010-11 (Provisional)
Special Category States					
1	Arunachal Pradesh	78.31	74.27	63.14	65.48
2	Assam	36.77	35.37	38.24	45.13
3	Himachal Pradesh	19.52	16.20	17.39	13.53
4	Jammu & Kashmir	73.43	70.69	72.03	74.30
5	Manipur	86.75	83.55	69.23	67.74
6	Meghalaya	39.74	35.27	43.19	37.93
7	Mizoram	38.38	46.43	42.89	42.08
8	Nagaland	51.20	55.85	58.02	55.98
9	Sikkim	46.87	46.81	51.37	46.81
10	Tripura	41.44	40.08	37.52	41.19
11	Uttarakhand	35.37	29.35	28.61	29.17
Non-Special Category States					
1	Andhra Pradesh	20.61	19.39	18.32	16.78
2	Bihar	47.60	41.66	42.39	49.99
3	Chhattisgarh	35.17	37.78	46.62	36.41
4	Goa	17.69	17.81	16.18	15.57
5	Gujarat	26.43	25.46	26.87	18.25
6	Haryana	29.01	28.43	29.50	26.72
7	Jharkhand	54.18	54.23	49.07	45.11
8	Karnataka	31.63	24.79	23.69	23.64
9	Kerala	44.80	34.98	28.81	29.72
10	Madhya Pradesh	46.64	45.78	42.93	41.10
11	Maharashtra	30.67	28.75	27.44	23.47
12	Orissa	41.68	42.20	39.71	44.35
13	Punjab	22.36	19.76	19.97	18.35
14	Rajasthan	40.18	32.99	33.06	25.60
15	Tamil Nadu	19.25	20.19	19.11	18.27
16	Uttar Pradesh	38.89	35.29	36.69	37.86
17	West Bengal	20.67	28.81	26.13	28.87
18	Delhi	34.58	17.92	20.78	15.76

special category States). Private distribution utilities are not covered under the programme which has been a point of criticism by some States. Projects under the R-APDRP scheme were to be taken up in two parts. Part A focused on establishing reliable and automated

system for sustained collection of accurate baseline data, and the adoption of IT in the areas of energy accounting and auditing and consumer-based services. Part B includes projects to strengthen the distribution system, including activities like automation

TABLE 14.12
Viability of Major State Utilities Not Improving
(Excluding Delhi and Odisha)

	2007-08 Actual	2008-09 Actual	2009-10 Provisional	2010-11 RE
Energy sold/energy available (%)	72.86	74.55	74.33	76.21
Revenue from sale of electricity (₹ crore)	1,31,220	1,48,605	1,63,475	1,92,827
Total cost of electricity sold (₹ crore)	1,74,452	2,12,292	2,35,701	2,61,467
Commercial losses without subsidy (₹ crore)	33,290	52,452	60,172	59,050
Average cost of supply (paise/kWh)	405.86	464.48	480.37	485.67
Average tariff (paise/kWh)	305.29	325.13	333.17	358.18
Gap between the cost of supply and tariff (paise)	100.57	139.35	147.20	127.49

Source: Power Utilities of various States and UTs.

and validation of baseline system, project evaluations, capacity-building and development of franchisees in the distribution sector and consumer attitude surveys. Projects under Part B would be taken up after the baseline data is established (Table 14.13).

14.36. The status of R-APDRP at the end of the Eleventh Plan is as follows:

- Under Part A of R-APDRP, 1,402 projects at an estimated cost of ₹5,196.50 crore have been approved for 29 States/UTs.
- Part A SCADA projects for 63 towns of 15 States have also been sanctioned at an estimated cost of ₹1,443.48 crore.
- Under Part-B of R-APDRP, 1,086 projects at an estimated cost of ₹24,776.17 crore have been approved for 20 States.

- All Part A projects have been awarded except in one State. These are under implementation and at a stage of advanced progress in several States.
- Part A of R-APDRP is to be completed by utilities in three years after its approval. Presently, there are no projects which have completed three years' time since they were sanctioned. However, it has been observed that State procurement policy and procedures have delayed the appointment of IT consultants in some of the States.

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)

14.37. RGGVY was launched by the Government of India in April 2005 as a comprehensive scheme for providing access of electricity to all rural households. The scheme involved electrification of all un-electrified villages plus a free connection for

TABLE 14.13
Details of Year-wise Progress Achieved on Restructured APDRP (as on 31 March 2012)

Year	Project Sanctioned			Budget Allocation			Actual Releases		
	Part A	Part B	Total	Loan	Grant	Total	Loan	Grant	Total
2008-09	1,947.70	0.00	1,947.70	0	1	1	0.00	350.00	350.00
2009-10	3,183.00	3,059.28	6,242.28	1,650	80	1,730	1,331.46	1.26	1,332.72
2010-11	715.40	12,915.31	13,630.71	3,600	100	3,700	2,246.42	100.00	2,346.42
2011-12	793.88	8,801.58	9,595.46	1,959	75	2,034	1,600.00	67.87	1,667.87
Total	6,639.98	24,776.17	31,416.15	7,209	256	7,465	5,177.88	519.13	5,697.01

Source: Ministry of Power.

TABLE 14.14
Status on RGGVY Progress during the Tenth and the Eleventh Plan

Year	Un-electrified Villages (No.)			BPL Households (lakh)		
	Target	Achieved	% Achieved	Target	Achieved	% Achieved
Tenth Plan						
2005-06	10,000	9,819	98.2	3	0.17	5.7
2006-07	40,000	28,706	71.8	40	6.55	16.4
Eleventh Plan						
2007-08	10,500	9,301	88.6	16	16.21	101.3
2008-09	19,000	12,056	63.5	35	30.85	61.7
2009-10	17,500	18,374	105.0	47	47.18	100.4
2010-11	17,500	18,306	104.6	47	58.84	125.1
2011-12	14,500	7,934	54.7	52	34.45	66.2
Cumulative (as on 31 March 2012)	1,12,795*	1,04,496	92.6	275*	194.25	70.6

* Revised coverage including Phase II projects.

Source: Ministry of Power.

BPL households. The scheme provided a subsidy of 90 per cent of the total project cost and balance 10 per cent of the project cost was to be provided by the Rural Electrification Corporation (REC) as loan. Initially, Phase I of the RGGVY scheme was approved for implementation with a capital subsidy of ₹5,000 crore during the remainder of the Tenth Plan period. Subsequently, the scheme was approved to be continued in the Eleventh Plan with a capital subsidy of ₹28,000 crore. As on 31 March 2012, out of the total of 1,12,795 villages to be covered under RGGVY (including Phase II projects), works in 1,04,496 villages have been completed and only 8,299 un-electrified villages remain; 6,000 villages are targeted to be electrified during 2012-13. In addition, about 10,000 remote villages are to be covered by the MNRE through non-conventional sources. Overall, by the end of Eleventh Plan, out of the total 5,93,732 villages in India (Census 2001), 5,56,633 villages (93.8 per cent) have been electrified as per CEA report. Some of the villages which have been electrified, that is, connected to the grid, have not yet been energised. The gap is primarily in the States of Bihar, Jharkhand, Odisha and Assam. Most of the projects are expected to be completed during 2012 except in the north-eastern region and in areas involving difficult terrain.

14.38. The year-wise targets and achievements for RGGVY during the Tenth and the Eleventh Five Year Plan are given in Table 14.14.

14.39. Studies were carried out to evaluate the socio-economic impact of electrification in Odisha. Other such studies are also underway. The key findings of the studies are:

1. Electrification has altered the household energy mix through substitution of traditional kerosene-based lighting source by electric light. This has resulted in energy and financial savings of households as families would no longer be subject to exorbitant price of kerosene.
2. Security within the villages as well as the quality of living of masses have improved.
3. Electrification has enhanced livelihood generation in the field of agriculture and related activities, small shops and other entrepreneurial activities.
4. Availability of electricity during post-sunset time allowed for extension of study hours for students.
5. Increased mobility and overall comfort, especially for women, have enhanced safe spaces and reduced the drudgery of household chores.

14.40. The RGGVY programme has several deficiencies in implementation. Firstly, nearly 6,000 villages electrified till December 2011 were still not energised due to lack of supporting network or other resources. Secondly, access to electricity in rural areas is still limited, especially in smaller hamlets. The traditional approach to policy and planning in power has assumed gender neutrality, thus failing to recognise that the needs of men and women can differ. Attention needs to be paid to livelihood activities of women and to their concerns of safety, security such as street lighting, healthcare, education and so on. Thirdly, poor financial health of utilities and high cost of power act as a disincentive for States to give new connections. Fourthly, some States do not have supporting network and are unable to provide energisation. Fifthly, a viable revenue model is yet to emerge. This has hindered larger access to new consumers.

14.41. Some of the other areas of concern are:

1. In certain States, even the minimum required hours of supply of six hours to eight hours could not be met.
2. There is a need to upgrade transformer capacity as the current average demand of BPL and above poverty line (APL) consumers is in the range of 300 to 500 watts and 0.5 to 1.15 KW, respectively. There have been several complaints of frequent burning of transformers.
3. The progress of release of APL connections is slow on account of poor supply of electricity, long delays in processing of applications and inadequate transformer capacity.
4. In many States, the distribution company takes a long time for issuing the first bill which can be anywhere between three to six months. Because of this delay, the total bill comes to around ₹1,000 to ₹1,500 which a rural household finds difficult to pay. This leads to a permanent high level of outstanding bills.
5. In most of the operating States, no franchisee was found in any of the surveyed villages and the Discoms had their own mechanism of meter reading, billing and so on.

6. As far as project preparation is concerned, it has been observed that in most cases, the detailed project reports (DPRs) were prepared in a hurried manner and quality was compromised.
7. As far as the socio-economic impact is concerned, it is found that electrification has so far not generated substantial employment opportunities or economic development in the rural areas except in a few cases.
8. The number of actual BPL families in the villages in many cases has been higher than the number indicated in the DPR.

Status on Open Access

14.42. The Electricity Act, 2003, mandates that non-discriminatory open access for interstate as well as intra-state transmission and distribution networks be provided by the utilities. Effective implementation of open access is crucial for opening up consumer choices as well as encouraging a healthy trading function in the country. The open access at interstate level is fully operational. Starting from 17 BUs of energy transacted through Short-Term Open Access (STOA) at the interstate level in 2004–05, the volume has grown to 55 BUs in 2010–11. While carriage and content separation at interstate level has been largely addressed by design, a point of concern has been the adequacy of carriage. Therefore, adequacy issues with respect to carriage need to be specified. Little progress has been made in the implementing of open access at intra-state transmission and distribution network level.

14.43. An inter-Ministerial Task was constituted under the chairmanship of Member (Energy), Planning Commission in February 2008 to examine the status and make recommendations on the measures for operationalising the provisions of the Electricity Act, 2003 in respect of open access. The Forum of Regulators (FoR) has issued model regulations for intra-state open access in September 2010. Adoption of these model regulations by State Electricity Regulatory Commissions (SERCs) would go a long way in successful implementations of intra-state open access. Further, a Second Task Force was constituted in February, 2010 to review the progress made on the recommendations of the previous

Task Force and suggest further course of action on the issues upon which there was no consensus in the First Task Force. The report of the second task force has been received and States have been asked to take necessary action to implement the recommendations. Recommendations of the Task forces on open access are given in Box 14.2.

14.44. At the State level, Discoms need to create distribution control centres and empower them so that open access at the distribution level becomes a reality. The request for open access is given at the State level to the State distribution control centres. If these can be empowered to take a quick decision in accordance with the prescribed guidelines and norms for providing open access, the decisions will not be delayed.

Such an empowerment of the State distribution centres, therefore, is important for the open access.

Financial Performance

14.45. The approved Eleventh Plan power sector budgetary outlay for the public sector (Central and State sectors) was ₹5,72,648 crore which was 15.71 per cent of the total Plan outlay. Summary of the year-wise investment made during the Eleventh Plan is shown in Table 14.15.

14.46. The Table indicates major shortfalls in case of central power sectors. This is primarily because the pace of capacity addition of NTPC and National Hydroelectric Power Corporation (NHPC) has been lower than the expected. The internal and

Box 14.2 Recommendations of Task Force on Open Access

REGULATORY AND SYSTEM CHANGES

1. SERCs to regulate the tariffs of all consumers of 1 MW and above in accordance with the provisions of Sections 42, 49 and 86 of the Act and fix only the wheeling charges (in conformity with section 42, read with section 62 of the Act) and open access surcharge.
2. Tariff to be charged by the discoms for providing standby supply should not exceed the maximum UI rate for the applicable hours plus a 5 per cent administrative charge thereon or alternatively, the bulk consumers may directly handle the UI supplies with the respective State Load Dispatch Centres (SLDCs) and to act as independent entities with financial and operational autonomy.
3. SLDCs should be upgraded in a time bound manner to enable open access, under section 42.
4. SERCs should ensure enabling arrangements such as metering and settlement.
5. Regulators should meet bulk consumers to take proactive action for encouraging open access. Timelines should be provided for the same.
6. The trading margin fixed by the Central Electricity Regulatory Commission (CERC) should apply in a seamless manner in any one transaction emanating from a generating company and terminating with a discom through multiple traders and should not exceed the maximum margin allowed to a single trader.

CENTRAL GOVERNMENT

7. To earmark a specified proportion, say, 25 per cent of the Centre's discretionary allocation of 15 per cent of central public sector undertakings' (CPSUs') generating capacity which may be made available for direct sale by CPSUs to open access consumers. As for new and upcoming capacity of CPSUs, 75 per cent of the discretionary quota may be reserved for sale to open access consumers and the sale price should determine by bidding. 75 per cent of the profits made by the CPSUs on this account may be transferred to the respective states where open access consumers are located.
8. Scheme of UI charges should be reviewed to ensure that UI does not become a vehicle for gaming in scheduling. For this a mechanism should be evolved to facilitate corrective measures against gaming including stiff penalties.
9. Commencing from the Twelfth Five Year Plan, the Central Government should release Accelerated Power Development and Reforms Programme (APDRP) assistance only to States that comply with the above and enable consumers to exercise their statutory right to open access. A package of incentives and disincentives should also be formulated by Power Finance Corporation (PFC) and REC for States to operationalise open access.

TABLE 14.15
Outlay/Expenditure: Centre, States and UTs (₹ Crore)

Sector	Eleventh Plan Approved Outlay	2007–08 (Actual)	2008–09 (Actual)	2009–10 (Actual)	2010–11 (RE)	2011–12 (RE)	Eleventh Plan Likely Expenditure	Per cent Utilisation
States and UTs	2,25,385	27,243	31,577	34,059	43,749	48,068	1,84,696	81.95
Central Sector	3,47,263	29,596	42,242	44,528	46,746	70,390	2,33,501	67.24
All India	5,72,648	56,839	73,819	78,587	90,495	1,18,458	4,18,197	73.03

Source: Planning Commission.

extra budgetary resource (IEBR) of the power sector CPSUs was 63 per cent of the original Plan targets.

TWELFTH PLAN PROGRAMME

Addition to Generation Capacity

14.47. The Working Group on Power has estimated a capacity addition requirement of 75,785 MW corresponding to 9 per cent GDP growth during the Twelfth Plan period. However, in order to bridge the gap between peak demand and peak deficit, and provide for faster retirement of the old energy-inefficient plants, the target for the Twelfth Plan has been fixed at 88,537 MW. As shown in Table 14.16, the share of the private sector in the additional capacity will be 53 per cent, compared to a target of 19 per cent in the Eleventh Plan. Since the growth rate of GDP for the Twelfth Plan is likely to be 8.2 per cent and not 9 per cent, the target for capacity addition contain an element of slack of about 10 per cent.

14.48. The share of power based on non-fossil fuel plants is very low at present and should be

increased over time to promote low carbon growth strategy. The share of coal and lignite in the additional capacity being created during the Twelfth Plan is 79 per cent, up from 76 per cent in the target from the Eleventh Plan which actually ended up at 79 per cent. The projected capacity addition in non-fossil fuel plants covers addition of hydro capacity of 1,0897 MW and nuclear capacity of 5,300 MW. Besides this, 1,200 MW import of hydro power from Bhutan has also been considered. In addition, it is planned to add a grid interactive renewable capacity addition of about 30,000 MW comprising of 15,000 MW wind, 10,000 MW solar, 2,100 small hydro, and the balance primarily from bio mass planned. Details of the projected Twelfth Plan capacity addition, sector-wise and mode-wise, are given in Table 14.16.

Power Generation

14.49. The Working Group for the Twelfth Plan has estimated a requirement of 1,403 BU by the year 2016–17, after taking into account energy conservation measures and demand–supply management.

TABLE 14.16
Sector-wise and Mode-wise Capacity Addition (Provisional) during the Twelfth Plan (MW)

Sector	Hydro	Total Thermal	Thermal Breakup			Nuclear	Total
			Coal	Lignite	Gas/Lng*		
Central	6,004	14,878	13,800	250	827.6	5,300	26,181.6
State	1,608	13,922	12,210	0	1,712.0	0	15,530.0
Private	3,285	43,540	43,270	270	0.0	0	46,825.0
Total (Excluding RES)	10,897	72,340	69,280	520	2,539.6	5,300	88,536.6
Renewables	–	–	–	–	–	–	30,000
Total (Including RES)	10,897	72,340	69,280	520	2,539.6	5,300	1,18,536.6

* Addition of gas capacity is provisional and will depend upon the availability of gas. This will be reviewed during the MTA.

Without such measures, the generation requirement is projected at 1,463 BU. Even if the moderate level of 1,403 BU is taken as the Twelfth Plan target, the projected growth rate in power generation will be 9.8 per cent.

14.50. The projected change in the mix of generation by fuel supply by the end of 2030 is given in Table 14.17. The share of renewables in electricity generated is expected to rise from around 6 per cent in 2012 to 9 per cent in 2017 and 16 per cent in 2030. However, the share of hydro electricity is expected to fall from 15 per cent in 2012 to 11 per cent in 2030. The share of nuclear power, another clean source from a carbon emission perspective is expected to rise from 3 per cent in 2012 to 5 per cent in 2017 and to 12 per cent in 2030. Taking all these clean energy sources together, the share of hydro, renewables plus nuclear energy is expected to rise from 26 per cent in 2012 to 39 per cent by 2030.

Renovation and Modernisation and Life Extension of Thermal Power Plants (R&M and LE)

14.51. Coal-based thermal plants are the backbone of the Indian power sector. Most of the old and smaller size non-reheat type units are on the verge of retirement. R&M and LE is an economical option to supplement the capacity addition programme which was initiated in 1984 as a Centrally Sponsored Programme during the Seventh Plan. It continued till the Eleventh Plan and CEA has recommended for its continuance during the Twelfth Plan also.

R&M of Hydro Plants

14.52. The normal life expectancy of hydro plants is about 30–35 years after which they need life extension. Many of the existing hydro power stations could be modernised to generate reliable and higher yield by restoration and modernisation schemes. These involve adopting modern equipments like static excitation, microprocessor-based controls, electric microprocessor, high speed static or numerical relays, data logger, optical instrumentation for monitoring vibrations, air gaps, and silt contained in water and so on. These measures would improve availability of hydro power stations and minimise outages. Routine maintenance activities are not included in these schemes. Only activities which aim at increasing the efficiency of the unit and improve availability or steps required to meet environmental norms, or aimed at renovating obsolete equipment controls and instrumentation, are included in R&M scheme.

Exploitation of Hydro Electric Potential

14.53. Hydro power plants, particularly storage-based, are generally planned for their ability to meet peak power demand. Estimated hydro potential in India is about 149 GW including the plants of less than 25 MW capacity. The total capacity developed and under development put together so far is about 32 per cent of this potential. A major part of the unexploited potential is in North-East and Himalayan regions. With the deployment of latest technologies we can harness the remaining potential without damaging the ecology. Table 14.18 shows

TABLE 14.17
Changing Structure of Fuel for Electricity

		Capacity (%)			Generation (%)		
		2012	2017	2030	2012	2017	2030
1.	Coal	56	57	42	70	69	58
2.	Oil	1	1	0	0	0	0
3.	Gas	9	6	3	7	5	3
4.	Hydro	20	15	13	14	12	11
5.	Renewables	12	17	33	6	9	16
6.	Nuclear	2	4	9	3	5	12
	Total Clean Energy (4 + 5 + 6)				23	26	39

TABLE 14.18
Status of Hydro Electric Potential Development

(In terms of Installed capacity—above 25 MW)

Region	Total potential	Capacity developed	Capacity Under development	Total Developed+ Under development (%)	Capacity yet to be developed (%)
Northern	52,263	15,479	5,416	20,895 (40)	31,368 (60)
Western	8,131	5,552	400	5,952 (73)	2,179 (27)
Southern	15,890	9,367	570	9,937 (62.5)	5,953 (37.5)
Eastern	10,680	2,908	2,713	5,621 (52.6)	5,059 (47.4)
North Eastern	58,356	1,200	2,852	4,052 (7)	54,304 (93)
All India	1,45,320	34,506	11,951	46,457 (32)	98,863 (68)

the status of hydro potential development in the country (above 25 MW).

Peaking Power and Reserve Plants

14.54. The generation system must be designed to meet base load as well as peak load of the power system and have the ability to respond dynamically and efficiently to variations in demand within a short time. Since our system has wide variation in demand during peak and off-peak periods there is a need for peaking support with very high ramping rate. Peaking power can be provided by reservoir-based hydro plants or gas-based generation. Apart from the above, an optimal power system should have adequate reserves to meet the contingency of outage of certain operating generation capacity. It is important to set up these capacities to meet peaking power demand. It will be necessary to start up 2,000 MW of peaking gas-based plants, despite the limitations on availability of gas improvement.

14.55. Since it is expensive to carry unutilised capacity, and power from gas is likely to be especially expensive, the ability to meet peak loads is critically dependent on introducing time of day metering with a sufficient difference between peak and off-peak tariffs.

Pollution and Ash Utilisation

14.56. An important positive development in the power sector is that the utilisation of ash has increased impressively from 9.63 per cent in 1996–97 to 56 per cent in 2010–11. This is the consequence of deliberative planning to reduce adverse environmental impact as the coal-based capacity expanded. There are 13 thermal power stations in the country which have achieved 100 per cent or more ash utilisation during the year 2010–11. The ash generation by coal/lignite-based thermal power stations is estimated to increase to 170 million tons per year by the end of 2010–11 and reach to a level of about 300 million tonnes per year by the end of the Twelfth Plan. The Ministry of Environment and Forests (MoEF) has issued notifications for achieving 100 per cent utilisation of fly ash. The quantity of fly ash which has to be disposed off in ash ponds shall be reduced significantly which will help in addressing problems of pollution. All project developers will have to meet the stringent requirement of environmental norms for setting up thermal power plants to minimise air and water pollution.

Captive Power Plants

14.57. A number of captive power plants (CPPs), including coal-based power plants of varied type

and size, exist in the country. These are either used in process industries or for in-house power consumption for large units. Capacity addition of around 13,000 MW of captive power is likely to be commissioned during the Twelfth Plan. Surplus power, if any, from CPPs is fed into the grid. The tariff for the surplus power is regulated. The captive power capacity generators find it profitable to supply electricity to the grid as the fixed cost has already been recovered by them from the power supplied for their captive use. The variable costs plus additional margins which is provided by the utility is found attractive by them for supplying power surplus to their use.

14.58. The installed capacity of CPPs has increased from 22,335 MW at the beginning of the Eleventh Plan to 36,511 MW (provisional) in March 2012, adding a total of around 14,000 MW addition of captive capacity during the Plan period.

Fuel Supply Problems

14.59. Although the pace of creation of generation capacity has picked up considerably, the fuel supply capability has not kept pace and serious fuel supply problems have arisen in the last year of the Eleventh Plan. Since 80 per cent of the additional generating capacity will be coal-based, resolution of coal supply to the power plants coming on stream will be crucial. With 50 per cent of the new capacity being created in the private sector fuel supply agreements have to be legally binding with credible penalties to reassure bankers and other financiers financing the establishment of capacity. The problems of coal supply are discussed in coal sector.

14.60. Availability of gas is also a problem as gas has yet to be ensured for 5,156 MW of gas-based projects commissioned during the Eleventh Plan period which are currently stranded/operating at a very low plant load factor (PLF) due to non-supply of gas. In addition to these projects, at least 2,538 MW of additional gas based capacity is expected to come up during the Twelfth Plan and as mentioned above, there is need for 2,000 MW of gas-based capacity to deal with peaking requirements. The requirement for coal, lignite and gas/LNG for power sector at the end of the

TABLE 14.19
Fuel Requirement during 2016–17

Fuel	Requirement	Availability
Coal	730 Million Tonnes	550 Million Tonnes
Lignite	46 Million Tonnes	46 Million Tonnes
Gas/LNG	207 MMSCMD*	102 MMSCMD*

Source: Planning Commission estimates based on Working Group Reports on Power and Petroleum and Natural Gas.

*In addition, about 17,500 MW gas-based capacity is under various stages of construction for which additional gas requirement is about 84 MMSCMD.

Twelfth Plan period has been shown in Table 14.19. Clearly domestic supply of both coal and gas needs to be augmented by imports. Since imports will be at much higher prices, some method must be found to make the higher priced fuel acceptable to generators. If domestic prices cannot be fully aligned with import prices, some resort to price pooling will be necessary and the scope for such price pooling must be urgently explored.

Expansion in Transmission System and Capacity

14.61. The large expansion in production and consumption of electricity has to be supported by a significant expansion and strengthening of the transmission network. Technological developments for transmission lines of 765 KV and 1,000–1,200 KV are of great relevance to reduce land requirement and transmission losses. Greater reliance will have to be placed on gas insulated substations which need about 20 per cent of the space required for conventional stations. This is an area where public investment can be supplemented by private investment and a good start has been made in the Eleventh Plan. It is important to build a policy framework within which more private sector investments will be forthcoming in the Twelfth Plan. A policy framework for public–private partnership (PPP) and a standardised documentation is being prepared for use by the States.

14.62. A total of about 1,07,440 ckm of transmission lines; 2,70,000 MVA of AC transformer capacity and 12,750 MW of HVDC systems are estimated as needed during the Twelfth Plan. Table 14.20 gives

TABLE 14.20
Transmission Line at the End of the Twelfth Plan Period

Transmission System Type/ Voltage Class	Unit	At the end of Eleventh Plan	Expected addition during Twelfth Plan	Expected by end of Twelfth Plan
Transmission Line				
HVDC Bipole lines	ckm	9,432	7,440	16,872
765 kV	ckm	5,250	27,000	32,250
400 kV	ckm	1,06,819	38,000	1,44,819
220 kV	ckm	1,35,980	35,000	1,70,980
Total	ckm	2,57,481	1,07,440	3,64,921
Sub-Station				
765 kV	MVA	2,5000	1,49,000	1,74,000
400 kV	MVA	1,51,027	45,000	1,96,027
230/220 kV	MVA	2,23,774	76,000	2,99,774
Total	MVA	3,99,801	2,70,000	6,69,801
HVDC				
Bi-pole link capacity	MW	6,750	12,750	19,500
Back-to-back capacity	MW	3,000	0	3,000
Total	MW	9,750	12,750	22,500

the transmission programme to be taken up during the Twelfth Plan period and also gives the anticipated cumulative achievement at the end the year 2016–17.

Creation of a National Grid

14.63. The power system in the country is demarcated into five regions. Four regional grids have been operating in synchronous mode as a single system for the past few years. Only the southern grid is yet to be connected to the rest of the system. The high voltage link to connect southern grid is under construction and likely to be completed by January 2014. Once this is achieved, all the five regional grids will operate as a single system in synchronous mode. This will be the largest single such system in the world, both in terms of the grid size and system capacity of around 2,00,000 MW, though, at a given point of time, actual power flow may be lower than this level.

14.64. The capacity for transfer of power across regions at the end of the Eleventh Plan is shown in Table 14.21. The total capacity to transfer power which is currently about 27,750 MW and this is

expected to increase by 136 per cent to 65,550 MW by the end of Twelfth Plan. The specific line which is under construction for connecting the southern region is the Raichur–Sholapur 765 KV line. In fact, these are two single circuit lines and the total transmission capacity of these two lines would be about 4,200 MW. Three HVDC systems and a number of 765 KV lines and substations shall be implemented during Twelfth Plan. The Aurangabad–Wardha 400 KV QUAD DC, line which is part of the transmission system for evacuation of power from Mundra Ultra Mega Power Project (UMPP) has been planned and designed in such a way that the lines would be converted into a 1,200 KV S/C lines by a later date.

14.65. There is a three-tier structure for load dispatch, namely, State Load Dispatch Centre, Regional Load Dispatch Centre and the National Load Dispatch Centre. The Government of India notified Power System Operation Corporation Limited (POSOCO) as the designated entity to operate RLDC/NLDC with effect from 1 October 2010. A Forum of Load Dispatchers (FOLD) has been

TABLE 14.21
Inter-Regional Flow of Power at the End of Twelfth Plan Period

Region	End of Eleventh Plan	End of Twelfth Plan (Tentative)
Eastern/Southern	3,630	3,630
Eastern/Northern	12,130	17,930
Eastern/Western	4,390	12,790
Eastern/North Eastern	1,260	2,860
Northern/Western	4,220	14,420
Western/Southern	1,520	7,920
132/110 KV Lines	600	-
North Eastern/Eastern-Northern/Western	-	6,000
Total	27,750	65,550

constituted as approved by the Forum of Regulators (FOR) in January 2009 for harmonising practices across different load dispatch centres.

Evacuation of Power from the North-East

14.66. The North-East has very large potential for producing hydro power—close to 50,000 MW—but the pace of implementation has been poor. The evacuation of power from the North-East poses a major challenge for several reasons. First, the entire capacity has to be evacuated through a narrow strip of about 25 km in West Bengal. Although no forest clearance is needed, land acquisition issues could pose problems, which need to be tackled. Second, the number of hydro power plants coming up in the region, especially in Arunachal Pradesh, is expected to be spread over the Twelfth and Thirteenth Plans but the transmission system has to be devised as a onetime operation and may therefore have redundancy initially. This will increase the costs of transmission. Thirdly, a number of States including Arunachal Pradesh, Tripura and Manipur do not have adequate 132/220/400 KV systems and this may cause problems in evacuation of power. Fourthly, the distribution system is inadequate and consequently leads to large power losses.

14.67. The road map for the development of power sector, strengthening of overall transmission system and sub-transmission system of North-East Region (NER) and Sikkim was brought out in Pasighat Summit of North Eastern Council on 17 January

2007. As a follow-up to the recommendations of the summit, a subgroup under the chairmanship of Member (Power Systems), CEA was constituted to suggest the road map for strengthening the transmission system in the region. Subsequently a comprehensive review was taken at the Member (Energy), Planning Commission level to find out the modalities and source of funding to realise the objective.

14.68. Based on the recommendation of CEA and in consultation with each State of NER and Sikkim, Power Grid has prepared detailed project reports for comprehensive schemes for strengthening of transmission, sub-transmission and distribution system in each state of NER and Sikkim and also for interstate transmission system in NER in June 2010. The estimated cost of the above schemes is about ₹11,348.50 crore. The schemes were to be implemented in two phases by 2015–16. Considering the strategic importance of Arunachal Pradesh and Sikkim, a separate scheme for strengthening of transmission system for these two has been formulated at an estimated cost of about ₹3,014 crore. The Planning Commission has conveyed its in-principle approval to this scheme recently. Funding for this project will be provided jointly by the Ministry of Development of North Eastern Region (DoNER) and from the Non-Lapsable Central Pool of Resources (NLCPR). For the strengthening of transmission systems in the remaining six states, Ministry of Power is exploring the possibility of tying up funds from the World Bank.

14.69. Integration of Indian electricity grid with countries such as Bhutan and Nepal would result in optimisation of electricity resources on a large scale and provision of additional benefits and opportunities to the selling and buying countries. This will enhance hydro-thermal mix in generation, and reduce carbon emission and dependence on fossil fuels. An electric grid interconnection between India and Bangladesh through a Berhampur (India)–Bheramara (Bangladesh) 400 KV DC, 125 km line along with 1×500 MW HVDC back to back asynchronous link at Bheramara is being developed for facilitating exchange of power up to 500 MW between the two countries. The capacity of this interconnection can be upgraded in future. The asynchronous link ensures that any fluctuations or disturbances on one side would not affect the other side.

Challenges in Transmission Sector

14.70. The proposed rapid expansion of the capacity to transfer capacity poses some serious challenges, viz. right of way, flexibility in line loading and regulation of power and improvement of operational efficiency. Following measures may be implemented to meet the above challenges:

- Upgradation of transmission lines
- High capacity 400 KV multi, circuit/bundle conductor line
- High Surge Impedance Loading(HSIL) line
- Compact towers
- Increase in current: High Temperature Low Sag (HTLS)
- Reduction in land for substation
- Regulation in power flow/FACATS devices
- Improvement of operational efficiency with condition based monitoring and private maintenance
- Development of 1,200 KV AC system
- Creating adequate evacuation and transmission facilities for renewable power including construction/strengthening of interstate transmission.

The Distribution System

14.71. The distribution segment plays a crucial role in the overall functioning of the power sector because it is the part of the system which generates the revenues needed to pay generation and transmission

utilities. The viability of the power sector as a whole is therefore critically dependent on the health of the distribution sector. Unfortunately, as the Eleventh Plan experience amply demonstrates, the financial viability of the system is under severe strain. Poor financial health of utilities has resulted in underinvestment in the distribution network causing poor upkeep and maintenance. Consequently the quality of supply is hampered, leading to customer dissatisfaction and poor recovery. This, in turn, leads to further deterioration of financial health of utilities. This vicious cycle needs to be broken.

14.72. It is absolutely vital that the distribution system is made financially viable during the Twelfth Plan. The key focus of the Twelfth Plan must be to strengthen the performance of the distribution system to achieve improved financial viability of Discoms and to expand access to power in rural areas. This calls for concerted attempts at AT&C loss reduction, introduction of smart grid to allow effective demand side management (DSM), greater private sector participation to achieve management efficiency and so on. Since distribution is entirely the domain of States, the responsibility for improving distribution lies almost entirely with State Governments. The Central Government can incentivise action in a manner which allows the States leeway for experimenting with different ways of obtaining better results.

14.73. The Government had constituted the Shunglu Committee in July 2010 to study issues relating to the financial viability of the Ds and give recommendations on how to improve the situation. The Committee has since given its recommendations. In order to examine these recommendations, and suggest a strategy for the turnaround of the distribution sector in the Twelfth Plan, an Expert Group under the chairmanship of Member (Energy), Planning Commission was set up to look into the problems being faced by the State Discoms.

Debt Restructuring Policy

14.74. The Expert Group gave extensive recommendations for improving the financial health of the discoms during the Twelfth Plan. Based on the

recommendations of the Expert Group, the Cabinet has approved a debt restructuring plan which can be summarised as follows:

1. a. 50 per cent of the outstanding short term liabilities (STL) as of 31 March 2012 to be taken over by State Governments by way of bonds to participating lenders shall be first converted into bonds to be issued by Discoms duly backed by the State Government guarantee. The State Government will take over the liability during the next two to five years by issuance of special securities in favour of participating lenders in a phased manner keeping in view the fiscal space available till the entire loan (50 per cent of STL) is taken over by the State Government.
- b. The State Government would provide full support to the Discoms for repayment of interest and principal.
2. Balance 50 per cent of the STL will be rescheduled by lenders and serviced by the Discoms with a moratorium of three years on principal and would be backed by a State Government guarantee. The best possible terms are to be extended for the rescheduled loans to improve viability of Discoms' operations.
3. The restructuring/reschedulement of loan is to be accompanied by concrete and measurable action by the Discoms/States to improve the operational performance of the distribution utilities. In order to make the effort meaningful, the State Government/Discoms have to commit themselves and carry out certain mandatory and recommendatory conditions contained in part (c) of the Scheme.
4. To set up a Transitional Finance Mechanism in support of the restructuring effort of the State Government for their distribution utilities having the following features:
 - a. For providing liquidity support by way of a grant equal to the value of the additional energy saved by way of accelerated AT&C loss reduction beyond the loss trajectory specified under Restructured Accelerated Power Development and Reform Programme (RAPDRP).
 - b. The eligibility of grant would arise only if the gap between ARR and ACS for the year has been reduced by at least 25 per cent during the year judged against the benchmark for the year 2010–11.
 - c. This scheme would be available only for three years beginning 2012–13.
 - d. Incentive by way of capital reimbursement support of 25 per cent of principal repayment by the State Government on the liability taken over by the State Government under the scheme. The amount to be reimbursed only in case the State Government takes over the entire 50 per cent of the short-term liabilities corresponding to the accumulated losses outstanding as on 31 March 2012. Detailed guidelines for the Transitional Finance Mechanism as outlined above would be worked out by the Ministry of Power in consultation with Ministry of Finance.
5. The Scheme would be applicable to all State Discoms having accumulated losses and facing difficulties in financing operational losses.
6. For removal of difficulties in interpreting or implementing the Scheme, Ministry of Power may be authorised to issue clarification, after inter-ministerial consultations, wherever required, with the approval of the competent authority.

14.75. Effective implementation of the restructuring package during the Twelfth Plan would send a powerful signal that the power sector is on the path of financial viability.

Restructured APDRP

14.76. The challenge of providing power to all involves considerable investment in distribution. The Working Group for the Twelfth Plan has assessed a total investment requirement for the distribution sector at ₹3.06 lakh crore. Some of the key initiatives proposed during the Twelfth Plan are:

1. The population norms under R-APDRP for including a city under R-APDRP may be relaxed

by lowering the existing population threshold. More extensive coverage will bring uniformity in billing and customer service of the utility across all its service areas. R-APDRP may also cover assistance to private distribution companies.

2. A National Electricity Fund (NEF) had been set up. This will now be operationalised. It will provide interest relief to the distribution utilities to cover loans taken from financial institutions for development of the distribution sector.
3. Utilities and regulators shall make an action plan to eliminate the gap between the average cost of supply and average tariff realised through improved tariff implementation and adoption of multi-year tariff framework.
4. Time of Day (TOD) metering shall be taken up by all the utilities for effective demand side management (DSM).
5. Load shifting arrangement by regulators and improvement in energy efficiency and its measurement by BEE in the agriculture sector shall contribute towards DSM and ease out the pressure on utilities.
6. Open Access shall be provided to consumers with more than 1 MW load in accordance with the Electricity Act, 2003. This was mandatory with effect from 1 January 1 2009 but it has not been operationalised due to reluctance of State Governments and the utilities to give the necessary freedom to large customers to choose their own sources of supply. In fact, under the law, the State electricity regulator should not set tariffs for large customers leaving them to be determined through negotiations.
7. To improve safety, counter theft and improve aesthetics, underground cabling work shall be taken up by the utilities for towns under R-APDRP in selected areas.
8. Moving towards a smart grid in a manner relevant to our needs will be a key focus area in the distribution sector in the Twelfth Plan. A number of pilot projects will be taken up.
9. Phased installation of smart metres, extending SCADA system to 100 more towns, and integration of renewable into the grid.

The Role of Private Investment and Participation in Distribution

14.77. The experience of privatisation in Delhi, Kolkata, Mumbai, Ahmedabad, and Surat shows that transmission and distribution losses can be reduced, network efficiency increased, and service levels improved. The experiences in Bhiwandi, Maharashtra of franchising have also indicated positive gains with network losses going down from 63 per cent to 19 per cent in Bhiwandi and service levels improving. The Franchise model is now being expanded to Nagpur, Aurangabad, Jalgaon in Maharashtra and Agra in Uttar Pradesh. An alternative model is public-private partnership (PPP) in the distribution segment for which necessary concession agreements are being designed. The Twelfth Plan will have to place a major emphasis on expansion of Franchise or PPP or privatisation in different utilities as a strategy to reduce network losses and improve efficiency of service and consumer satisfaction.

Separation of Rural Feeders

14.78. An important initiative to improve the availability of power in the rural areas and have more effective management of power for the agriculture sectors where the requirements may be for limited hours, has been to separate rural feeders for lighting and agriculture loads. This was initiated by Gujarat utilities and has subsequently been taken up by Rajasthan, Andhra Pradesh, Haryana, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Karnataka, Maharashtra and a number of other States. A World Bank study on the efficacy of these reforms is underway. According to the initial indications, the benefits have been found to be more in the field of improved lighting in the villages with varying degree of success on reducing T&D losses.

Universal Electrification

14.79. The RGGVY was started with an aim to provide electricity connections to all villages and free connections to BPL families (Annexure 14.1). It has certainly provided increased access of power to a large number of households as indicated in paragraph 3.1.8. Clearly, there is still a large population which is not using electricity either because of lack of network in the villages or absence of connectivity to

the household. There are also a large number of habitations left uncovered. To provide power to all during the Twelfth Plan would require dealing with the large backlog in the States of Uttar Pradesh, Bihar, Odisha, Assam and some of the North Eastern States.

14.80. Connectivity by itself is only a part of the programme. In many States there is also a real shortage of power. Besides, RGGVY focuses only on household supply and does not address the needs for providing electricity for small industries and agriculture, which need three-phase supply. This, in turn, requires strengthening of the rural network and not just the last mile connectivity to households, which is what RGGVY covers. States are often unable to invest in this. For effective universal access, the RGGVY programme will be restructured.

Human Resource Development and Capacity Building

14.81. The present power scenario demands a very comprehensive and pragmatic approach to attract, use, develop and conserve valuable human resources. Technically trained work force comprising of skilled engineers, supervisors, artisans, managers and so on are required in every sphere of the power supply industry. A growing concern over environmental degradation and depletion of the conventional energy sources has made the task of electricity generation even more challenging and therefore, quality standards of the staff are becoming increasingly vital.

14.82. For a capacity addition of about 1,00,000 MW (including renewables) in the Twelfth Plan, the additional work force requirement shall be of the order of 4 lakh out of which nearly 3 lakh will be technical. Therefore, all Central sector utilities, State sector utilities, and IPPs would need to create required training infrastructure for providing O&M training. Additional training infrastructure shall be created by organisations like NPTI and training institutes of other utilities. These should augment their existing training institutes for meeting the increased training requirement of the power sector.

R&D in Power Sector

14.83. The power sector being highly technology-intensive, R&D plays a major role in its

developmental plans. In the present scenario, R&D initiatives are particularly required in four different conventional sectors, viz. generation, transmission, distribution and environment.

14.84. Thermal, hydro, renewable energy and distributed generation are the key areas in the generation sector. Design and development of the equipment, real-time simulators and controllers, creation of data bank, automation pilot plant demonstration, development of alternative materials, equipment performance, biological efforts and exploratory studies are required in the transmission sector. R&D initiatives in smart grid and distributed generation are required for improvement of distribution sector. Major PSUs involved should be encouraged to do the necessary R&D. Further clean development mechanism for bulk utilisation of fly ash, control of SO_x, NO_x and mercury in coal-based thermal power plants need immediate attention for clean and green energy.

14.85. R&D in distribution and rural electrification needs more thrust. The key research areas may be AC/DC micro-grid demonstration for improving reliability and power quality, energy storage scheme for improving the reliability of sensitive loads, development of intra-operable standards and protocol for energy metering, load research, I.T. applications in distribution and smart grid and so on. R&D initiatives are also required for enhancing material strength and durability and for standardisation on their specifications. A key initiative for R&D in the Twelfth Plan may include setting up of a technical cell in CEA, which will focus on best practices, R&D in data collection and specific projects and technical support to States for consultancy and implementation. The research projects will include support to universities.

Project Implementation

14.86. Land is increasingly becoming a scarce resource and availability of land is posing a serious challenge for future power plants. The optimum utilisation of land is therefore crucial. Design changes are required to reduce land requirement. Similarly, availability of water has become scarce. To meet future water demand of thermal power, technical

measures for reducing water consumption, creation of large reservoirs/dams of potential rivers to retain flood water and encouraging coastal power plants will be undertaken.

14.87. Achievement of the generation capacity targets depends critically on supporting infrastructure in different transport sectors like railway, highways and roads, inland waterways and gas pipelines. Railways need to enhance their capacity for coal evacuation from coal fields by expanding proposed dedicated freight corridors and also ensure rail connectivity to all ports having coal unloading facilities. Roads and highways need to be augmented for transportation of over dimensional consignments and changes in Motor Vehicle Act may be required to accommodate consignments, with safeguards, of above 49 million tonnes and also include hydraulic axle trailers. Accordingly, load classification for roads and bridges may be reviewed and toll plaza building on highways may be designed keeping these requirements in view.

14.88. Coal handling arrangements at ports must be expanded to handle the larger quantities of imported coal required for power stations. Increase of draft, creation of roll-on/roll-off berths and mechanisation shall improve the load handling capabilities of ports. All these ports must be given priority in effective road/rail connectivity.

14.89. Adequate manufacturing capacities of main plant equipment including that for large supercritical thermal sets shall be available indigenously to meet the capacity addition requirement of the country during the Twelfth Plan. Regarding balance of plants construction agencies and construction equipment/techniques, the capacities and capabilities have to be further developed and enhanced. There is no shortage of key material except Cold Rolled Grain Oriented Steel, higher grade Cold Rolled Non Grain Oriented Steel and thick boiler steel plates. There is a need to set up plants to produce Cold Rolled Grain Oriented Steel, augment indigenous capacity for tubes and pipes, create short circuit testing facilities for transformers, augment manufacturing facilities for gas-insulated substations and create indigenous

capacity for thicker boiler water plates. It should be possible to set up domestic capacity in these areas which is internationally competitive.

Management of Energy Demand and Energy Efficiency

14.90. Improving energy efficiency is an important instrument for containing the demand for energy and several initiatives are possible in this area. The Bureau of Energy Efficiency (BEE) and the Ministry of Power (MoP) had introduced a number of schemes during Eleventh Plan for promotion of energy efficiency in India. The schemes of BEE include Standards and Labelling (S&L), Energy Conservation Building Code (ECBC), Energy Efficiency in Existing Buildings, Bachat Lamp Yojana (BLY), SDA strengthening, Energy Efficiency in Small and Medium Enterprises (SMEs), Agriculture and Municipal Demand Side Management (DSM) and Contribution to State Energy Conservation Fund (SECF). Schemes implemented by the Ministry of Power include Energy Conservation Awards and National Mission for Enhanced Energy Efficiency (NMEEE). These schemes are estimated to have achieved savings equivalent to 11,000 MW of avoided power capacity during the Plan. Details of savings projected to be realised through various measures are given below, along with Plan for the period 2012–17.

Energy Efficiency in Equipment and Appliances

14.91. Large energy inefficiencies exist in consumer and industrial appliances. The S&L Programme was quite successful during the Eleventh Plan period and it is anticipated that by the end of the Eleventh Plan, total savings in avoided capacity addition would be 7,315 MW. Under this scheme, a large number of appliances were covered initially under the voluntary labelling categories, out of which four appliances/equipment are under the mandatory labelling program. The Eleventh Plan has already envisaged coverage of 21 appliances under S&L. This programme will be continued and expanded during the Twelfth Plan.

Efficiency in Transport

14.92. As on 2010–11, there were a total of 13.3 million passenger cars in India which consumed about

9 mtoe. An additional 1.1 million passenger cars are added every year. In the transport sector, a labelling scheme is envisaged which is aimed at achieving energy efficiency. This will cover:

- Introduction of fuel economy norms effective from the first year of the Twelfth Plan. This will be mandatory from 2015 under the Energy Conservation Act.
- Technical study for two- and three-wheelers and commercial vehicles (Trucks and Buses) to finalise additional S&L Programme. Norms for these will be modified.

14.93. The targeted energy saving by the end of the Twelfth Five Year Plan is 4.3 mtoe in the sector.

Energy Efficiency in Industries

14.94. The total commercial energy consumed by industry including SMEs stands at about 40–50 per cent of the total commercial energy consumption in the country. Hence energy efficiency measures would yield substantial benefits in this sector. The projected energy saving potential in the Twelfth Plan is 13.18 mtoe which consists of a saving of 6.2 mtoe from the seven energy-intensive industries (DCs), 1.75 mtoe from SME sector and 5.23 mtoe from thermal power stations sector.

National Mission for Enhanced Energy Efficiency (NMEEE)

14.95. NMEEE is one of the eight Missions created by India's National Action Plan for Climate Change and is based on the Energy Conservation Act, 2001.

The Mission will enable transactions in energy efficiency. Specific initiatives envisaged by the NMEEE include:

- Perform Achieve and Trade scheme—a market-based mechanism to enhance energy efficiency (see Box 14.3 for details). The scheme is expecting an energy saving of 3.5 million tons of oil equivalent (mtoe) in seven selective industrial sectors and 3.1 million tons of oil equivalents in thermal power stations by 2014–15;
- Market Transformation for Energy Efficiency (MTEE)—CDM roadmap, Standards and Labelling, ESCO promotion, capacity-building;
- Financing Energy Efficiency—tax exemptions, revolving fund, Partial Risk Guarantee Fund; and
- Promotion of performance contracting business model—enabling upgradation of existing buildings, streetlights, municipal pumping and so on through Energy Service Companies which invest in the upgradation and are paid through sharing of the resultant savings in the energy bill.

14.96. Fans and Lights are the major users of electricity in homes and offices across the country. Energy consumption by fans and lights is expected to occur rapidly because of increasing incomes and enhanced access to electricity. During the Twelfth Plan period the introduction of 'super-efficient' lights and fans will be incentivised so as to accelerate their development and adoption to enable lower the rate of growth of electricity demand while enhancing services to households.

Box 14.3 **Perform, Achieve and Trade Mechanism**

The Perform, Achieve and Trade (PAT) mechanism is a market-based mechanism to incentivise improvements in energy efficiency in eight energy-intensive industries (including TPS) by setting up standards and certification of energy saving achieved which can be traded. The vision for PAT scheme during Twelfth Plan covers the following points:

- While implementation of the first cycle of PAT is to achieve the set target of 6.6 mtoe by 2014–15, widening and deepening the scope of PAT during the second cycle of PAT envisages including other energy-intensive sectors like refineries, Chemicals, Petrochemicals, Automobile Manufacturing, Sugar, Glass and so on to reduce the threshold energy consumption limit;
- Fiscal instruments like Partial Risk Guarantee Fund (PRGF) and Venture Capital Fund for Energy Efficiency (VCFEE) which have been proposed in NMEEE for successful implementation of PAT scheme will be expanded in order to provide confidence to the financial institutions and to equity investors to invest in energy efficiency products and companies.

14.97. Major R&D programmes may be initiated in selective areas and selective sectors for developing new customised energy-efficient technology through indigenous development of applications of already available energy efficient technologies/concepts.

14.98. The total projected saving in the year 2016–17, that is, end of the Twelfth Five Year Plan is of the tune of 11.43 mtoe in which 10.41 mtoe is contributed by thermal energy. The rest, which is equivalent to 11.96 BU of electricity saving is estimated at busbar in 2016–17.

Policy Reforms in the Power Sector

14.99. The Twelfth Plan must push for policy reforms in several areas, the most important of which are listed below:

1. Resolution of fuel supply problems related to availability of coal and gas for the plants expected to come on stream in the Twelfth Plan will be critical. These are discussed in the section on Coal and Gas in this Chapter.
2. The introduction of open access must have top priority. State Governments, SERCs and Discoms need to conform to the Electricity Act, which prohibits tariff regulation for consumers of 1 MW and above. These consumers must be free to purchase electricity through open access in a competitive market. Where cross-subsidy is required, an open access surcharge may be levied. The Act requires phased implementation of open access to all consumers. By the end of the Twelfth Plan, all consumers up to 0.25 MW may be covered.
3. There is a need to develop ancillary power markets and CERC should come out with a framework for implementation of such market. To facilitate further development of power market, jurisdiction issues regarding forward and future market products may be clarified in the policy/Act. Development of markets can be expanded further by permitting short-term procurement for three months in advance by the Discoms. Also, long-term procurement and medium-term procurement by the Discoms may be encouraged and impediments, if any, may be identified and removed.
4. Strengthening of NLDC/RLDCs/SLDCs is vital for effective grid management and for implementation of open access. It is necessary to separate the management of POSOCO from PGCIL. The State Governments must take steps to upgrade and modernise the SLDCs which must be made functional and financially independent in accordance with the Electricity Act.
5. Spinning reserves need to be facilitated for grid stability at the regional level to accommodate infirm renewable energy injection into the grid. The State Governments need to contract additional capacity for this purpose.
6. Suitable incentives for low-cost transmission, linking the renewable energy generation sources, development of smart grid for evacuation and transmission of renewable power and creation of spinning reserves may be done through the National Clean Energy Fund.
7. There is a need to strengthen measures for increasing share of renewable energy over time. SERCs should provide long-term trajectory for renewable purchase obligations and issue relevant regulations within a specified timeframe. Further, for the procurement of renewable power, demand of more than one distribution licensee may be pooled at the State level or jointly among States and procurement through competitive bidding route under section 63(a) of Electricity Act 2003/National Tariff Policy should be made permissible.
8. Power procurement and allocation of power must be done in line with the Tariff Policy and the guidelines/standard bid documents (SBD) issued by Government of India under the Electricity Act, 2003. The National Electricity Policy (2005) may need to be suitably amended to ensure State Governments abide by these provisions.
9. Consumer Grievance Redressal Forum (CGRF) should be made a multi-member set-up comprising representation from all stakeholders. The office of Ombudsman should be funded by the SERCs.
10. Reforms in the distribution sector should include:
 - a. Prepaid metres to those categories of consumers who are chronic defaulters, 100 per

- cent spot billing, spot collection, semi or fully automatic meter reading and standardisation of metering protocols for extensive use of automated meter readings.
- b. Institution of Chief Electrical Inspectorate to Government of India/State Government (CEIG) to be strengthened and to work out a scheme for delegation of authority of mandatory inspection including self-certification to the CEIG to liberalise it from unnecessary controls.
 - c. Separation of rural feeders to control losses and improve power availability. Dedicated feeders may be extended to energy-intensive consumers at their cost.
11. The State Government should clear all the outstanding dues to the utilities, and ensure timely payment of subsidy. State Governments with financially strained Discoms should be encouraged to undertake restructuring of the debt as per the package recently approved by the Cabinet. This includes restructuring of short-term loans of Discoms with poor financial health, sharing by concerned State Governments of the burden of the utilities to the extent of 50 per cent of such short-term loans, provision of special market bonds and relaxation of FRBM norms for the State Governments. Financial restructuring should be supported by regular revision of tariff through adoption of regulations suggested by Forum of Regulators, including automatic tariff adjustment with change in fuel prices and other reform measures to ensure regular revision of tariff and simultaneous investments in reducing AT&C losses.
12. There is a need for an independent oversight over programmes like RGGVY and R-APDRP on a concurrent basis. These should be incorporated in these schemes for the Twelfth Plan.

3.3. COAL AND LIGNITE SECTOR

14.100. Coal is the mainstay of India's energy sector accounting for over 50 per cent of primary commercial energy supply in 2010–11. This share will actually increase to 57 per cent over the next 10 years. The gap between the demand and the domestic

supply of coal has made it imperative to augment domestic production both from the public sector and the private sector and to expedite the reform process for realising efficiency gains through increased competition in the sector during the Twelfth Plan. An important feature of the Eleventh Plan was the attempt to augment domestic coal production from captive mines. However, the programme has slipped and expected production from captive blocks fell well short of the projected target of 104 million tonnes in the terminal year of the Plan because only 29 captive blocks could start production out of the 195 blocks allocated so far. The main impediments in the progress of captive mining are reported to be similar to those in other PSU-held blocks like delays in forest and environmental clearances, problems of land acquisition and R&R, allocation of a block to more than one user and so on. CIL will continue to play a major role in meeting the coal requirements of the country but the growth in CIL production will not be enough to meet the rising demand. Hence, efforts need to be made to ensure that additional captive coal blocks start producing in Twelfth Plan to meet the rising coal demand. It is also necessary to plan for larger imports of coal.

REVIEW OF THE ELEVENTH PLAN

Coal Demand and Production

14.101. The target for coal production at the end of the Eleventh Plan was initially set at 680 million tonnes and revised downwards to 630 million tonnes at the time of the MTA. The actual achievement was only 540 million tonnes. Since demand in the terminal year (2011–12) of the Eleventh Plan was around 640 million tonnes there was a large demand–supply gap of 100 million tonnes which was only partially met by imports. This has adversely affected the coal supplies to end consumers, particularly the power sector. It is estimated that out of capacity addition of 41,894 MW, around 25,000 MW of coal-based capacity commissioned is being sub-optimally utilised because of inadequate availability of domestic coal.

14.102. The widening gap between demand and supply has to be met by imports because of which the share of imports in the total coal demand is likely to

TABLE 14.22
Details of Coal and Lignite Production

Sl. No.	Parameter	Tenth Plan 2006–07	Eleventh Plan (2011–12)			Eleventh Plan % CAGR		
			Initial	MTA	Latest	Initial	MTA	Latest
0	1		2	3	4	7	8	9
1	Coal Demand (million tonnes)	474.18	731.10	713.24	640.00	9.53	8.98	6.98
2	Coal Production (million tonnes)	430.84	680.72	629.91	539.99	9.58	7.89	4.62
3	Imports	43.08	51.00	83.33	90.00	3.43	14.11	15.88
4	Imports as per centage of total demand	9.00	6.98	11.68	14.06			
5	Lignite Production (million tonnes)	31.28	54.96	42.59	41.64	12.04	12.04	6.72

Source: Ministry of Coal.

increase to around 14.06 per cent in 2011–12 as compared to just 9 per cent in the year 2006–07. Details of coal imports in Eleventh Plan are given in Table 14.22.

Lignite Production and Demand

14.103. The Eleventh Plan envisaged lignite production to reach 54.96 million tonnes in the terminal year of the Plan (2011–12) from 31.13 million tonnes in 2006–07 yielding a growth rate of 12 per cent. The projected production of 54.96 million tonnes was expected to come from lignite mines spread in three contributing States with their respective share as 24.23 million tonnes from Tamil Nadu, 22.26 million tonnes from Gujarat and 8.47 million tonnes from Rajasthan. However, actual production in 2011–12 was 43.10 million tonnes combined from all the three states. This shortfall is mainly due to non-starting of several mines under Private and State Sector and due to delay in commissioning of lignite-based power plants and certain mines under the Central Sector. As far as NLC is concerned, thinning of lignite seam thickness and the washout zone encountered in Mine I is the main reason for the shortfall of 2.42 million

tonnes in Tamil Nadu. Similarly, in Barsingsar Mine under NLC at Rajasthan, though the mine is ready in all respects to give full production, it was warranted to limit its production to cope with the demand of its linked TPS which has certain teething problems. The lignite based capacity addition in the Eleventh Plan is 1,490 MW against the target of 2,280 MW.

Coal and Lignite Reserves

14.104. The inventory of geological resources of India's coal and lignite reserves as on 1 April 2010 has been shown in Table 14.23. This is 15.09 per cent higher than the reported reserves level of 255 billion tonnes in January 2007. Corresponding increase in lignite reserves level is 9.6 per cent from 38.27 billion tonnes reported level in 2007. The accretion of coal resources over the years has been shown in Table 14.24.

Review of the Central Sector Schemes

14.105. The schemes implemented with budgetary support from the Ministry's plan covered regional/promotional exploration, detailed drilling in non-CIL blocks, Environmental Measures and

TABLE 14.23
Inventory of Coal and Lignite Reserves as on 1 April 2012

	Proved	Indicated	Inferred	Total
Coal	118.145	142.169	33.183	293.497
Lignite	6.18	25.76	10.02	41.96

Source: Ministry of Coal.

TABLE 14.24
Accretion of Coal Reserves

Reserves as on	Proved Category	Accretion in Proved Category	Inferred Category	Indicated Category	Total Reserves	Reserves Accretion
1 January 2005	92,960	–	1,17,090	37,797	2,47,847	–
1 January 2007	97,920	4,960	1,18,992	38,260	2,55,172	7,325
1 April 2008	1,01,829	3,909	1,24,216	38,490	2,64,535	9,363
1 April 2009	1,05,720	3,891	1,23,570	37,921	2,67,211	2,676
1 April 2010	1,09,798	4,078	1,30,654	36,359	2,76,810	9,599
1 April 2011	1,14,002	4,204	1,37,471	34,390	2,85,862	9,051

(million tonnes)

Source: Coal Directory of India.

Subsidence Control scheme (EMSC), R&D schemes, Conservation and Safety measures and development of transport infrastructure in the coal fields and so on.

Regional/Promotional Exploration

14.106. Exploration for coal and lignite in the country is taken up in stages. In preliminary exploration, geological surveys are undertaken by the Geological Survey of India (GSI) to identify potential coal and lignite areas. Regional promotional exploration aims at widespread drilling to establish broad framework of the deposits to facilitate planning for detailed exploration and subsequent projectisation and mine development. While regional exploration drilling target for Eleventh Plan was 1.94 lakh metres which was revised to 1.47 lakh metres, promotional drilling target was 4 lakh metres. Against the envisaged targets, achievement will be 1.14 lakh metres (about 78 per cent) in case of regional drilling, establishing 7.07 Bt of coal and 2.95 lakh metres (74 per cent) in case of promotional drilling, establishing 20.05 Bt of coal resources.

14.107. In case of lignite, regional exploration drilling achievement is likely to be 1.32 lakh metres against a target of 1.48 lakh metres during Eleventh Plan mainly by NLC and by other agencies, viz. GMDC and RSMML establishing 1.85 Bt of lignite resources. Achievement in promotional exploration is likely to be 2.74 lakh metres (78 per cent) against a target of 3.50 lakh metres establishing 3.22 Bt of lignite resources.

14.108. 2D HRSS surveys were not a part of the exploration programme of Eleventh Plan. However, in view of trends worldwide, these surveys were considered as a part of regional (promotional) exploration by Subcommittee on Energy Minerals. The National Geophysical Research Institute (NGRI), a premier organisation for geophysical studies in the country, was therefore, inducted to carry out these surveys in coal and lignite bearing areas. It is expected that a total of 31 Line kilometre (L.km) in coal areas and 94 L.km in lignite areas HRSS survey will have been carried out during the Eleventh Plan.

Detailed Drilling in Non-CIL Blocks

14.109. Detailed exploration surveys focus on establishing adequate geological resources data for projectisation and mine development. The blocks outside the purview of CIL have been proposed to be explored in detail for reducing the time lag between offering the blocks to potential entrepreneurs and starting of the operation by them through budgetary support. The cost of exploration, in turn, will be recovered from entrepreneurs who have been allotted the blocks. CMPDI and its contractual agencies including MECL have been able to progress well in detailed exploration activities and are expected to achieve 8.09 lakh metres against a target of 13.50 lakh metres in non-CIL blocks establishing 5.2 Bt of private coal reserves.

14.110. Regarding detailed exploration in CIL blocks as against a target of 5 lakh metres, the actual achievement has been 11.2 lakh metres (224 per cent)

of exploratory drilling achieved by CMPDIL and by contractual agencies including MCCL and 9.01 billion tonnes of coal reserves were proved during the Eleventh Plan. SCCL has achieved 2.99 lakh metres of actual drilling against a target of 3.39 lakh metres and estimated 0.91 billion tonnes of coal reserve through detailed exploration.

Productivity and Benchmarking

14.111. Traditionally, the output per man shift (OMS) has been measured as tonnes in coal mines and it has improved significantly for all the three PSUs operating in coal and lignite mining. While overall OMS in case of CIL improved from 3.54 in year 2006–07 to 4.92 in year 2011–12 this was still lower than the target of 5.54 in the terminal year of the Eleventh Plan. In case of SCCL this has improved from a level of 2.39 to 3.80 over the same period, which is significantly higher than the target of 2.67. This significant improvement in overall OMS level is for both opencast and underground mining operations. This could be due to the outsourcing of some of the activities, particularly in the opencast mining operations. In case of NLC, the improvement is marginal because lignite production level could not increase due to delays in the completion of lignite-based power plants. One of the important areas to improve productivity is benchmarking of operations and equipment productivity. Productivity of equipment and machinery used in opencast and underground mining has significantly improved during the Eleventh Plan period.

Clean Coal Technologies

14.112. Coal beneficiation is one of the prime clean coal technologies aimed at supplying washed coal to the pulverised coal combustion boilers of power plants. The MoEF's directive aimed at restricting the use of coal of not more than 34 per cent ash content at thermal power stations located far away from pit heads and load centres and critically polluted areas, has also contributed to improvement in economics of operations of such power stations. The CIL envisaged building 20 new washeries with a capacity of 111 mt in the Eleventh Plan. However, coal washing capacity did not grow as planned due to delays in

awarding of contracts to set up washeries by the CIL. The coal washing capacity at the end of the Eleventh Plan is as indicated in Table 14.25.

TABLE 14.25
Coal Washing Capacity by the end of
Eleventh Plan Period

	(in million tonnes)	
	Coking Coal	Non-coking coal
Public	24.22	17.22
Private	5.66	78.74
Total	29.88	95.96
Washed Coal Production	7.18	40.95

Coal Bed Methane

14.113. The potential of Coal Bed Methane/Coal Mine Methane was recognised in a new policy of Government of India in 1997. The Ministry of Coal (MoC) and the Ministry of Petroleum and Natural Gas (MoP&NG) are working together for the development of Coal Bed Methane and the Government has offered 33 blocks in four rounds of bidding for CBM covering 17,416 sq. km of area. One block in Raniganj coalfield has commenced commercial production in 2007 and two blocks are in advanced stage of commencing production. The Director General of Hydrocarbons (DGH) is the regulator for CBM activities in the country. The CBM/CMM clearance house has been established in CMPDIL, Ranchi, in collaboration with United States Environment Protection Agency (USEPA) which will provide information for development of CBM/CMM in India. The current level of production, being only 0.2 mmscmd, is confined mostly to the private sector. There is no separate pricing regime for CBM and the gas prices are determined by the developer, subject to Government approval.

Research and Development

14.114. A total of 29 R&D projects were implemented during the Eleventh Plan. Out of these, 16 projects have already been completed by September 2012. Remaining 13 projects are likely to slip into the Twelfth Plan period. Some of the major projects under implementation are:

- Development of CMPDI capacity for delineation of viable coal mine methane (CMM)/abandoned mine methane (AMM) blocks in the existing and potential mining areas having partly de-stressed coal in virgin coal seams.
- Recovery and utilisation of coal methane in Jharia and Raniganj coalfields.
- Development of immediate roof fall prediction system in underground mines using wireless network.
- Demonstration of cost-effective technology for dry beneficiation of coal by all airjig.
- Demonstration of coal dry beneficiation system using radiometric technique.
- Assessment of prospect of shale gas in Gondwana basin with special reference to CIL areas.
- Development of indigenous catalyst through pilot-scale studies of coal to liquid (CTL) conversion technology.
- High resolution seismic monitoring for early detection and slope failures in opencast mines.
- Application of Ground Penetrating Radar (GPR).
- Integrated communication system to locate trapped miners in underground mines.
- Development of self-advancing (mobile) goaf edge supports (SAGES) for de-pillaring operations in underground coal mines.

Conservation and Safety in Coal Mines

14.115. Safety of miners and safe mining operations are of paramount importance in coal mining. These two schemes are under the statutory provisions of Coal Conservation and Development Act (CCDA) and were being implemented as a part of non-Plan scheme during the Tenth Five Year Plan through reimbursement of cess collected under CCDA. The Ministry of Finance has taken a view that cess collected under CCDA is a revenue of the Government of India, which is reimbursed back to coal companies for implementation of these schemes. Therefore, these schemes are treated as Plan schemes during the Eleventh Plan.

Development of Transport Infrastructure in Coal Field Areas

14.116. Development of infrastructure in coalfields is essential to ensure the timely evacuation of coal produced in mines to the rail heads or railway yards.

Also substantial time is taken by Railways to build the critical rail links and that is affecting the movement of coal to the end users. Four critical rail links that have been pending for years are the Tori-Shivpur-Katholia rail link in North Karanpura coalfield (CCL command area), the Bupdevpur Baroud rail link connecting coal blocks in Mand Raigarh coalfield, the Jharsuguda-Barpalli railway line in IB valley coalfield and the Sattapalli-Bhadrachalam rail link (SCCL command area). Commissioning of these lines would facilitate movement of around 125–130 million tonnes of coal to end users. Construction of Tori-Shivpuri line was delayed due to delays in getting forest clearance. Railways have changed the alignment of the line to bring down the forest land involved and MoE&F has cleared the project recently with certain conditions. Railway Board is yet to approve the implementation of the Bupdevpur Baround rail link. CIL, State Government and Railways are in discussion to implement other critical links in Mand-Raigarh area in joint venture to facilitate coal movement from the upcoming mines. The SCCL and Railways were not able to sort out the differences in the implementation of Sattapalli-Bhadrachalam link project but this issue has been resolved recently and SCCL has agreed to provide funds to the Railways to implement the project on turnkey basis.

Environmental Measures And Subsidence Control

14.117. The purpose of this scheme is to improve environmental conditions in old mined-out areas, particularly Jharia and Raniganj coalfields through implementation of a number of schemes for mitigating the damage caused by unscientific mining, carried out before nationalisation of coal mines. Under the scheme, a Master Plan proposal for Jharia-Raniganj coalfields with a total outlay of ₹9,773.84 crore was taken up to deal with fire, rehabilitation of uncontrollable subsidence-prone inhabited areas and diversification of roads/railway lines within command area of BCCL and ECL. Recently, the Cabinet has approved the scheme. For implementation of the Master Plan, Jharia Rehabilitation and Development Authority (JRDA) for BCCL areas and Asansol Durgapur Development Authority (ADDA) areas have been notified as implementing agencies by

the respective State Governments of Jharkhand and West Bengal. A High Powered Central Committee under the Chairmanship of Secretary (Coal) with representatives from other Ministries/Departments, State Governments of Jharkhand and West Bengal and concerned coal companies, has been monitoring the implementation of the Master Plan. Demographic surveys and land acquisition by JRDA and ADDA are in progress.

Integrated Coal and Lignite Resource Information System (ICRIS and ILRIS)

14.118. ICRIS and ILRIS are coal and lignite resources structured on the UNFC pattern approved in October 2004 and are under progress at different data centres in CMPDI/Singareni and NLC. These projects need to be continued during the Twelfth Plan with enhanced outlays for successful completion, maintenance and regular updating.

Application of Information Technology

14.119. Information Technology (IT) has been used by the coal industry in India for improving productivity and decision making. Some of the applications already in use are:

- Enterprise resource planning (ERP).
- Real-time trip counting system at opencast mines with latest technologies like GPS, GIS, GSM, RFID, Wi-Fi and so on.
- Proximity warning system for HEMM at opencast mines.
- Truck movement monitoring system at weighbridges and coal handling plants mines with latest technologies like GPS, GIS, GSM, RFID, Wi-Fi, and so on.
- Online underground air and gas monitoring systems (CH₄, CO, Temperature).
- UG communication system and miners' tracking with warning system for the miners entering the unsafe areas.

14.120. An SAP-ERP system in coal mines in the country has been introduced by SCCL with effect from July 2008 covering business processes related to Purchase and Stores, Marketing and Dispatches, Quality Management, Human Capital Management,

Finance and Accounts, and Costing. The CIL is also in the process of adopting such a system in the near future.

Financial Performance of Coal Sector

14.121. The approved Eleventh Plan outlay of ₹37,100 crore for MoC was planned to be financed through an IEBR of ₹35,774.37 crore, and a GBS of ₹1,326.00 crore. The budgetary support sought for the Ministry's plan schemes covered regional/promotion exploration, detailed drilling in non-CIL blocks, Environmental Measures and Subsidence Control Scheme (EMSC), R&D schemes, conservation and safety measures and development of transport infrastructure in the coal fields. These schemes were proposed to be funded by subsidence excise duty collected under CCDA, IEBR of CIL and budgetary support. Actual expenditure during the Eleventh Plan is ₹26,337.62 crore which is only 63 per cent of the approved outlay. This comprises ₹26,374.20 crore of IEBR of three PSUs namely CIL, SCCL and NLC and balance ₹1,500 crore GBS for Ministry of Coal funded schemes. The major shortfalls are in the reported expenditure of CIL and NLC whereas SCCL is expected to spend ₹3,707.59 crore against the approved IEBR of ₹3,340 crore. The financial performance of the coal sector is summarised in Table 14.26.

THE TWELFTH PLAN

Coal Demand

14.122. Total demand for coal grew by around 6.6 per cent during the Eleventh Plan against domestic production growth of only 4.61 per cent, and the gap was filled from higher imports. The projected GDP growth targeted during the Twelfth Plan will lead to a high demand for coal in the next five years on a business-as-usual basis. However, increased efficiency measures, including introduction of super-critical technology in power plants will reduce the demand for coal. The trend growth for coal demand during the Twelfth Plan is therefore likely to be similar to that in the Eleventh Plan.

14.123. Ministry of Coal has projected two scenarios of coal demand during the Twelfth Plan. Scenario I

TABLE 14.26
Financial Performance of the Coal Sector

(in ₹ Crore)

Sl. No.	Sector	The Eleventh Plan Outlay		
		Approved	MTA	Anticipated
1	CIL	17,390.07	16,090.68	13,460.78
2	SCCL	3,340.00	3,802.07	3,707.59
3	NLC–Power	12,051.41	6,140.61	6,246.36
4	NLC–Mines	2,826.00	2,334.39	1,483.67
5	Total NLC	14,877.41	8,475.00	7,730.30
	Total IEBR	35,607.48	28,367.75	24,898.40
6	Central Sector Schemes	1,326.01	4,225.80	1,416.19
	Total MOC	36,933.49	32,623.55	26,314.59

projects a demand of 1,204 mt in the terminal year of the Twelfth Plan and Scenario II projects 980.5 mt. Scenario I implies 13.5 per cent CAGR and Scenario II implies a growth rate of 8.9 per cent. Scenario II is considered realistic, based on specific consumption in each consuming sector observed in the past few years. From this scenario, total coal demand will reach 980.50 million tonnes, an increase of 186 million tonnes over the Twelfth Plan period as shown in Table 14.27.

TABLE 14.27
Coal Demand during the Twelfth Plan

(in million tonnes)

Sector	Eleventh Plan (2011–12)	Twelfth Plan (2016–17)
	Annual Plan Demand Projection	Demand Projection Scenario II
Coking Coal	46.67	67.20
Power Utility	412.00	682.08
Power Captive	40.00	56.36
Cement	28.89	47.31
Sponge Iron	30.47	50.33
Others*	81.97	77.22
Total non-coking	593.33	913.30
Grand Total	640.00 (6.6 %)	980.50 (8.9 %)*

* Annual average growth rate during the Twelfth Plan period.

Source: Working Group on Coal and Lignite.

14.124. The total demand by the power sector including that from captive power plants is expected to be 75 per cent of the total coal demand during the terminal year of the Twelfth Plan. The share of the steel sector is expected to be 6.85 per cent of the projected demand and the shares of cement and sponge iron sectors are expected to be 4.8 per cent and 5.1 per cent respectively and balance 7.9 per cent is estimated to be consumed by the brick and others sectors. Cumulative annual growth rate of coal demand during the Twelfth Plan is projected to be around 8.9 per cent. Coal demand for Eleventh Plan and Twelfth Plan is given in Annexure 14.2.

14.125. The total addition to electric generation capacity in the Twelfth Plan is targeted at 88,536.6 MW, which includes 69,280 MW of coal-based capacity. The estimates for coal requirements of the power sector have been computed considering the fact that 40,000 MW of capacity based on Supercritical technology will be added in the Twelfth Plan and efficiency measures are also being taken. Further, power generation capacities were running at very high PLF so far, in view of high demand–supply gap. With the planned increase of new capacities and the pace of setting up new power capacities getting accelerated, the PLF of the power plants is likely to go down. Taking all these factors together, it is estimated that the total demand for coal from the power sector may be 738.44 mt in the terminal year of the Twelfth Plan 2016–17. Taking into account

the requirements of steel, cement and other sectors of the economy, the total coal demand is estimated at 980.50 mt. The quality of coal available from the MCL and IB valley mines has been poor and a large portion of coal during the Twelfth Plan will be provided by these mines. If the overall quality of coal available from domestic mines deteriorates, the total coal demand may go up.

Coal Production

14.126. The initial years of the Twelfth Plan are likely to see continuing constraints on coal availability reflecting the difficulties experienced in increasing production in the last two years of the Eleventh Plan. Delays in obtaining E&F clearances, land acquisition and R&R issues continue to plague coal production and remedial action is urgently needed. There is an urgent need to take effective measures to step up coal production. The Working Group on Coal in the most optimistic scenario (Scenario II) has suggested domestic production for the Twelfth Plan period from various sources as shown in Table 14.28.

TABLE 14.28
Coal Production

Sector	(in million tonnes)	
	Eleventh Plan (2011–12)	Twelfth Plan
		(2016–17) Projection Scenario II
CIL	435.84	615.00
SCCL	52.21	57.00
Captive Blocks	36.04	100.00
Others	15.91	23.00
Grand Total	540.00	795.00

Source: Ministry of Coal.

14.127. The incremental production envisaged in the optimistic Scenario of the Twelfth Plan works out to 255 million tonnes over the production level of 540 million tonnes during the Eleventh Plan. Major contribution has to come from the CIL, which is expected to add incremental production of 185.5 million tonnes yielding a cumulative annual growth rate in coal production of 8 per cent. This is much higher than the actual growth rate of 4.6 per cent achieved in the Eleventh Plan. Details of coal production in

the Eleventh Plan and envisaged production during the Twelfth Plan period are given in Annexure 14.3.

14.128. A number of initiatives are being taken to promote faster extraction of coal. The policy on competitive bidding for allocations of captive blocks has been finalised by the Ministry of Coal and is expected to be made operational during 2012–13. This should result in allocation of new coal blocks.

Import Requirements

14.129. The level of imports at the end of the Twelfth Plan is projected to increase from 137 million tonnes of Indian quality coal at the end of the Eleventh Plan to 185 million tonnes at the end of the Twelfth Plan based on total coal demand of 980 million tonnes and domestic supply of 795 MT. If domestic supply does not match the target growth rate of 8 per cent per year, the import demand will be higher. The projected level of imports of around 185 million tonnes is large keeping in mind that international trading in coal is only around 900–1,000 million tonnes (15–16 per cent) of the total consumption of over 6,000 million tonnes world over, and there are competing requirements from other countries like China who have large coal-based capacities. The international availability of coal is going to be restricted due to concerns on climate change. International prices of coal are also likely to remain high because of taxes which are being imposed by several coal-producing countries including Australia and Indonesia.

Underground Mining

14.130. Only 15 per cent of India's coal production is from underground mines. The industry aims to reach a total coal production of 30 per cent from underground mines by 2030. There is a clear trend towards underground mines as this has positive implications for the environment. However, the extraction of coal from the underground mines is lower than that from the opencast mines. In forest areas, underground mining is clearly feasible and will sharply reduce the impact of ecological degradation. It is, however, feasible only if the pool reserves and the seam thickness permits its exploitation accordingly. The share of coal production for underground mines in major coal producing countries is given in Table 14.29.

TABLE 14.29
Share of Underground Production in Total Production

Sl. No.	Country	Percentage (%)
1	China	90
2	USA	33
3	Australia	20
4	India	10

14.131. Considering the emerging hurdles in forest clearance and land acquisition in future, serious efforts need to be made to increase the share of underground production considerably by the end of the Twelfth Plan by focusing on long wall technology and productivity in underground mines. Indian coal companies must accept the challenge of transplanting the international best practices with more effective management. CIL can have joint ventures or formulate PPP projects with appropriate terms with renowned international players to shore up the underground production level in the Twelfth and the Thirteenth Plans.

Lignite Demand and Production

14.132. The Twelfth Plan envisages lignite demand of 68.60 million tonnes in the terminal year 2016–17 of the Plan which includes production from Tamil Nadu, Gujarat and Rajasthan—27.20, 21.60 and 19.80 million tonnes respectively. The additional lignite-based power generation capacity during the Twelfth Plan is envisaged as 2,280 MW. It is stated that projected lignite production of 68.60 million tonnes would almost be adequate to meet the growing demand for various sectors consuming lignite. The projected shortfall would be around 10 million tonnes which needs to be met by either taking up new mines or improving the production levels from the existing mines.

Coal Pricing

14.133. Globally, pricing of coal is based on gross calorific value (GCV) of coal. The Integrated Energy Policy which was based on the Integrated Energy Policy Report of the Planning Commission, and was approved by the Cabinet in December 2010, had proposed adoption of this pricing system. This was finally implemented in January 2012 with the

Ministry of Coal issuing a notification for pricing of coal on GCV basis with effect from 31 January 2012, replacing the earlier system of pricing on the basis of useful heat value (UHV) which takes into account the heat trapped in ash content also, besides the heat value of carbon content. The revised GCV system has 17 bands of calorific values with a bandwidth of 3,000 kilo calorie each instead of the existing seven grades of A, B, C, D, E, F and G. The revision to GCV is likely to increase the prices of domestic coal to some extent. This is desirable adjustment because domestic thermal coal continues to be underpriced compared to internationally traded coal prices. International coal prices of thermal coal are currently about three to four times higher than domestic coal but this reflects the fact that imported coal is of higher calorific value and better quality. After adjusting for these differences, international coal prices are a little over twice the domestic prices as shown in Table 14.30. It must also be noted that the volume of coal traded is small compared to international production which makes international prices a less reliable guide. Table 14.30 compares domestic coal prices of thermal coal in India with the domestic sale price of thermal coal in other countries. The comparison shows that Indian coal is underpriced even on this basis. It is necessary to plan for a steady upward price adjustment over the Twelfth Plan period.

TABLE 14.30
Price Comparison of Domestic Coal with other Countries

Country	Calorific Value K (Cal/Kg)	Price (US \$ per tonne)	Price (in ₹/Mk Cal)
China	5,000–6,000	70	636
USA	5,000–6,000	40	363
India	3,500–4,000	26	342

14.134. The price differential between domestic and imported coal creates distortions in the power sector. Since Coal India is not in a position to provide domestic coal to meet the demand of all power generating units expected to come on stream in the Twelfth Plan, increased reliance on coal imports is

necessary. However, power generators supplying power with PPAs at a regulated tariff will not be able to pass on the higher cost of imported coal. There is a need to consider a mechanism of price pooling under which Coal India undertakes to meet the full FSA requirement using a combination of domestic and imported supplies, pooling the price of its imports with its domestically produced coal to give coal to power generators at a uniform price.

Coal Movement Constraints

14.135. Currently the share of rail in movement of coal in the country is around 52 per cent. The share of other modes of transportation is 15 per cent by merry-go-round (MGR), 7 per cent by belt/rope and 27 per cent by road. Against this, the coal movement matrix in the terminal year of the Twelfth plan (2016–17) is envisaged to show a 58 per cent share of rail, 25 per cent share of road, 11 per cent of MGR and 6 per cent of belt/rope. This includes planning for movement of 800 million tonnes of indigenous coal and coal products and 166 million tonnes of imported coal which is equivalent to about 250 million tonnes of domestic coal. To realise this objective, average wagon requirement is envisaged at 446.4 rakes per day out of which 165.6 rakes per day will be required for imported coal. The annualised growth in rail loading is expected to be 7.1 per cent.

14.136. Some of the important identified railway infrastructure projects are at North Karanpura, Mand–Raigarh and at Ib Valley coalfields. These projects were initially proposed during the Eleventh Plan but could not be implemented due to delays in land acquisition and clearance from Environment Ministry. The current status of these projects is given in paragraph 14.116. In addition to these, a few more feeder lines have been suggested for improving rail movement during the Twelfth Plan in potential coalfields. Completion of these projects should have top priority in Railway Planning.

Coal Quality and Beneficiation

14.137. Coal washing is one of the practices being promoted as a measure to encourage implementation

of clean coal technologies. While coking coal washing has been in practice for quite some time in the country, washing of non-coking coal, particularly for power generation, has come into focus only recently. Use of washed non-coking coal has increased many-fold over the last 10 years. Currently coking coal washing capacity is around 29.88 million tonnes comprising of washery capacity of 22.18 million tonnes of CIL, 2.04 million tonnes of SAIL and 5.66 million tonnes of TISCO. However, the actual total washed coal production from all these washeries is much below the capacity at 7.03 million tonnes, with an approximate raw coal feed of 15.5 million tonnes. It has been observed that performance of CIL managed washeries is not satisfactory and the output of washed coal from CIL washeries is only 3.89 million tonnes.

14.138. Non-coking coal washing capacity in the country is around 96 million tonnes, comprising of 17 million tonnes of CIL and 79 million tonnes of others. In this case also, the output of washed coal is below capacity at around 36 million tonnes, with a raw coal feed of around 52 million tonnes. Thus, utilisation of existing washery capacity is suboptimal and suitable measures need to be taken to optimally use existing capacity. The CIL proposes to set up 20 more washeries with an aggregate capacity of around 111 million tonnes in the Twelfth Plan.

14.139. Considering the need to increase the level of washed coal, it is proposed to enhance washeries capacity in Twelfth Plan period. Coking coal washing capacity is likely to increase from the existing level of around 30 million tonnes in 2011–12 to 49 million tonnes by the end of 2016–17. Similarly the non-coking coal washing capacity is planned to increase from about 96 million tonnes by the end of the Eleventh Plan to around 175 million tonnes by the end of the Twelfth Plan.

14.140. There has been some progress in dealing with the problems of oversized coal. Coal companies are establishing Coal Handling Plants (CHPs) and feeder breakers. Coal India Ltd. is now supplying almost 99 per cent of crushed coal to the power sector. Further, deployment of surface miners in different projects

is also helping in producing sized coal for supply to the consumers. A total of 212 CHPs (74 major CHPs and 138 mini CHPs/Feeder Breakers) with a total capacity of about 277 million tonnes per annum are operating in different subsidiary companies of the CIL. Further, 50 surface miners deployed at CCL, SECL and MCL produced about 103 million tonnes of sized coal in the year 2010–11, which has helped augment supply of sized coal.

Exploration for Coal and Lignite

14.141. Coal and lignite exploration efforts should not only aim at expanding the resource base through regional exploration but also at upgrading the known resources remaining under 'Indicated' and 'Inferred' categories through detailed exploration to facilitate their projectisation for mining. Significant accretion of resource in coming years is envisaged in the intermediate and deeper levels (beyond 300m of depth). As such there is also an emerging need to fully bring out the potential of coal resources which are at greater depths, for other forms of exploitation like CBM, underground gasification (UCG) and so on to augment the coal resources.

14.142. With ever increasing demand of steel in the country the requirement of coking coal is projected to increase from 69.47 million tonnes to 85.06 million tonnes at the end of the Twelfth and the Thirteenth Plans. There is a need to focus exploration efforts on the prime coking coal resources available beyond 300 m of depth to bring them to 'Proved' category.

14.143. Against a target of 1.94 lakh metres for regional exploration during the Eleventh Plan, 1.14 lakh metres (78 per cent) of drilling will be achieved and 7.07 billion tonnes of coal resources are likely to be established. In promotional exploration, against a target of 4 lakh metres of exploratory drilling, 2.72 lakh metres (68 per cent) are expected to be achieved, establishing 20.05 Bt of coal resources. The Twelfth Plan envisages taking up 1.05 lakh metre regional explorations drilling to establish resource base of around 6.8 billion tonnes. The corresponding programme under promotional exploration envisages promotional drilling of 4.80 lakh metre covering an area of 1,204 Sq. Km. to establish resources

of 16.64 billion tonnes. Similarly a drilling target of 54.46 lakh metres is envisaged for detailed drilling in the Twelfth Plan which includes 19.03 lakh metres in non-CIL blocks. The envisaged coal resource establishment under detailed drilling is 76.80 billion tonnes including 16.22 billion tonnes under detailed drilling in non-CIL blocks.

Royalty on Coal and Lignite

14.144. According to a decision taken by the Government, royalty rates have to be revised periodically once in every three years. Based on the above decision, Ministry of Coal had set up a Committee to suggest revision in royalty rates in 2009. The Committee suggested ad-valorem royalty on coal and lignite instead of the earlier system of combination of specific and ad-valorem duty on various grades of coal. The Government has accepted the suggestion and approved the suggested royalty regime based on ad-valorem basis with effective royalty rates of 14 per cent on raw coal prices and 6 per cent on lignite with effect from April 2012.

Amendment to the Coal Mines Act

14.145. The Coal Mines (Nationalisation) Act, 1973 does not allow private companies to mine coal for sale to third parties though captive mining is allowed for specified end use sectors. This is a limited opening which is helpful but unlikely to attract big investment. Unless large investment and technology in the sector comes in, mining coal by a host of small players would not increase production to desired levels.

14.146. Development of large coal blocks holds the key to rapidly increase production. There are political sensitivities in opening up the coal sector to private investment, but it is simply not logical to keep private investment out of coal, when it is allowed in petroleum and natural gas. Besides, the energy security of the country needs full involvement of all concerned in producing coal. Hence, amendment to the Coal Mines (Nationalisation) Act is needed. A Bill to amend the Act for this purpose was introduced in Parliament in 2001 but has not been pursued. Allowing private sector mining does not involve privatisation of Coal India but only entry of new mining

companies. This issue needs to be considered in the interest of energy security.

New Initiatives to Expand Coal Availability

14.147. Given the importance of coal to India's energy security, it is necessary to give priority to a number of policy initiatives in the Twelfth Plan which can address obvious weaknesses:

1. Coal exploration must be stepped up to ensure availability of more coal mining blocks for both private and public sectors. Either CMPDIL ought to be made an independent organisation, or a new independent organisation should be created to develop and maintain the repository of all geological information in the country on the lines of CEA for power sector, or the DGH for petroleum and natural gas sector.
2. To expedite clearances, a coordination committee at the Centre and State level may be set up (single window concept), involving senior representation from the concerned departments for quick environment clearances. Even if statutory clearances can only be given by the relevant agency, the establishment of a coordinative mechanism will expedite the decision-making.
3. Enactment of a central legislation to ensure uniform R&R policy and speedy land acquisition on appropriate terms is absolutely necessary.
4. There is a need to incentivise coal availability from captive coal mining blocks. The decision to allocate all future coal blocks on the basis of transparent bidding should be implemented in the first year of the Twelfth Plan. Further, we must create an institutional mechanism for planning and development of common infra-structural facilities with participation of coal mining companies and the respective State Governments.
5. In several cases, development of captive coal may be in a position to produce coal in excess of their requirement. At present the terms of allocation of coal blocks do not permit sale to a third party except with permission. If they could be encouraged to produce more than their consumptive use it would avoid the need to import much more expensive imported coal. This will be done by making surplus coal available to CIL subsidiaries at a price which provides adequate incentive for the captive block owners. The principle on which such coal should be priced can be approved by the Cabinet.
6. Coal companies should develop a comprehensive plan for increasing the share of production from underground mines and suitable policy initiatives such as cost plus pricing, fiscal incentives and so on need to be introduced to improve the potential returns currently available from underground mining activities. It is suggested that the share of underground mining be increased from the existing 10 per cent to a considerable level by the end of the Twelfth Plan in the next five years.
7. In view of the availability of increased coal imports for the Twelfth Plan period the Ministry must ensure that mechanisms are in place which will be up and appropriate mix of long-term and spot contracts.
8. A coal sector regulator should be set up on a priority basis.
9. Finally it is not clear whether the present structure on which the operating coal companies are subsidiaries of CIL as the holding company is desirable. The industry would be better served if the subsidiaries were spun off as separate public sector companies encouraged to develop their own strategies of coal development including joint venture activity and acquisition of assets abroad. A High Level Committee should be appointed to examine this option and submit a report within six months.

Benchmarking of Productivity

14.148. The Twelfth Plan envisages an improvement in productivity per person from 4.92 tonnes per person in CIL to 7 tonnes per person and from 3.8 tonnes per person in SCCL to 4.93 tonnes per person. This will still leave India well below other producers, as countries like USA, Australia and China have productivity levels of about 14 tonnes per person for combined underground and opencast mines. The targets set to realise the productivity level mentioned above envisage productivity levels of 14.0 tonnes per person for CIL and 14.83 tonnes per person in SCCL in the terminal year of the Plan for opencast

operations, and only 1.10 and 1.83 tonnes per person for CIL and SCCL, respectively for underground operations. Thrust would be given on improvement of operational efficiency of the coal mining companies by establishing benchmarks for different mining operations and work force productivity comparable with international standard. The productivity norms of different heavy earth moving machinery (HEMM) benchmarked earlier for both availability and utilisation in different coal companies would be examined so that these become comparable with international standards.

3.4. PETROLEUM AND NATURAL GAS SECTOR

14.149. Managing the petroleum and natural gas sector will present critical challenges in the Twelfth Plan. The demand for petroleum products is expected to expand while the scope for increasing domestic production is limited. Oil prices in world markets are expected to be volatile but generally high. The oil and gas import bill is likely to be around 6–7 per cent of GDP during the year 2011–12. Unfortunately, domestic prices of certain petroleum products have not been adjusted in line with world prices, with the result that there is large ‘under-recovery’ by the oil sector. Important steps were taken in 2012 to adjust diesel prices and to put a limit on highly subsidised LPG, but even after these adjustments, under-recoveries remain large and the subsidy provided in the budget covers only a fraction of this. Continuing this scale of under-recovery is simply not viable. Prices of sensitive petroleum products like diesel, kerosene and LPG will therefore have to be adjusted periodically to reduce the under-recoveries which are currently borne by the Government and upstream oil companies. This is not consistent with developing a healthy petroleum sector capable of investing in exploration and production.

REVIEW OF THE ELEVENTH PLAN

Demand for Petroleum Products

14.150. Demand for petroleum products grew at an annual rate of 4.15 per cent during the Eleventh Plan period which is close to the upper-case scenario that was envisaged at the start of the Eleventh Plan as shown in Table 14.31. The elasticity of POL demand with GDP growth during the Eleventh Plan has been 0.53 which is slightly higher than 0.49 for the Tenth Plan. The use of FO/LSHS and LDO in power, fertiliser and general trade has declined. Also, increased availability of natural gas has replaced naphtha that was extensively used in the fertiliser industry. LPG consumption in India has increased from 10.85 million tonnes in the year 2006–07 to 15.36 million tonnes in the year 2011–12, growing at a rate of 7.21 per cent per annum CAGR.

Exploration, Production and Refining Sector

14.151. Both oil and gas production targets have slipped by large percentages during the Eleventh Plan period. Against the crude oil production target of 206.73 MMT in the Eleventh Plan, the actual achievement is only 177 MMT, that is, 14 per cent below the target. The actual natural gas production was 212.54 BCM as against the production target of 255.76 BCM, with a shortfall of about 17 per cent of the Eleventh Plan targets. The balance recoverable reserve position as on 1 April 2011 of O + OEG was about 2015 million tonnes, which has increased by 10.5 per cent from 1,847 million tonnes as on 1 April 2007.

14.152. In contrast to the large slippage in oil exploration and production, addition to refining capacity is likely to be 88.42 per cent of the target. Some of the refinery projects like MRPL expansion and Paradip refinery projects have also slipped into the Twelfth

TABLE 14.31
Consumption of Petroleum Products

Consumption		2007–08	2008–09	2009–10	2010–11	2011–12	CAGR (%)
Actual		128.95	133.6	137.81	141.75	147.98	4.15
Working Group	Base	116.35	119.1	121.99	126.97	131.77	2.93
Eleventh Plan	Upper	117.56	121.95	127.79	136.59	141.79	4.45

TABLE 14.32
Physical Performance of Petroleum and Natural Gas Sector

Sl. No.	Item	Eleventh Plan Target	Actual 2007-08	Actual 2008-09	Actual 2009-10	Actual 2010-11	Actual 2011-12	Total in the Eleventh Plan
1	Crude Oil Production (MMT)	206.73	34.12	33.51	33.69	37.68	38.09	177.09
2	ONGC	140.06	25.94	25.37	24.86	24.42	23.72	124.30
3	OIL	18.99	3.10	3.47	3.57	3.58	3.85	17.57
4	PVT. JVC	47.71	5.08	4.67	5.26	9.68	10.53	35.22
5	Gas Production (BCM)	255.76	32.42	32.85	47.50	52.22	47.56	212.54
6	ONGC	112.39	22.33	22.49	23.10	23.10	23.32	114.33
7	OIL	16.42	2.34	2.27	2.42	2.35	2.63	12.01
8	PVT. JVC	126.95	7.74	8.09	21.99	26.77	21.61	86.20
9	Refining Capacity (MMTPA)	240.96	148.97	177.97	185.39	193.39	213.07	213.07*
10	Hydrocarbon Reserve Accretion (O + OEG)	1,847	-	-	-	-	-	2,014.81#

* Refining Capacity estimate as on 1 April 2012. # HCRA as on 1 April 2011.

Plan due to delays in providing captive power equipment by BHEL to these refineries. Table 14.32 gives the target and achievements of various physical parameters during the Eleventh Plan period.

New Exploration Licensing Policy (NELP) Programme

14.153. The NELP programme is a major initiative aimed at attracting private investment into oil and natural gas. There have been nine rounds of bidding, starting with a first in 1998, and a total investment of US\$ 15.88 billion has been made by various operators in E&P sector till 2010-11. Out of 235 Production Sharing Contracts (PSCs), 73 were signed during the Eleventh Plan period. To step up the pace of

exploration, in the ninth round of NELP (NELP-IX), 34 exploration blocks were offered in October 2010, of which 18 PSCs have already been signed with the awardees. Details of blocks awarded under the nine NELP rounds are shown in Figure 14.1.

Equity Oil, Gas from Overseas Assets

14.154. Oil PSUs (OVL OIL, GAIL, IOCL, BPCL and HPCL) have invested ₹59,108 crore (US\$ 13 billion) up to 31 March 2011 on acquisition of assets abroad, mainly in oil producing assets. There are nine major production assets in Russia, Sudan, Brazil, Syria, Vietnam, Venezuela and Colombia. Production from overseas oil and gas blocks is presently about 10.22 per cent of India's domestic production. The

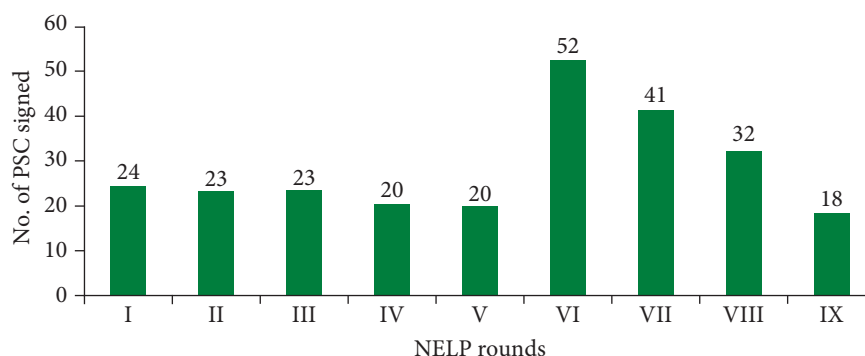


FIGURE 14.1: Exploration Blocks awarded in NELP Rounds

TABLE 14.33
Share of Overseas Hydrocarbon Production

Year	2007–08	2008–09	2009–10	2010–11	2011–12 #
Total Domestic oil and gas (MMTOE)	66.53	66.35	81.19	89.93	85.64
Overseas production of OVL (MMTOE)	8.8	8.78	8.87	9.43	8.75
Overseas production as a percentage of Domestic (%)	13.23	13.23	10.93	10.49	10.22

Source: Ministry of Petroleum and Natural Gas/ONGC Videsh Ltd. (#) Prov.

share of overseas vis-à-vis indigenous production of oil and gas is given in Table 14.33.

Policy Initiatives during the Eleventh Plan

14.155. Various policy initiatives were taken to address the issues relating to attaining hydrocarbon energy security. Major policy initiatives taken by the Government during the Eleventh Plan are as follows.

Regulatory Measures

14.156. The Government has set up Petroleum and Natural Gas Regulatory Board with effect from 1 October 2007 to regulate downstream activities of oil and gas sector under the PNGRB Act, 2006. However, the mandate of PNGRB is fairly narrow and deals largely with pipelines. PNGRB is currently empowered to give authorisation to entities for laying, building, operating and expanding any pipeline as common or contract carrier and expanding city gas distribution projects.

Allocation of Natural Gas

14.157. Natural gas produced from NELP blocks is subject to Government-prescribed allocation to different uses and also Government approval of the pricing formula. The Government has prioritised allocation of gas produced from NELP blocks in the following order:

- Fertiliser plants producing subsidised fertilisers
- LPG plants
- Power plants
- City Gas Distribution (CGD) for CNG and domestic PNG
- Steel, petrochemicals, refinery, captive power plants and CGD for industrial and commercial customers

14.158. An Empowered Group of Ministers has allocated 93.336 MMSCMD of gas on a combination of firm and fallback basis from the blocks producing gas under NELP.

Strategic Storage of Crude Oil

14.159. The Government is in the process of creating strategic crude oil storage capacity for 15 days at Vishakhapatnam (1.33 million tonnes), Mangalore (1.50 million tonnes) and Padur (2.5 million tonnes) through a Special Purpose Vehicle, namely, Indian Strategic Petroleum Reserve Ltd. (ISPRL). The storage would be further upgraded at other suitable locations by an incremental capacity of 12.5 million tonnes during the Twelfth Plan period.

Promoting Bio-Fuels

14.160. A programme of 5 per cent blending of ethanol with petrol is already underway with effect from November 2006 targeting 20 States and 4 UTs. Subject to availability, the percentage of blend can be enhanced to 10 per cent as specification for petrol with 10 per cent ethanol blend is already given by the BIS. At present, the EBP Programme is successfully running in 14 States and three UTs; OMCs have been able to contract 55.87 crore litres of ethanol against the requirement of 105 crore litres of ethanol for 5 per cent blending in the entire notified area.

Pricing of Petroleum Products

14.161. In 2002, the Government dismantled the Administered Pricing Mechanism, and announced that prices of all petroleum products would be deregulated. This decision, however, was not fully implemented after the prices of crude oil in international market rose sharply leading to increase in international prices of petrol, diesel, LPG and kerosene.

On 25 June 2010 the Government announced that the price of petrol was fully deregulated and the oil companies were free to fix it periodically. However, diesel price deregulation was deferred to be implemented later. Prices of LPG and kerosene remained under price regulation by the Government. The continuance of price control reflects the political sensitivity of the issue despite the evident economic desirability of implementing the Integrated Energy Policy.

14.162. The under-recovery by oil companies because of the inability to adjust oil prices is shown in Table 14.34. The amount of under-recoveries on sensitive petroleum products was ₹1,38,541 crores (excluding the under-recoveries of ₹4,890 crores incurred by OMCs on sale of petrol) in the year 2011–12 including the under-recoveries incurred by OMCs on petrol. The total under-recoveries by the Government and oil PSUs amount to ₹4,43,197 crore during the Eleventh Plan period. That has seriously affected the profitability and viability of the oil marketing companies. The under-recoveries of the oil companies in 2012–13 will rise to ₹1,52,937 crore as per Refinery Gate price effective from 1 July 2012 if prices are not adjusted.

Pricing of Natural Gas

14.163. Gas price for NELP Blocks is supposed to be determined through an arm's length process by contractor, and is subject to approval by the Government. Accordingly the price of RIL KG Basin gas was fixed at \$4.2/MMBTU ex-Kakinada in 2007 by EGoM and the price was expected to be valid till March 2014. The purchase price of

long-term LNG imported from Qatar for Petronet LNG has been linked to Japanese Crude Cocktail (JCC) and varies on a monthly basis. It is sold at prices fixed by resellers. Spot RLNG prices are based on market conditions, which are currently hovering around US\$12–13/MMBTU. Following the fixation of the KG basin gas price at US\$4.2 per MMBTU, the administered price of gas from nominated fields awarded earlier to ONGC/OIL, which varied depending on the field, were raised to US\$4.2 per MMBTU, except for the North-East where it is US\$2.52 per MMBTU.

14.164. The NELP of the Government of India provides freedom to price the gas by the operator at a market-determined price for gas produced from the NELP blocks, subject to the Government approving the pricing formula. However, questions have arisen regarding the interpretation of various clauses in the existing contracts. There is a need to review the provision of pricing under PSC to clarify the extent to which producers will have the freedom to market the gas. Clarity is obviously essential if we are to attract private investment into exploration and production. Legally, gas as a resource belongs to the Government and the Government has the right to fix an appropriate price. However, if the intention is to attract private investment into this sector, the Government should state clearly what degree of pricing freedom will be given. Ideally, private investors would expect freedom to price the gas at a level at which there are willing buyers, which in turn will be determined by the price at which consumers can import. On the other hand, the CBM policy envisages a different contractual regime. In order to encourage this

TABLE 14.34
Under-Recoveries on Petroleum Products

Petroleum Products	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Petrol	2,027	7,332	5,181	5,151	2,227	–
Diesel	18,776	35,166	52,286	9,279	34,706	81,192
Domestic LPG	10,701	15,523	17,600	14,257	21,772	29,997
PDS Kerosene	17,883	19,102	28,225	17,364	19,484	27,352
Total	49,387	77,123	1,03,292	46,051	78,190	1,38,541

Source: PPAC.

emerging source of gas, its pricing should be left to the market without the need for Government approval.

14.165. There are a number of other issues regarding existing PSC. First, questions have been raised regarding investment multiple which determines the profit share of Government and the investor after allowing recovery of investment cost. It has been argued that this incentivises greater capital intensiveness, and a stronger profit share based on production would be better. This assessment needs to be weighed against the argument that the IM enables Government to insulate the contractor at higher levels of investment, which increases the possibility of oil/gas being discovered. There are also concerns on the need to improve the provisions under the PSC to make them more transparent and also fully safeguard the interests of the stakeholders. Second, the existing management system has not led to an effective supervision over the projects. There is a need to consider alternate mechanisms. Several other issues have been raised also. Government has, therefore, appointed a Committee under the chairmanship of Dr. C. Rangarajan, Chairman, Economic Advisory Council to the Prime Minister to review existing PSCs and recommend changes for the future.

14.166. Finally, the Twelfth Plan is likely to see a continuation of high oil and gas prices in the world markets and our dependence on imports for both oil and gas is also likely to increase. There is an urgent need to align domestic oil and gas price to market price for sound development of the sector and to send the right signals to consumers and producers. This would also enable the oil PSUs to generate internal resources to fund new projects and create growth momentum. Price reform along these lines would also permit entry of private companies for marketing of petroleum products which would help expand competition. Price adjustment in the petroleum sector has to be carried out keeping in mind the need for ensuring affordability for the poor and vulnerable sections. This can be done in various ways. It does not require generalised subsidies.

TWELFTH PLAN STRATEGY

Demand of Petroleum Products

14.167. Demand of petroleum products is projected to increase at an annual rate of 4.7 per cent during the Twelfth Five Year Plan. This will increase consumption of POL products from 147.98 MMT in 2011–12 to 186.21 MMT by 2016–17. The demand for diesel will continue to be dominant followed by MS and LPG. The demand estimates of petroleum products in Twelfth Plan period are given in Table 14.35.

Supply of Petroleum Products

14.168. Oil production during Twelfth Plan is likely to increase marginally and then decline by 3.26 per cent by the end of the Plan. As a result, import dependence in petroleum products is expected to increase from 76.6 per cent at the end of the Eleventh Plan to 77.8 per cent by the end of the Twelfth Plan. The crude oil production profile for the Twelfth Plan, based on established reserves, present status of different fields, input implementation schedules and the health of reservoirs is as given in Table 14.36.

Natural Gas Demand

14.169. The demand of natural gas during the Twelfth Plan is likely to grow by about 19.2 per cent to meet the incremental requirement of power, fertiliser and other industries. The CNG and city gas sector will also see a quantum growth in natural gas use. It is expected that by the end of the Twelfth Plan about 300 cities are likely to be covered under city gas distribution. Yearly estimates of natural gas demand are given in Table 14.37.

Natural Gas Production

14.170. Domestic production of natural gas during the Twelfth Plan will depend upon the output from gas fields discovered under NELP by various operators. As majority of new gas prospects are in deep water, the investments, technology and pricing of gas for developing these fields would be important. The estimated gas production by different operators has been given in Table 14.38. However, the projected production from Private/JV producers may need to be reviewed during the Plan period, as

TABLE 14.35
Demand of Petroleum Products

Products	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (%)
1. Petroleum Products ('000MT)							
LPG	15,358	16,986	18,363	19,675	20,857	21,831	7.3
MS	14,993	16,091	17,527	19,083	20,766	22,588	8.5
NAPHTHA/NGL	11,105	12,353	11,417	11,417	11,022	11,022	-0.1
ATF	5,536	6,009	6,587	7,202	7,849	8,540	9.1
SKO	8,229	7,949	7,631	7,326	7,033	6,751	-3.9
HSDO	64,742	65,040	68,654	72,589	76,904	81,599	4.7
LDO	415	400	400	400	400	400	-0.7
LUBES	2,745	2,691	2,772	2,857	2,945	3,036	2.0
FO/LSHS	9,232	7,954	7,902	7,899	7,872	7,872	-3.1
BITUMEN	4,628	5,254	5,541	5,732	5,971	6,114	5.7
PET COKE	6,145	6,765	7,514	8,345	9,268	10,294	10.9
OTHERS	4,869	5,445	6,127	6,109	6,085	6,162	4.8
Total POL	1,47,997	1,52,937	1,60,436	1,68,635	1,76,972	1,86,209	4.7

Source: Ministry of Petroleum and Natural Gas.

TABLE 14.36
Projection of Crude Oil Production in the Twelfth Plan

	2012-13	2013-14	2014-15	2015-16	2016-17	Total
ONGC	25.045	28.27	28.002	26.286	25.456	133.059
OIL	3.92	4.00	4.06	4.16	4.20	20.34
Pvt./JV	13.34	13.30	12.70	12.10	11.50	62.94
Total	42.305	45.57	44.762	42.546	41.156	216.339

(in MMTPA)

Source: Ministry of Petroleum and Natural Gas.

TABLE 14.37
Natural Gas Demand for Twelfth Five Year Plan

Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	CAGR (%)
Power*	91	135	153	171	189	207	17.9
Fertiliser**	43	55	61	106	106	106	19.8
<i>Demand(Price Elastic) - Sub Total</i>	134	190	214	277	295	313	18.5
City Gas	13	15	19	24	39	46	28.8
Industrial	16	20	20	22	25	27	11.0
Petrochemicals / Refineries/Internal Consumption	25	54	61	67	72	72	23.6
Sponge Iron/Steel	6	7	8	8	8	8	5.9
<i>Demand (Relatively price Inelastic) - Sub Total</i>	60	96	108	121	144	153	20.6
Grand Total Demand	194	286	322	398	439	466	19.2

(in MMSCMD)

Source: *Ministry of Power, **Ministry of Fertilizers.

TABLE 14.38
Projection of Natural gas production in Twelfth Plan (BCM)

	2012–13	2013–14	2014–15	2015–16	2016–17	Total
ONGC	25.266	25.472	26.669	28.215	38.676	144.298
OIL	3.30	3.80	4.00	4.27	4.45	19.82
Pvt./JV	23.71	32.38	39.4	40.43	41.46	177.38
Total	52.276	61.652	70.069	72.915	84.586	341.498
Total MMSCMD	143.22	168.91	191.97	199.77	231.74	187.12 (Average)

Source: Ministry of Petroleum and Natural Gas.

the production profile from their exploration acreage gets approved by the Directorate General of Hydrocarbons.

Exploration Activities

14.171. During the Twelfth Plan period, 13,8974 kilometres of 2D seismic and 82,488 square km of 3D seismic are likely to be acquired by ONGC, OIL and private/JV companies. Also, 1,310 exploratory wells are likely to be drilled during the Twelfth Plan period. These exploratory efforts are likely to result in hydrocarbon reserve accretion of about 727 million metric tonnes of oil and oil equivalent gas in the country. The break-up of exploration programme by ONGC, OIL and Private/Joint Venture companies is given in Table 14.39. The role of DGH as the upstream advisor and supervisor for the Government is very important. Efforts will be made to increase the capacity of the DGH, as also efficiency in decision-making. It can play an important role in obtaining various clearances for the upstream operators from multiple agencies of the Government. This has to be viewed particularly in the light of the fact that a large

number of discoveries made under NELP are yet to be appraised and developed. The DGH needs to monitor their evaluation and development quickly.

Pricing and Under Recoveries of Petroleum Products

14.172. Although important steps have been taken in the first year of the Twelfth Plan to adjust diesel prices and to cap the subsidy on LPG, this has not eliminated the under-recovery of oil companies. The increase in under-recoveries of OMCs is adversely affecting the financial position of OMCs and may affect mobilisation of funds for new projects during the Twelfth Plan period. Currently, the under-recoveries of OMCs are compensated by the Government from fiscal budget, discount on crude and products by upstream oil companies and part absorption by OMCs. The OMCs are expected to incur under-recoveries of ₹8,32,737 crore during Twelfth Plan period. If no further adjustment occurs, and if global prices stay at present level, the total under-recovery in the Twelfth Plan period will be over ₹8.32 lakh crore which is simply not viable (Table 14.40)

TABLE 14.39
Breakup of the Exploration Programme for the Twelfth Plan

Activity	Unit	ONGC	OIL	Private/JV	Total
Seismic Surveys 2D	km	28,170	6,850	1,03,954	1,38,974
Seismic Surveys 3D	Sq Km	24,163	8,364	49,961	82,488
Exploratory Wells	Nos	611	174	525	1,310
Reserves Accretion IIIH	MMTOE	1,080	78.14	728	1,886.14
Ultimate Hydrocarbon Reserve Accretion	MMTOE	360	26	341	727

Source: Ministry of Petroleum and Natural Gas.

TABLE 14.40
Likely Under-Recoveries on Petroleum* Products

	(₹ Crore)					
Sensitive Petroleum Products	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Diesel	86,910	90,820	95,053	99,673	1,04,664	4,77,120
PDS Kerosene	28,880	27,725	26,617	25,552	24,528	1,33,301
Domestic LPG	38,182	42,054	44,931	47,531	49,618	2,22,316
Total	1,53,973	1,60,598	1,66,601	1,72,756	1,78,810	8,32,737

* Price of Petrol is made market determined. It assumes oil prices at US\$ 100 per barrel with exchange rate of US\$ = ₹55.

Addition to Refining Capacity

14.173. With grass-roots refineries at Bhatinda (9 MMTPA), Paradip (15 MMTPA) and expansion of some of the existing refineries, the total refining capacity is projected to be around 218.37 MMTPA by the year 2012-13 and is expected to touch 313.57 MMTPA by the end of the Twelfth Plan as shown in Table 14.41. Majority of new refining capacity would be added from expansion of existing refineries at low costs.

Alternate Sources of Hydrocarbons

14.174. The development of alternate sources of hydrocarbons such as coal bed methane, gas hydrate, shale gas, oil shale and so on are some of the areas which require greater attention. Oil companies would also need to focus on development of renewable energy sources including biodiesel, ethanol, wind, solar, biomass and so on to make the hydrocarbon use for various activities carbon neutral by the companies.

TABLE 14.41
Projected Refining Capacity during Twelfth Plan (MMTPA)

	2012-13	2013-14	2014-15	2015-16	2016-17
IOC	54.2	69.2	69.2	74.0	77.0
BPC (Mumbai)	12.0	12.0	13.5	13.5	13.5
Kochi	9.5	9.5	9.5	15.5	15.5
BORL-Bina	6.0	6.0	7.2	7.2	9.0
HPC (MR + VR)	16.5	17.2	17.2	17.2	23.2
Maharashtra Refinery	0.0	0.0	0.0	0.0	9.0
HMEL (GGSRL)	9	9	9	9	9
MRPL	15	15.5	16	16.5	18
ONGC (Tatipaka)	0.066	0.066	0.066	0.066	0.066
CPCL	12.1	12.1	12.1	12.1	18.3
NRL	3	3	3	3	8
Sub Total PSU	137.4	153.6	156.8	168.1	200.6
RIL-DTA and SEZ, Jamnagar	60	60	60	60	60
EOL, Jamnagar	19	20	20	30.8	38
NOCL, Cuddalore	2	6	6	6.1	15
Sub Total Private	81	86	86	96.9	113
Total	218.4	239.6	242.8	265.0	313.6

Source: Ministry of Petroleum and Natural Gas.

Coal Bed Methane (CBM)

14.175. The prognosticated CBM resources in the country are about 92 trillion cubic feet (TCF), out of which only 8.92 TCF has so far been established. The Government of India has awarded 33 CBM exploration blocks. Commercial production of CBM has already commenced in Raniganj (South) in West Bengal. CBM production by the year 2016–17 is expected to be around 4 MMSCMD. This is quite low compared with the resource potential estimated by the DGH. In spite of the fact that more than a decade has lapsed since the award of CBM blocks, the evaluation and development continues to be behind schedule. Efforts are required to enhance the production of CBM through suitable policy measures. There are also delays in approving prices for CBM projects shortly to go into production. This needs to be expedited.

Simultaneous Operations of Coal Bed Methane (CBM) and Oil and Gas

14.176. At present there is no mechanism to work together simultaneously for the exploration and exploitation of coal, coal bed methane, shale gas and oil and gas production in same block/ acreages due to the fact that both coal and oil and gas sectors are governed by different administrative ministries. Regulations and Acts do create conflict of interest for the simultaneous exploration and exploitation of coal, CBM, coal mine methane and also underground Coal gasification along with coal and oil and gas. There is a need for the operators to work under similar contractual regime for simultaneous operations of CBM, Coal and shale gas and CBM, oil and gas and shale gas in the same area. A policy framework for this will need to be developed expeditiously in the year 2012–13 itself.

Shale Gas Exploration

14.177. The Government has initiated steps for development of shale oil and shale gas from on land sedimentary basins. MoU has been signed between Ministry of Petroleum and Natural Gas and Department of State, USA on 6 December 2010 for cooperation in resource assessment, regulatory framework, training and so on. A multi-organisation

team (MOT) has been constituted involving DGH, ONGC, OIL and GAIL for collection of required G&G, geochemical and petro-physical data for assessment of shale oil and shale gas prospects in Indian on land sedimentary basins. The involvement of private sector in this initiative will be enhanced as well. A policy of regulatory framework is to be put in place for shale oil and shale gas development.

Underground Coal Gasification (UCG)

14.178. ONGC has signed an Agreement of Collaboration (AOC) with Skochinsky Institute of Mining, Russia on 25 November 2004 for implementation of Underground Coal Gasification (UCG) project in India. The Vastan Mine block belonging to GIPCL in Surat district, Gujarat has been selected for UCG Pilot project. The total financial implication of the project is about US\$ 15.32 million. ONGC will be asked to complete this pilot at the earliest.

National Gas Hydrate Programme

14.179. An MoU was recently signed in the area of marine gas hydrate research and technology development between the Leibniz Institute of Marine Sciences, Germany and DGH for research on methane production from gas hydrate by carbon dioxide sequestration. The NGHP programme has also been going on for a long time, with no tangible results so far. Efforts will be made for better monitoring and conclusion of this programme at the earliest.

Flaring of Natural Gas

14.180. Currently about 3 per cent of gas produced is flared by the ONGC and Oil India Limited. The total volume of gas flared is estimated to be around 3.5–4.0 MMSCMD. There is a need to stop such flaring through use of this gas by the local industry and/or gathering it either through compression or by liquefaction mode and then re-injecting the gas into pipeline. A separate mechanism to reach a zero flaring of gas and its commercialisation can be developed to stop such wasteful flaring of gas.

Focus on Research and Development

14.181. The need to develop domestic capability in the exploration, production, refining and processing of oil and natural gas has led to the creation of R&D

institutes by oil sector organisations. While in-house institutions can make a significant contribution to the activities of their parent PSUs, they are not subjected to any peer review. They have also been unable to attract private sector business and have remained dependent on captive assignments. On the other hand, the existence of in-house institutions has restrained the PSUs from outsourcing their assignments to outside institutions/niche area experts. The objective should be to ensure that R&D centres of the oil sector PSUs develop into world class institutions, with induction of fresh capital and top scientific personnel.

14.182. Efforts will be intensified to obtain the latest technology from global centres of excellence while at the same time strengthening our own capability. Several alliances were signed with international organisations and Governments during the Tenth and the Eleventh Plan periods. Diplomatic efforts were also made through JWGs and other forms of MEA assistance to increase interaction between Indian and foreign experts. These efforts will be renewed, and fresh initiatives taken. Some of the key areas for R&D development to strengthen domestic capability are in exploration, geo-data processing and interpretation, drilling technology, reservoir

studies, ocean technology, oil and gas production technology, well logging technology, biotechnology and geotectonic, quality improvements of the products, improving energy efficiencies of various processes, and yield maximisation of distillation. The experience of Brazil in having developed scientific and technical know-how as well as manpower domestically, tailor-made to suit their geological requirements is a good example to follow.

14.183. Various oil and gas sector organisations plan to invest ₹6,326 crore during the Twelfth Plan period as R&D of oil and gas sector activities as indicated in Table 14.42. Some of the focus areas in oil and gas sector are:

1. Producing waxy crude
2. Smart horizontal well completions
3. 4D Seismic mapping
4. Long heated insulated pipeline for crude evacuation
5. Improving energy efficiency in refineries
6. Product yield maximisation
7. Exploration of unconventional energy resources, viz. shale gas, CBM, UCG and so on
8. Oil shale and study of gas hydrates in eastern and western offshore areas of India

TABLE 14.42
R&D Expenditure by Major Oil and Gas Companies

Company	2009-10 (Actual)		Eleventh Plan (Actual)	Twelfth Plan (Estimated)
	Expenditure ₹ crore	per cent of R&D expenditure/Revenues	Expenditure ₹ crore	Expenditure ₹ crore
Indian Oil	89.65	0.04	317.83	955
BPCL	26	0.02	155.38	429
HPCL	2.1	0	24.5	315
CPCL	0.3	0	7.4	14
RIL	41	0.02	1,640	2,000
EOL	-		12	25
ONGC	219.95	0.34	1,289.32	2,156
OIL	22.49	0.27	108.63	257
GAIL	16.17	0.06	17.23	71
EIL	11	0.54	46	104
Total	428.66	0.06	3,618.29	6,326

Source: Ministry of Petroleum and Natural Gas.

Infrastructure and Capacity Building

- The unlicensed offshore areas and Deccan basins are technologically challenging due to higher water depths and sub-basalt sediments, respectively. It is important to access latest technology from global centres of excellence to address the specific needs of these balance areas. The Government would endeavour to encourage technology alliances with our upstream companies, and also attract service industries to set up base in India.
- Strengthen and empower technical and scientific manpower for better decision-making and capacity-building in oil sector specifically the E&P companies. Deployment of large qualified workforce will be necessary during the Twelfth Plan for exploration and production sector.
- Both ONGC and OIL would step up efforts, to raise oil and gas production from the near stagnant levels of the past one decade or so. These companies ought to enhance production by reducing their R/P ratios. They would also be encouraged to quickly appraise their entire licensed areas to enhance reserves. In the offshore nominated areas, technology is likely to play an important role. The Government would also encourage them to induct cutting-edge technology in these acreages, often available only as in-house with global players, on risk-reward basis.
- The Integrated Energy Policy had laid down that there is a need for an independent upstream regulator. The Government needs to distance itself from routine contract administration, as well as capex/pricing decisions. As long as the Government itself is the upstream regulator, the reasoning that the DGH provides it technical advice does not lend it independence. Audit issues and contractor-Government conflicts may get much reduced if an independent regulator were to be put in place. Further, in order to make marginal offshore oil and gas discoveries viable, offshore infrastructure needs to be shared between operators. The DGH would issue regulations to encourage operators to collaborate on mutually beneficial terms.
- Development of strategic and commercial gas storages by the E&P and marketing companies to address price volatility, balancing of seasonal gas

requirement by various sectors at different locations in the country.

- Development of strategic crude oil storage beyond 5 MMTPA capacity. The Government would be open to private sector involvement in building and operating strategic storage, on the condition of the crude being available for release, at its discretion.
- Strategy for refining capacity additions considering current market situation
- Marketing and distribution infrastructure facilities for the petroleum products
- Additional development of new LNG import and regasification capacity both on the East and the West coasts of India.
- Gas Pipeline transportation infrastructure both on the East and the West coasts and also in southern and northern parts of the country for supply of gas throughout the country.
- Facilitating development of city gas distribution in about 300 identified cities in the country.
- Improving efficiency of operations of various oil and gas sector installations. Benchmarks for refineries, pipelines process plants, buildings and any other installations to be developed by all the organisations and to be monitored periodically.
- Develop capacity building for 5 MMTOE per year of energy from renewables and unconventional hydrocarbon resources. This is with an aim to become carbon neutral for oil sector companies.
- Developing LNG import capacity based on Floating Storage and Regasification units (FSRU) in coastal cities of the country which are not connected to gas pipelines to expedite the city gas supply.
- Deploy the CSR resources for creating health and education infrastructure. Help communities in creating opportunities for clean and sustainable energy supplies for cooking and lighting for better quality of life in areas of operations from CSR funds.

Reforms Required in the Oil and Gas Sector

14.184. Given the challenges in managing the oil and gas sector, it is necessary to focus on the agenda of critical reforms needed in this sector in the Twelfth Plan period. They are listed below:

- Eliminate the uncertainty that has arisen regarding gas pricing from NELP production sharing contracts by implementing a new design of contracts. The recommendations of the Rangarajan Committee may be an important input in finalising this policy. Appropriate steps should be taken to resolve conflicts in existing contracts where interpretation of the contract terms is open to multiple options.
- Operationalise a road map to move petroleum product prices received by marketing companies to prices aligned with global prices. This may not be possible immediately, but it can be achieved by the end of the Twelfth Plan for diesel and petrol.
- Phasing out subsidies on domestic LPG and PDS kerosene. Subsidised LPG is now capped at nine cylinders per household with the rest being available at market price. Consideration should be given to converting the subsidised supply to an equivalent cash transfer targeted to those who need it.
- Kerosene supplies can be progressively reduced considering improved electricity access provided under RGGVY and LPG connections provided in rural areas.
- Rationalise tax structure in sales of petroleum products considering thermal value for its use in transport, industry, power, households and other sectors. Unified State taxes and removal of tax anomalies for efficient use of petroleum products.
- Incentivise exploration and production of domestic non-conventional fuels like shale gas, CBM, coal mine methane, underground coal gasification and so on.
- Promote development and production of bio-fuels by the oil sector E&P and marketing companies at commercial level. Appropriate policy and integration issues facilitating bio-fuels development be provided by both the State and the Central Governments.
- Expand exploration and production of domestic oil and gas sources for which quick decision-making for awarding and development of NELP blocks is necessary.
- In order to attract efficient E&P companies globally to bid for our acreages, it is vital to provide seismic and other technical data of the acreages on offer. It is proposed that the entire unlicensed sedimentary area be surveyed, so that 100 per cent exploration coverage may be achieved during the Plan period.
- NELP was launched as a stopgap arrangement until a National Data Repository was ready to facilitate an all-year round acreage award policy. The Government will introduce an Open Acreage Licensing Policy so that the target of full exploration coverage by the end of Plan period may be achieved.
- Provide 'Declared Goods Status' for natural gas/LNG so that it is available at uniform price in most of the States.
- Natural gas prices charged to producers must also be determined by market forces. There is a need for clarity on fiscal incentives on exploration of natural gas under NELP. The concept of uniform gas price across consuming sectors also needs to be examined afresh as the desire to keep prices low for certain sectors tends to distort pricing; it is inconsistent with the principle that the price of gas will be determined by market forces.
- Develop a policy framework to exploit shale gas. It is proposed that a new policy for exploration and production of shale gas be launched, and acreage be speedily awarded during the Plan period.
- Coal mining leases acreages often have methane or even oil/gas deposits. Similarly, oil and gas lease/PSC acreages have the possibility of coal/methane production. The Government should put in place a policy for simultaneous exploitation of CBM, coal, coal mine methane, oil and gas in a unified manner wherever such resources are available.
- Acquisition of equity oil and gas abroad including conventional and shale gas assets.
- Contracting LNG imports both on long- and short-term basis considering market price affordability.

3.5. NEW AND RENEWABLE ENERGY

14.185. The need to increase total domestic energy production in order to reduce import dependence, combined with the need to move away from fossil fuels in the longer run in view of climate change considerations, points to the need for stronger efforts to increase the supply of energy from renewables.

All over the world, investment in renewable power sources has been increasing. India has been a late entrant into the field of renewable energy, but it is beginning to make rapid strides in this sector with an annual growth rate of 33 per cent in 2010 against the global growth rate of 26 per cent during the same period. It must be emphasised however that these increases are from a very low base since renewables at present account for about 1 per cent of the total commercial energy used. Nevertheless, it is important to make a start and to gain significant experience in this important sector keeping in mind its potential over the longer term.

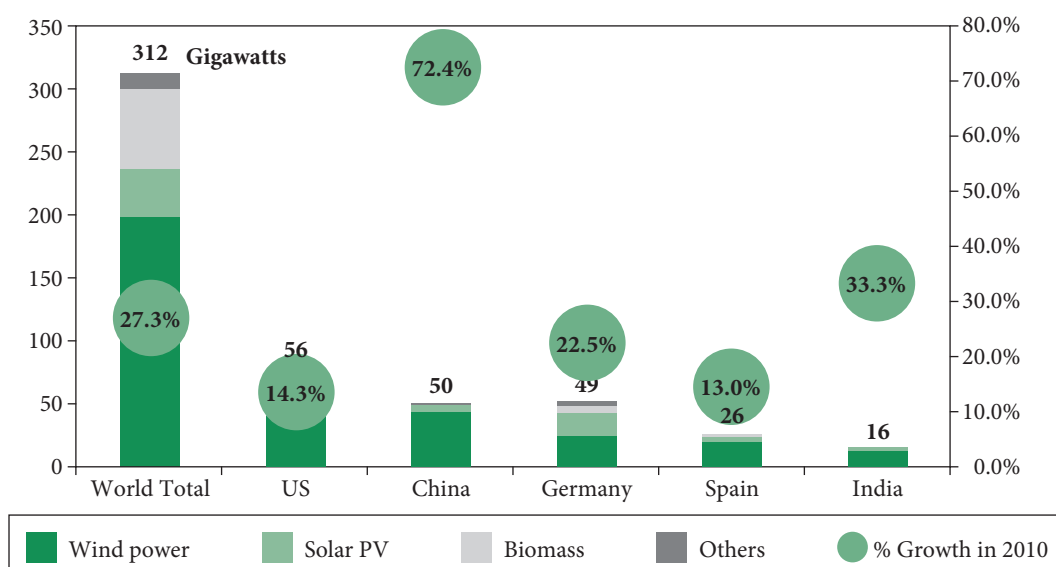
14.186. An important limitation on the extent to which we can shift to renewables is the high unit cost at present, compared with other conventional sources. However, unit costs of renewable energy, especially solar energy, are coming down and the marginal cost of conventional energy based on fossil fuels is likely to remain high and rise. These trends suggest that over the next 7 years the unit cost of energy from renewable sources such as wind and solar may come close to the unsubsidised cost of conventional energy. Since India has a large potential of both wind and solar energy, the exploitation of

this potential should form an important part of our long-term energy strategy.

14.187. The potential for renewable power has been revised upward over time. In the early 80s, India was estimated to have renewable energy potential of about 85 GW from commercially exploitable sources, viz. (i) Wind: 50 GW (at 50 m mast height) (ii) Small Hydro: 15 GW (iii) Bio-energy: 20 GW and (iv) solar radiation sufficient to generate 50 MW/sq. km using solar photovoltaic and solar thermal energy. These estimates have since been revised to reflect technological advancements. Initial estimates from Centre for Wind Energy Technology (C-WET) suggest that wind energy potential at 80 metres height (with 2 per cent land availability) would be over 100 GW. Some studies have estimated even higher potential ranges up to 300 GW. The MNRE has initiated an exercise for realistic reassessment of the wind power potential, whose results are expected by the end of 2013.

14.188. Some of the key issues facing renewable power generations are:

1. **Regional Concentration of Renewable Energy Potential:** Because renewable energy



* Excludes Hydro.

Source: REN21, Global Status Report, 2011.

FIGURE 14.2: Renewable Power Capacities, Top Five Countries, 2010

is location-specific and not evenly distributed there are problems on scaling up grid connected renewable power. For instance, wind potential is mainly confined to the wind resource rich States of Tamil Nadu, Maharashtra, Gujarat, Karnataka, Rajasthan, Andhra Pradesh and Madhya Pradesh. The States of Gujarat and Rajasthan have excellent solar radiation and the other suitable states for solar power are Andhra Pradesh, Tamil Nadu, Karnataka, Madhya Pradesh, Maharashtra, Orissa and so on. Similarly, small hydro power potential is mainly available with the Himalayan States and north-eastern States. The intermittent nature of Solar and Wind Power in the absence of an adequate balancing mechanism limits the flexibility of the State grid to absorb this power.

2. **Insufficiency and High Cost of Evacuation Infrastructure:** Utilisation of variable renewable energy requires a robust transmission infrastructure from remotely located generating plants to the load centres. Further, combining geographically dispersed renewable energy sources to reduce variability requires much larger, smarter and upgraded transmission network. A recent study conducted by the Power Grid Corporation Ltd. has identified the requirement for strengthening of both intra-state and interstate transmission system for facilitating transfer of renewable energy from renewable-energy-rich potential States to other States as well as for absorption within the host States. The study has estimated that for capacity addition plans for the Twelfth Five Year Plan period, an investment of around ₹30,000 crore would be required for creating renewable power transmission infrastructure.
3. **Regulatory Issues:** Renewable power, especially solar, is significantly costlier than conventional power, thus making its adoption by the cash-starved utilities difficult unless it is incentivised through Renewable Purchase Obligation (RPO) and introduction of Renewable Energy Certificate (REC). This would enable States to procure a fixed percentage of their power portfolio from renewable power.
4. **Financial Barriers:** Renewable energy technologies require large initial capital investments,

making the levelised cost of generation higher than it is for many conventional sources. These technologies need to be supported until technology breakthroughs and market volumes generated are able to bring the tariff down at the grid parity level. Moreover, high technology and project risks perceived by financiers for renewable projects make access to low-cost and long-term funding difficult. Thus, there is a need to generate instruments for low-cost and long-term financing of such projects from both domestic as well as overseas resources and also banks to adopt separate exposure limits for renewable energy sector.

5. **Low Penetration of Renewables for Urban and Industrial Applications:** Solar applications for heating water in urban, industrial and commercial applications is one of the most mature and viable renewable energy technologies available worldwide. Better market penetration of such technologies can lead to better demand side management for commercial as well as household usage. With already matured technology and rapidly growing industry, solar water heater installations have witnessed a massive growth throughout the world but the installations in India have remained low on account of poor adoption due to high upfront cost and poor quality standards of collectors. Moreover, the binding regulation in building codes that encourage adoption of such technologies are seldom implemented and only few States have such regulations.

REVIEW OF ELEVENTH PLAN

14.189. Progress in grid interactive renewable power generation capacity, especially of wind-based power was broadly in line with the targets of the Eleventh Plan. However, actual renewable energy generation has been substantially lower. Wind-based power generation has suffered the most partly also because of the lack of evacuation infrastructure in the resource rich States and partly because of lack of enforcing mechanisms and incentives for operational performance of the wind turbines. Incentives such as Accelerated Depreciation have not yielded the desired results and the recommendation now is to enforce generation-based incentive. Achievement

TABLE 14.43
Eleventh Plan Power Capacity Addition through Grid Interactive Renewable Power

Source	Target (MW)	Actual (MW) as on 31st March '2012
Wind	9,000	10,260.00
Small Hydro	1,400	1,419.17
Biomass Power	500	626.00
Waste to Energy	80	46.20
Bagasse Cogeneration	1,200	1,369.70
Solar Power	50	939.74
Total	12,230	14,660.81

Source: MNRE, GoI.

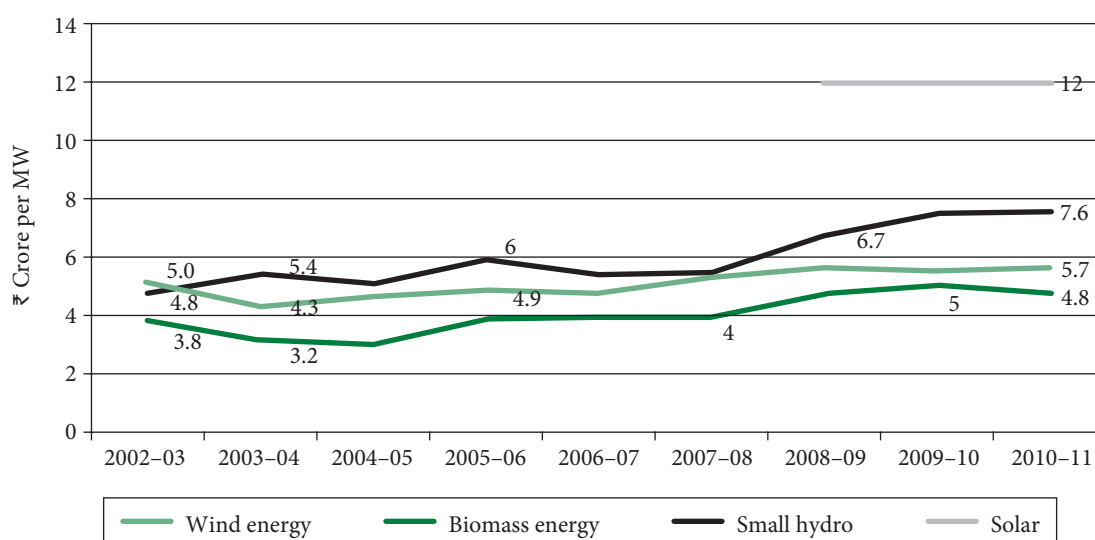
in capacity addition has been satisfactory for most sectors except in waste to power. The details of targets and achievements during the Eleventh Plan for grid interactive renewable power have been given in Table 14.43.

14.190. Solar and wind sectors have been facing following key challenges:

1. Globally, development of storage technologies has not been in line with the technology developments in wind and solar, due to which capacity utilisation of grid connected solar and wind has been relatively poor.

2. Though most of the States have come up with the RPO obligation, proper enforcement and monitoring is an issue.

14.191. Although private investments in wind power have increased, technological improvements and economies of scale have not reduced the costs in the industry. On the contrary, the cost per MW of wind power has increased from ₹4.3 crore/MW in FY 2003–04 to ₹5.7 crore/MW in FY 2010–11 (Figure 14.3). Rising land acquisition costs and turn-key project approach has resulted in the increase of project cost. Small hydro power, in spite of using mature and indigenous technology, has witnessed



Source: MNRE.

FIGURE 14.3: Cost of Renewable Energy Technologies Per MW

the same trend partly because of the rise in land costs and partly because of costs associated with delays for obtaining clearances for the sites where project development is difficult.

14.192. The cost of renewable power as against various sources of renewable energy is given in Table 14.44. The cost of wind power is already quite competitive. Solar power is much more expensive but costs are coming down. At the time of selection of the first batch in the Jawaharlal Nehru National Solar Mission (JNNUSM) the tariff for solar P.V. was ₹17.91 per Kwh and for solar thermal it was ₹15.31 per unit. In Batch II the tariff has come down to ₹8.77 per unit for solar P.V. Thus, although renewable power sources are significantly costlier than conventional power, the costs are clearly declining and over the next 5–10 years renewable energy may well be fully in line with the cost of new electricity capacity based on conventional energy sources if no subsidy is involved.

TABLE 14.44
Cost of Power for Various Renewable Energy Sources

Source	Estimated initial capital cost (₹ in crore/MW)	Estimated cost of electricity generation (Financial) (₹/kWh)
Small Hydro Power	5.50–7.70	3.54–4.88
Wind Power	5.75	3.73–5.96
Biomass Power	4.0–4.45	5.12–5.83
Bagasse Cogeneration	4.20	4.61–5.73
Solar Power	10.00–13.00	10.39–12.46

Source: CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 dated 27 March 2012.

Off-Grid Renewable Power

14.193. Off-grid renewable sector has the advantage that it is potentially much more competitive with conventional power because it avoids the investment in transmission to remote locations. Off-grid renewable power has made progress during the Eleventh Plan, but lack of scalable business models and non-availability of institutional finances have stalled the pace of its progress. Policy interventions are required to incentivise creation of financeable business models like rice husk gasifiers based electricity

generation. The issue of unwillingness of public sector banks to finance small scale off grid renewable based business models need to be addressed. The detailed overview of targets and achievements for the Eleventh Plan for off-grid renewable power has been given in Table 14.45.

TABLE 14.45
Power Capacity Addition through Off Grid Renewable Power

Source	Target (MW)	Actual (MW)
Waste to Power (Urban + Industrial)	58.00	85.15
Non-bag Cogen	255.00	336.59
Gasifiers	67.00	63.23
Acro-Gens/Hybrid Systems	1.75	1.14
SPV Systems	20	46.64
Total	401.75	532.75

Source: MNRE.

14.194. Progress of the scheme for electrification of remote villages/hamlets through renewable generation has not been satisfactory. Only 57 per cent of the targeted villages have been electrified so far. Initially no target was fixed for the grid solar photovoltaic system during the Eleventh Plan. Under National Action Plan on Climate Change, Jawaharlal Nehru National Solar Mission was launched which aims to install 20GW solar power, 2 GW of off-grid Solar, 20 million sq. metre of solar thermal collector area and 20 million rural households to have solar lighting by 2022. Under off grid solar application scheme of Jawaharlal Nehru National solar Mission, a total target of 100 MW of solar photovoltaic system and power plants for sanctioning was fixed for 2010–11 and 2011–12. Against this the ministry sanctioned projects aggregating to 118.07 MWp. During the Eleventh Plan SPV systems of standalone power projects aggregating to 46.64 MWp capacity were installed against a target of 20 MWp.

14.195. Another thrust area for the Eleventh Plan was 'optimizing energy plantations by raising plants on degraded forest and community land'. A detailed analysis for availability of wasteland in India was carried out based on the information available. IISc,

TABLE 14.46
Eleventh Plan Financial Allocations and Expenditure: MNRE

Programme Component	(₹ in crores)	
	BE	Expenditure
Grid-connected and Distributed Renewable Power	1,779	1,839.82
Renewable Energy for Rural Applications	910	910.95
Renewable Energy for Urban, Industrial and Commercial Applications	216	147.28
Research, Design and Development in Renewable Energy	481	340.33
Supporting Programmes	682	559.98
Total	4,068	3,798.36

Bangalore has estimated the waste land available in the country. Suitability of those areas for high yielding plantation and for Juliflora plantation has been estimated but policy models along with implementation guidelines to promote energy plantations have to be worked out.

14.196. The approved outlay for the Eleventh Plan for New and Renewable Energy programmes was ₹10,598.31 crore comprising of GBS of ₹4,068 crore and ₹6,530.13 crore of IEER. The likely expenditure at the end of Eleventh Plan is ₹3,798.36 crore (Table 14.46).

TWELFTH PLAN STRATEGY

14.197. Renewable energy has to play an expanding role in achieving energy security and access in the years ahead. The areas on which attention should be focussed during the Twelfth Plan are:

- Grid interactive and off-Grid/Distributed Renewable Power
- Renewable Energy for Rural Application
- Renewable Energy for Urban, Industrial and Commercial Applications
- Research, Design and Development for New and Renewable Energy
- Strengthening of Institutional Mechanism for enhanced deployment and creation of public awareness.

14.198. The National Action Plan for Climate Change (NAPCC) norms envisage that the share of renewable electricity in the electricity mix which was 7 per cent in 2011–12 should reach 12 per cent

by 2016–17. For this the corresponding renewable power requirement would be 132 BU or 52,000 MW considering the conservative average capacity utilisation factor of 30 per cent. The present installed capacity of renewable power is around 25,000 MW and, consequently, the renewable power capacity addition required for the Twelfth plan would be about 30,000 MW. The component wise break up of physical targets for the Twelfth Plan is given in Annexure 14.4.

14.199. For the Twelfth Five Year Plan, in addition to reorienting various existing policy initiatives, several new measures have been identified that are deemed essential to accelerate the pace of deployment of renewable energy in the country.

Schemes Spilling from the Eleventh Plan

Grid Connected Renewable Power

14.200. A capacity addition of 30,000 MW of Grid connected renewable power is proposed of which 15,000 MW is envisaged to come from wind power, 10,000 MW from solar capacity and 5,000 MW from other types of renewable sources. Institutional mechanisms to accelerate adoption of Renewable Power by States in the form of RPOs are sought to be enforced by bringing in an amendment into the Electricity Act, 2003. Accelerated depreciation benefit for wind power projects will come to an end at the end of the Eleventh five year plan. Tariff for Solar power under JNNSM is expected to continue falling due to enhanced indigenisation and local manufacturing. Further, to ensure volumes GBI support will be continued in the Twelfth Five Year Plan. It is also

proposed to restrict the upfront subsidy support for Small Hydro plants to 10 MW size of hydro plants from an existing size of 25 MW.

Off-Grid Distributed Renewable Power

14.201. An ambitious capacity addition target of 3,400 MW has been proposed, which is almost five times the targets of the Eleventh Plan for off-grid renewables. Cogeneration in non-bagasse industry is supposed to contribute maximum (2,000 MW) of the overall ambitious targets proposed by MNRE. 1,000 MW of off-grid solar capacity addition has been proposed in line with the targets of phase-2 of Jawaharlal Nehru Solar Mission. The financing for incentives for such projects would be sourced from a pool of funds originating out of National Clean Energy Fund, CSR activities and tax-free donations.

Renewable Energy for Rural Applications for Cooking

14.202. The biogas technology has now reached a stage of becoming robust and mature enough for meeting cooking energy needs with additional advantages of meeting good organic fertiliser needs for sustaining crop yield and productivity and soil health. It is recommended to continue biogas and solar cooker program. Additionally solar cooking could be promoted under mid-day meal programme.

Renewable Energy for Rural Electricity Access

14.203. Some of the existing models for providing off grid electrification have shown notable response. Consequently, models like Solar home lighting systems through banking system, entrepreneur based biomass gasifier models for providing electricity for lighting, and mini micro hydro systems would continue to be supported.

14.204. Renewable energy has to be seen as a complementary option to the current conventional power generation and it has special characteristics in terms of variability in availability. Solar power is available only during the day and the availability of wind power varies depending upon the time of the year and also intra-day depending on wind conditions. These characteristics imply some special efforts at balancing with other sources to ensure a reliable supply to the grid. Fortunately solar power

is at its peak precisely when demand is highest. However, that may not be the case with wind power. Effective utilisation of such power will require focused efforts towards balancing wind power with other power capacity which can be moderated to stabilise supply and also the development of efficient storage technologies. For this reason, special emphasis needs to be given on pumped water storage hydro plants. Central Government may consider providing assistance to the states for creating spinning reserve at the regional level by setting up of storage technologies. In the long term, other hybrid technology options such as gas with solar/wind, which are at a nascent stage, need to be developed. As the cost of power through conventional generation rise in the long term and technological developments in future increase the commercial viability of hybrid options, the cumulative financial benefits realised from using these options to meet peak demand requirements would outweigh the financial push provided to them in the present scenario.

Off Grid Solution for Industrial, Commercial and Buildings Applications

14.205. Existing scheme on solar water heaters will continue with a review of capital subsidy. Additionally green building programme and solar city initiative will be expanded to add new cities.

Major New Initiatives

14.206. The following are some of the new initiatives in the area of renewable energy:

1. **National Institute of Solar Energy:** The existing Solar Energy Centre would be converted into an autonomous institution for undertaking applied research, demonstration and development in solar energy including solar hybrid areas.
2. **National Bioenergy Corporation of India:** National Bio Energy Corporation of India (NBECI) will be set up to implement bioenergy mission including cook stove programme.
3. **Renewable Energy Development Fund:** In order to address the financing constraints for the grid connected as well as the off-grid applications of renewables, it is proposed to create a Renewable Energy Development fund. The fund will plug the gap between the sector financing needs and

the amount that falls short of the banks' obligations to their lending to this priority sector.

4. **National Bioenergy Mission:** Biomass energy for electricity generation has turned out to be one of the most attractive source of power which is scalable, has the largest potential for improving energy access and which can be linked to generating additional rural income. In view of the success of such biomass-based off-grid renewable models in rural areas of Bihar, it is proposed to launch the Biomass Mission with an objective to create a policy framework for attracting investment and to facilitate rapid development of commercial biomass energy market based on utilisation of surplus agro-residues and development of energy plantations.
5. **Renewable Power Evacuation Infrastructure:** Special emphasis will be placed on creating evacuation infrastructure and transmission facilities for renewable power in a time-bound manner to support the large expansion in consumption and production of renewable power. Judicious planning of transmission system, that is, creating pooling substation for cluster of renewable power generators and connecting them with receiving station of STU/CTU at appropriate voltage level, will lead to optimal utilisation of transmission system.
6. **National Biomass Cook Stove Programme:** The proposed initiative plans to universalise access of improved biomass cook stoves by providing assistance in exploring a range of technology deployments, biomass processing and delivery models leveraging public-private partnerships.

Policy Approach

14.207. The logic of subsidising new initiatives is that once they gain criticality of mass in terms of manufacturing capacity they should be able to survive without receiving any subsidy or fiscal incentives from the government. In keeping with this approach the objective should be to move away to the extent possible from capital subsidies and fiscal incentives to performance based incentives. Attaining the proposed higher deployment levels for wind energy, GBI support will require to be continued during the Twelfth Plan period.

14.208. To ensure lowest cost procurement of renewable energy, particularly wind and solar power should be through an open competitive bidding process. This has proved successful and in line with the ultimate objective of reaching grid parity earlier. This is particularly true of solar, which is at present costly, however it is expected to achieve grid parity in the Thirteenth Plan period in conjunction with the objectives of JNNSM. The competitive bidding process adopted for selection of projects has already resulted in significant reductions in base tariffs notified by CERC. The tariff for solar energy is expected to continue falling due to technological development and focus on indigenisation and local manufacturing for future projects, thus paving way to grid parity in due course of time.

14.209. There is a need to create a special sectoral exposure limit for the renewable energy sector by the banks. Additionally, creation of special instruments like tax-free RE bonds on the line of infrastructure bonds would facilitate low cost and long term lending to the renewable sector. Priority-sector status may also be granted to the renewable sector in view of the social and environmental benefits of the projects. This will act as a major policy push for the off-grid applications, which face maximum barriers in receiving low cost finances.

14.210. India's strategic focus would need to be augmenting of decentralised renewable energy capacity in the rural areas where it is having large social impact. Off-grid renewable energy applications have significant potential of reducing furnace oil/diesel/kerosene consumption in the country and can significantly contribute to oil import substitution. A cluster based approach for village electrification needs to be adopted. Under this approach, tariff-based bidding mechanism for such clusters inviting participation from business models would bring down the tariff by a significant amount. The difference that the consumers in the clusters are willing to pay and tariff discovered through the bidding mechanism can be financed through annual viability gap funding. The choice of technology can be left to the entrepreneurs, which would

encourage entrepreneurs to constantly innovate their products and services to bring down the cost of producing electricity. Such projects would also be encouraged in the areas with grid availability but with lack of reliable supply so that power can be fed into the grid when the grid is energised and can be supplied to households when the grid is down. However, proper regulatory framework needs to be developed which can be adopted at state level, and has clear cut guidelines on monitoring, evaluation, multi-year operation and maintenance and ensures grid compatibility for such projects. Moreover, a sufficient financing mechanism for meeting out the viability gap requirement and an institutional mechanism to create an ecosystem for deployment of such projects needs to be put into place.

14.211. India is the second largest wind turbine manufacturer next to China. The installed manufacturing capacity in India ranges around 6,000 MW per year, with large export potential. The manufacturing base for wind turbines and its components has expanded to 16 manufacturers with 43 models of varying technologies and capacities. Till the year 2000, most of the machines were of 500 kW or lower capacity. Today, there are about 14 models from 5 different manufacturers of capacity 2 MW and above, the largest capacity being 2.5 MW. Larger machines have resulted in a steady increase

in the Capacity Utilisation Factor (CUF) from 10 per cent–12 per cent in 1998 to 22 per cent–25 per cent in 2012. Technology is moving towards better aerodynamic design, use of lighter blades, direct drives, permanent magnet technology, and variable speed gearless operation using advanced power electronics. The health monitoring of wind turbines is now computer-controlled and on real-time basis.

14.212. Improvements in wind turbine technology and its installations at higher hub heights are working towards induction of higher capacity turbines. At the higher hub heights, wind potential is estimated to be substantially higher compared to the normal wind turbines at 40–60 metres hub heights. It is estimated that average capacity factor in USA has grown by about 25–30 per cent over the last decade. Even in India, the low capacity, older machines at highly favourable locations, need to be replaced by newer, and high capacity ones. Higher hub heights will enhance wind energy outputs, and will also be cost efficient.

PLAN OUTLAY

14.213. The indicative Twelfth Five Year Plan outlay for the various Ministries/Department in the energy sector is given in the Table 14.47 below:

TABLE 14.47
Indicative Twelfth Five Year Plan Outlay for the various Ministries/Departments in the Energy Sector

Sl. No.	Name of the Ministry/Department	Twelfth Plan (2012–17) Projections		
		GBS	IEBR	Total Outlay
1.	Ministry of Power	54,279	3,86,517	4,40,796
2.	Ministry of Coal	4,617	1,08,244	1,12,861
3.	Ministry of Petroleum and NG	5,147	4,36,541	4,41,688
4.	Ministry of Renewable Sources of Energy	19,113	13,890	33,003
	Sub-Total 1-4	83,156	9,45,192	10,28,348
5.	Department of Atomic Energy			
	(Power, Industry and Minerals Sectors)	21,737		
	R&D	19,878		
	Sub-Total DAE	41,615	65,572	1,07,187
	TOTAL (Energy)	1,24,771	10,10,764	11,35,535

ANNEXURE 14.1
Eleventh Plan Physical Progress of RGGVY Projects under Implementation

Sl. No	State/UT Name (Number of Districts)	Electrification of Un/De-Electrified Villages (Achievement)	Intensive Electrification of Electrified Villages (Achievement)	No. of Connections to BPL Households (Achievement)
1	Andhra Pradesh (22)	0	25,562	27,02,273
2	Arunachal Pradesh (16)	1,313	825	21,646
3	Assam (23)	7,829	11,672	8,07,290
4	Bihar (38)	22,029	4,267	21,49,834
5	Chhattisgarh (14)	857	10,512	9,15,407
6	Gujarat (25)	0	14,457	8,02,818
7	Haryana (18)	0	2,744	1,94,442
8	Himachal Pradesh (12)	78	1,059	10,078
9	Jammu & Kashmir (14)	148	2,380	44,014
10	Jharkhand (22)	1,7905	5,505	12,72,755
11	Karnataka (25)	61	24,575	8,34,196
12	Kerala (7)	0	37	17,238
13	Madhya Pradesh (32)	504	17,942	7,17,394
14	Maharashtra (34)	0	32,528	11,60,732
15	Manipur (9)	616	401	28,814
16	Meghalaya (7)	1,172	1,537	62,768
17	Mizoram (8)	89	338	14,743
18	Nagaland (11)	79	725	28,514
19	Orissa (30)	14,226	21,207	27,48,137
20	Punjab (17)	0	0	53,925
21	Rajasthan (33)	3,999	29,083	10,43,522
22	Sikkim (4)	25	375	9,366
23	Tamil Naidu (26)	0	9,992	5,02,956
24	Tripura (4)	127	463	80,986
25	Uttar Pradesh (65)	27,759	2,982	10,44,494
26	Uttarakhand (13)	1,511	9,028	2,30,558
27	West Bengal (17)	4,169	18,357	19,26,383
Total (546)		1,04,496	2,48,553	1,94,25,283

ANNEXURE 14.2
Sectoral Coal Demand/Off-take for Annual Plan 2012-13

Sl. No.	Sector	(In Million Tonnes)									
		2006-07	2007-08	2008-09	2009-10	2010-11	2011-12		2012-13		2016-17
		Actual	Actual	Actual.	Actual	Actuals	BE	Provi.	BE	BE	
I	Coking Coal										
	Steel/Coke Oven (indigenous)	17.37	16.99	16.58	15.92	16.80	17.23	16.05	22.00	22.00	31.70
2	Import	17.88	22.03	21.08	23.47	23.20	29.44	30.62	30.00	30.00	35.50
	Sub-Total Coking:	35.17	39.02	37.66	39.39	40.00	46.67	46.67	52.30	52.30	67.20
II	Non Coking										
3	(i) Power Utilities (Gen. Req.)	307.92	332.40	362.08	380.13	405.00	460.00	412.00	512.00	512.00	682.08
4	Cement	19.74	21.27	20.09	20.80	25.98	28.89	28.89	30.24	30.24	47.31
5	Steel DRI	17.47	20.92	19.78	22.89	28.80	30.47	30.47	35.30	35.30	50.33
7	Fertilisers	2.96	2.94	3.09	2.63	85.00	90.00	81.97	100.00	100.00	77.22
8	LTC/Soft Coke*	51.49	57.50	72.54	77.18						
9	Cokeries/Coke oven (NLW)*										
10	BRK and Others										
11	Captive Power	28.13	29.31	32.94	38.47	40.00	40.00	40.00	43.00	43.00	56.36
12	Colly.Consumpt.	0.99	0.93	0.85	0.76			0.73			
	Sub Total Non-Coking:	428.70	465.27	511.37	542.86	584.78	649.36	593.33	720.54	720.54	913.30
	Grand Total(I + II): including middlings	463.87	504.29	549.03	582.25	624.78	696.03	640.00	772.84	772.84	980.50
	Middlings	3.25	3.18	2.61	2.21						

Note: (i) *Included in BRK and Others.

ANNEXURE 14.3
Annual Plan 2012-13—Company-wise Production—Ministry of Coal

Company	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2016-17
	Actual	Actual	Actual	Actual	Actual	Target	Target	Target
ECL	30.47	24.06	28.14	30.06	30.81	33.00	33.00	45.00
BCCL	24.21	25.22	25.51	27.51	29.04	30.00	31.00	37.00
CCL	41.32	44.15	43.24	47.08	47.52	51.00	55.00	92.00
NCL	52.16	59.62	63.65	67.67	66.25	68.50	70.00	82.00
WCL	43.21	43.51	44.70	45.74	43.65	45.50	45.00	45.00
SECL	88.50	93.79	101.15	108.01	112.71	112.00	117.00	145.00
MCL	80.00	88.01	96.34	104.08	100.28	106.00	112.00	167.00
NEC	1.05	1.10	1.01	1.11	1.06	1.00	1.10	2.00
CIL	360.92	379.46	403.74	431.26	431.32	447.00	464.10	615.00
SCCL	37.71	40.60	44.54	50.43	51.33	51.00	53.10	57.00
Other Public Sector	1.77	2.02	1.84	3.30	1.81	3.55	18.00	23.00
Private-TIISCO	7.04	7.21	7.28	7.21	7.03	8.40	17.75	
Captive	17.61	21.17	29.87	35.03	34.60	38.25	39.80	100.00
Meghalaya	5.79	6.54	5.49	5.77	6.97	5.80		
Grand Total	430.84	457.00	492.76	533.00	533.06	554.00	575.00	795.00

ANNEXURE 14.4
Physical Targets of Renewable Programme for the Twelfth Plan

Programme	Proposed Twelfth Plan Targets
1. Grid-interactive Renewable Power(MW)	30,000
Grid Interactive Solar	10,000
Grid Connected Wind	15,000
Other Renewable Sources	5,000
2. Off-grid/Distributed Renewable Power (MWe)	3,400
Cogeneration from bagasse	2,000
Solar Off-Grid Applications	1,000
Waste to Energy	200
Bio Gas Based Decentralised Power	50
Others (Biomass Gasifiers, Micro-hydel)	150
3. Renewables for Rural applications (Cooking)	
Biogas Plants (million)	0.7
National Biomass Cook stoves Programme (million)	3.5
Solar Cookers (Box type + Dish type)	3.5
Solar Cooking in schools for mid-day scheme (Schools in lakhs)	5.0
4. Renewable Energy for Urban, Industrial and Commercial Applications	
Solar Water Heating Systems (million sq.m of collector area)	6
Solar Air Heating System (sq m.)	
CST based systems for community cooking (sq.m.)	50,000
CST based system for air-conditioning (125 systems, 30TR)	40,000 37,000
CST based systems for process heat (225 systems, 250 sq.m. area each)	53,750
5. Solar Cities	
New Solar Cities in addition to existing target of 60 cities and pending liabilities.	15
Model and Pilot Solar Cities.	
Green Townships.	25
Tourist/Religious/ Important Places	150 100
6. Alternate Fuel Vehicles (in numbers)	2,75,000
7. Power Generation from Hydrogen	
Stationery Power Generation (KW)	4,000
Hydrogen/H-CNG Stations (nos)	10
Demonstration projects for Hydrogen/H-CNG vehicles	500
8. Power Generation from Fuel Cell	10.0
Stationery Power Generation (KW)	10/2,000
Back- up units for telecom towers (MW/nos)	
Fuel cell Vehicles	100

Source: MNRE.

15

Transport

INTRODUCTION

Issues and Challenges

15.1. India's transport sector is grossly overstretched. The pace of economic development after the economic reforms has imposed a heavy burden on this sector. To meet the requirements of the economy during the Twelfth Plan it will have to address several challenges.

15.2. First, capacity needs are expected to double every decade in the medium term. It will consequently require large step-up in investments for capacity creation. The congestion and shortage of capacity is exhibited in all transport sectors. The National Highway network and the rail links along the North-South East-West corridors have very high traffic. In spite of expansion of ports capacity to more than a billion metric tonne by the end of the Eleventh Plan, a number of major ports have very high dwell time and are running at more than 90 per cent capacity. Of India's National Highways, less than one-third are two- or four-lane and a very large length of these are not able to support the 10.2 tonne permissible load per axle trucks are allowed to carry. While airport capacities have expanded significantly and kept pace with passenger demand, there is a need to expand the freight capacities to meet the growing requirements of the economy. Transportation of key commodities such as coal, iron ore, iron and steel and POL put heavy demands on transport system. Over the next 20 years, the demand for transport (both domestic and import) of these commodities

could well increase by a factor of four to six which would require investment in rail capacity and other modes. Apart from transport, there is severe lack of capacity in the allied activity of warehousing.

15.3. Second, the transport efficiency is low. The cost of rail and coastal shipping in the country is higher than many economies. Even the road costs and transit time across different modes are large. Partly, it is because the average speeds of movement of all the modes: Rail, Road, Coastal Ships is lower than those in more efficient economies. The average speed of freight trains is 25 km per hour which is nearly half that of the U.S. The other nature of inefficiencies relate to poor handling equipments at the ports, inadequate rail infrastructure, absence of modern technologies in several areas and high handling costs resulting from a variety of factors including thefts.

15.4. Third, there is an important distortion in the overall transport movement of goods. A study conducted by RITES indicates that there is a discernible gap between the way in which the traffic is actually moving today and the way in which it should move. A comparative assessment of the impact arising out of the two different scenarios of modal mix, that is, Actual and Optimal (applying break-even distances based on resource cost) on the transport system during the base year (2007-08) in terms of flows, cost and throughput reveals that there is a significant scope for modal switch from Road to Rail in the case of miscellaneous/other commodities up to the extent of 78 per cent.

15.5. The country transports nearly 57 per cent of the total goods by road, as compared to 22 per cent in China and 37 per cent in the U.S. In contrast, the share of rail is only 36 per cent compared to 48 per cent for the U.S. and 47 per cent for China. Despite the fact that a large part of India's freight traffic comprises bulk materials and moves over long distances that can be served efficiently by rail and waterways, the share of shipping through waterways is nearly 6 per cent as compared to 14 per cent in U.S and 30 per cent in China. This is imposing high cost on the economy by way of much higher dependence on fossil fuels and high level of green house gas emissions. On the basis of mode-wise share of originating loadings in 2007–08, the indicative CO₂ emissions from the major modes are given in Table 15.1.

TABLE 15.1
CO₂ Emissions from Various Transport Modes

Freight Transport (gm/tkm)		Passenger Transport (gm/pkm)	
Road	160	Passenger Cars	175
Rail	29	Rail	75
Shipping	31	Airways	229

15.6. On environmental considerations, hence, there is a need to encourage rail and shipping. Added to this is the lower cost of accidents associated with rail transport compared with road.

15.7. Fourth, there is a need to provide transport access to large unserved areas of the country. A number of States in the North-East have very little rail network. A number of airstrips in the NE region are not in use. While there have been efforts to expand the airlines network and the number of flights to the North East Region, its intra-regional connectivity is still low. A programme for development of roads in the northeast including Trans-Arunachal Highway has been taken up to improve road connectivity. It requires large financial and physical resources and management expertise to complete the projected network. Similarly, the expansion of rail network in the North East and several other parts of the country has been limited in the last six decades. Large areas of Jharkhand, Orissa, Madhya Pradesh, and Rajasthan have no access to rail network. In the Himalayan

States of Uttarakhand and Jammu & Kashmir, the network, particularly in the Hilly areas, is non-existent. These areas require extensive road and rail network for their integration with the markets.

15.8. Fifth, safety is a major area of concern especially in the road transport. Over 1.3 lakh people are known to die annually in road accidents alone and their number is rising. This is about 10 per cent of the world figure, though India's share in number of vehicles in the world is only 1 per cent. The World Health Organisation has forecasted road traffic injuries to rise and become the fifth leading cause of death by 2030. Safety levels in railways are also in need of urgent improvement.

15.9. Sixth, there is a near absence of an integrated regulatory regime for overseeing tariff setting, cost of operations, anti-competitive practices and accountability to consumers. There is a division of power between the Central Government and the State Governments. Some areas are reserved exclusively for Central Governance, while there are a few sectors that are subject to joint governance. An examination of the existing laws, policies and regulations indicate that they are a result of an ad hoc approach, which is exacerbated by the overlapping power of the Central and State Governments. The regulatory framework in different sectors has been developed without proper coordination among the sectors. Sometimes only a set of laws and/or policies govern a particular sector without a regulatory body to oversee the development and operations. The absence of a sectoral authority in the transport sector as a whole has led to fragmented and ineffective centres of governance.

Strategy

15.10. The challenges in the transport sector need to be addressed in a comprehensive manner with a set of policies, laws and regulations. This requires transport reforms. Some of the major initiatives required are mentioned below.

15.11. First, a more integrated approach is required to be taken of transport as a whole. Our vision for transport should be guided by a modal mix that will lead to an efficient, sustainable, economical, safe,

reliable, environmentally friendly and regionally balanced transportation system. Choices will need to be made on the priorities to be placed on different investments. Decisions on road expressways, dedicated rail freight corridors (DFCs), high speed trains and movement through inland waterways or coastal shipping must be taken holistically so that the objective of speed and efficient energy usage is achieved. Policy decisions should be based on life cycle energy costs of different transport modes.

15.12. While, pursuing the above objectives, two important initiatives could be taken:

1. Transportation by containerisation would need rapid expansion. While a number of initiatives in this regard have been taken earlier, the share of container transport is still low. Considering the international experience, major efforts are required to expand container traffic including expansion of the network of dry ports (ICDs).
2. Intermodal connectivity to be given thrust during the Twelfth Plan, by developing India's Inland Waterways which totals about 14,500 kilometers in length along with coastal shipping. Strategies, such as setting up coastal terminals at major ports, providing adequate road and rail connectivity to inland water and coastal terminals and non-major coastal ports, lowering the manning scales and vehicle specifications for coastal ships and other measures would be taken during the Twelfth Plan.

15.13. Second, the sector requires large increase in investments. Larger and focused investments will be able to address the two key issues of rapid increase in capacity and improvement in efficiency of infrastructure. The Interim Report of the National Transport Development Policy Committee (NTDPC) has strongly focused on need for capacity expansion of the railways over the next 20 years. All projections for the growth in demand for both freight and long distance passenger services suggest that overall economic growth could be stymied if appropriate strategic choices are not made now to facilitate significant capacity expansion of the railways, as has been done in China over the past decade or so. Such an

expansion will not take place in a business as usual scenario. If consistent economic growth of 7–10 per cent per annum is to be achieved over the next 20 years, there is a pressing need for unprecedented capacity expansion of the Railways for both freight and passenger traffic in a manner that has not taken place since independence. It is of utmost importance that a vision similar to that of NHDP is laid down for the Railways now so that we may expect a transformed railway network by 2030.

15.14. It is estimated that the infrastructure sector will need investment of one trillion dollars in the Twelfth Plan. Of this, major share will be in the transport sector. Given the limitation of public resource, private investments will have to be emphasised and expanded. A Public–Private Partnership (PPP) regime has already been put into operation in road sector very successfully. While in Ports, Airports, Railways and Inland Waterways, there have been efforts in private investments in varying degrees, there is a need to step up an investment particularly in the railways. There will be a special focus required for increased investment in the railways from public resources, as well for safety, modernisation and expansion. It is estimated that the share of private investments, of the total infrastructure investments in the economy was nearly 40 per cent by the end of the Eleventh Plan, the rest being public investments. This needs to be increased to 50 per cent to 60 per cent during the Plan.

15.15. Third, transport reforms are needed in pricing and fiscal areas. In several sectors, the transport pricing policies are unsustainable. The Railways have not revised their passenger tariffs for several years, despite sharp increase in fuel prices and other operating costs. They are further making investments in uneconomic lines, despite lack of resources. This thin spreading of the financial resources has delayed completion of viable projects and thus, led to further deterioration of their finances. There is an urgent need to undertake a review of projects and prioritise them as well as to abandon or not to commence work on the many unremunerative projects which have not made substantial progress till now. Similarly, the taxation policies on aviation fuel have led to uneconomic

operations of the airlines. For coastal shipping lines, similarly, benefits as available in other major economies to the coastal shipping lines need to be provided.

15.16. Fourth, transport safety has been a neglected area in the past and credible institutional framework to address these issues at Centre, States and city level is required. The entire transport system must be designed to accommodate the individual who has the worst protection and lowest tolerance of violence. The Twelfth Plan period would be used to setting appropriate institutional structures that create a demand for scientific work in safety issues; have proper legislation and regulation; monitoring and measurement by setting up national databases of relevant information to monitor and assess various aspects of safety policies, technologies and knowledge needs. The National Transport Policy Development Committee (NTDPC) has recommended setting up institutes for road, railway, water and air safety to ensure the safety professionals are abreast of international knowledge and findings as well as provision for funding and establishment of multidisciplinary safety research centres at academic institutions. It has also recommended establishing National Boards for Road, Railway, Water/Marine and Air Safety. There is a strong need to put into action the recommendations of the Sundar Committee on Roads and the Kakodkar Committee on Railways.

15.17. Fifth, transport access is critical for inclusive growth, economic development, access to markets and participation in the political process. Development of rural roads, expansion of rail infrastructure in large unserved areas will, therefore, need special emphasis during the Twelfth Plan. Every minute a woman dies in child birth, but many of these deaths could be avoided with timely access to transport. Gender responsive infrastructure interventions can free up women's time by lowering their transaction costs. This, in turn, will increase girls' school enrollment and facilitate women's participation in income generation and decision making activities.

15.18. Social inclusion requires that needs of the differently abled are kept in mind while developing the economy. It will be, therefore, important that

the transport sector makes special arrangements for their needs, so that they are able to access it conveniently and thus fully participate in our social and economic process and contribute to it.

15.19. Sixth, human resource development would be a key factor in achieving the objective of creating a well-developed and efficient transport system in the country. The NTPDC report has pointed to a severe lack of expertise in the country in almost every sphere of transportation which makes it necessary for a quantum jump in capacity augmentation for all modes. The quantitative improvements to infrastructure need to be made in the context of more qualitative considerations of safety, emissions, energy efficiency, climate change impact and social equity. The Committee has recommended setting up national institutes for research and statistics, multi-disciplinary research institutions, State and city level institutions and centres of excellence in existing academic institutions. These suggestions will need to be implemented during the Plan.

15.20. Seventh, connectivity of the North-East, both within the region and with the far eastern region, including Myanmar, Bangladesh and Thailand, would be one of the focus areas for economic development of the region and expanding economic activities including trade and commerce. Inland Water Transport connectivity with Bangladesh will need to be specially emphasised. Simultaneously, connectivity of the North East region through rail, road, air with the neighboring countries and its rapid expansion within the region would also need special focus during the Plan.

RAILWAYS

15.21. Indian Railways is the fourth largest railway network in the world in terms of route kilometers. As on 31 March 2011, it has a total route length of 64,460 km of which 21,034 km is electrified. The total track length is 1,13,994 km of which 1,02,680 km is broad gauge, 8,561 km is meter gauge and 2,753 km is narrow gauge. Considering the requirements of the economy and size of the country, the expansion of the railway network has been inadequate. Indian Railways have added 11,864 km of new lines since independence.

It has not been able to cover major areas in many states and has very little presence in the North-East States and the Himalayan region. However, during the same period the length of broad gauge route kilometer has been doubled from 25,258 km to 55,188 km through new lines as well as gauge conversion of 21,658 km from meter and narrow gauges to broad gauge. Gauge Conversion has been instrumental in adding capacity in the system despite a relatively low addition of new lines. The network needs extensive modernisation, increase of speeds, improvement in safety and modernisation of rolling stock to meet the needs of a rapidly growing economy.

Review of the Eleventh Plan

Financial Performance

15.22. The Eleventh Plan period has seen steady deterioration in Railway's financial position (Table 15.2) which is in sharp contrast with the Tenth Plan performance when the Railways had achieved a remarkable turnaround in financial performance. The Revenue (gross traffic receipts) have gone up by 7.7 per cent (CAGR) during the period 2007–08 to 2011–12 whereas the Total Working Expenses has gone up by 12.6 per cent (CAGR) during the same

period leading to decline in the net revenue which has shown a negative growth rate of –17.9 per cent (CAGR) during the above period. After accounting for dividend, the net excess has reduced from ₹13,431 crore in the first year of the Plan to only ₹1,201 crore in the terminal year of the Plan. In 2009–10, the balance had reduced to a token figure of less than a crore. One of the major reasons for increase in the working expenses during the Eleventh Plan period has been the increase in wage bills by nearly ₹73,000 crore due to the implementation of the Sixth Pay Commission. However, in the first year of the Twelfth Plan (2012–13) Indian Railways have targeted a revenue surplus of ₹15,557 crore and operating ratio of 85 per cent.

Investments in Eleventh Plan

15.23. Lack of surplus has impacted the capacity to generate resources for investment in the system (Table 15.3).

15.24. During the Eleventh Plan period (2007–12), the Ministry of Railways had an investment target of ₹2,33,289 crores comprising of ₹63,635 crore as GBS, ₹90,000 crore as internal generation and ₹79,654 crore as Extra Budgetary Resources (EBR) through

TABLE 15.2
Overview of Financial Position of the Indian Railways

		(in ₹ Crores at current prices)						
Sl. No.	Description	Terminal Year of Tenth 2006–07	2007–08	2008–09	2009–10	2010–11	2011–12 (RE)	Twelfth 2012–13 (BE)
1	Gross Traffic Receipts	62,731	71,720	79,862	86,964	94,536	1,03,917	1,32,552
2	Net Ordinary Working Expenses	37,432	41,033	54,349	65,810	68,139	75,650	84,400
3	Appropriation to Pension Fund	7,416	7,979	10,490	14,918	15,820	16,800	18,500
4	Appropriation to Depreciation Reserve Fund	4,198	5,450	7,000	2,187	5,515	6,160	9,500
5	Total Working Expenses	49,047	54,462	71,839	82,195	89,474	98,610	1,12,400
6	Net Revenue	14,453	18,334	9,714	5,544	6,346	7,144	22,233
7	Total Dividend Payable	4,247	4,903	4,718	5,543	4,941	5,652	6,676
8	Excess/Shortfall	10,206	13,431	4,456.78	0.75	1,405	1,492	15,557
9	Operating Ratio (per cent)	78.7	75.9	90.50	95.30	94.60	95	85
10	Ratio of Net Revenue to capital at charge and investment from capital fund (per cent)	19.0	20.71	8.80	4.51	4.40	4.43	12.10

Source: Explanatory Memorandum to the Railway Budget for Various Years.

TABLE 15.3
Investment in Railways during Eleventh Plan

(In ₹ Crore at current prices)

Eleventh Plan	Approved Outlay	2007–08	2008–09	2009–10	2010–11	2011–12 (RE)	Total for Eleventh Plan	Excess/ Shortfall	2012–13 (BE)
Gross Budgetary Support	63,635*	8,668	10,110	17,716	19,485	21,060	77,039	13,404	24,000
	27.3 %	29.9 %	27.8 %	44.7 %	47.9 %	45.3 %	40.1 %	21.1 %	41.8 %
Internal Generation	90,000	14,948	18,941	12,196	11,528	9,091	66,704	(-)23,296	18,948
	38.6 %	51.6 %	52.1 %	30.7 %	28.3 %	19.4 %	34.7 %	(-)25.9 %	31.5 %
Extra Budgetary Resources	79,654	5,364	7,284	9,760	9,680	16,316	48,404	(-)31,250	16,050
	34.1 %	18.5 %	20.0 %	24.6 %	23.8 %	35.1 %	25.2 %	(-)39.2 %	26.7 %
Total	2,33,289	28,980	36,336	39,672	40,693	46,467	1,92,147	41,142	60,100

*Includes 13572 crore as additional budgetary support for national projects

market borrowings. The actual expenditure against this originally approved outlay for the Eleventh Plan period comes to ₹1,92,147 crore—comprising of GBS of ₹77,039 crore, internal generation of ₹66,704 crore and EBR of ₹48,404 crore. Thus there was a shortfall of ₹41,142 crore (17.6 per cent). The anticipated utilisation under GBS would be ₹77,039 crore against the projected outlay of ₹63,635 crore which is an increase of 21 per cent over the estimate whereas internal generation and EBR components were lower by 25.9 per cent and 39.2 per cent respectively. It is evident that the internal generation and borrowings have not kept pace with the investment requirement.

Physical Targets and Achievements

15.25. The Eleventh Plan targets and achievements for freight and passenger business are summarised in Tables 15.4 and 15.5. It will be seen from Table 15.4 that as against the original target of 1,100 MT for the terminal year of the Eleventh Plan, the actual achievement is 970 million tonnes which is 11.8 per cent lower than the original target and 5 per cent lower than the revised target of 1,020 MT. In NTKM terms, the achievement has been 639.77 billion which is 8.9 per cent lower than the original target of 702 billion and 5.1 per cent lower than the revised target of 674 billion. In terms of growth rates of traffic, as against the projected growth in originating freight traffic of 8.6 per cent, the actual growth was only 5.8 per cent (CAGR) and in NTKM terms, it was 6.1 per cent as against a target of 7.8 per cent. The performance in NTKM is better because of marginal increase in lead.

Growth rate of freight traffic is lower than the growth rate in GDP during this period. This was contributed by a sharp drop in exports of iron ore, problems in mining of iron ore leading to inadequate domestic movement and poor growth in coal movement due to slowdown in coal production, particularly in the last two years of the Plan. The freight basket of railways needs diversification to include manufactured goods through containerisation so that slow down in the core sector of the economy (coal, steel and so on) can be compensated.

Passenger Business

15.26. The originating passenger traffic achieved in the terminal year of the Eleventh Plan is 8,139 million which is 3.2 per cent lower than the original Eleventh Plan target of 8,400 million but 0.75 per cent higher than the revised target of the Eleventh Plan. In terms of growth rates, against the targeted CAGR of 6.2 per cent, originating passenger traffic grew at the rate of 5.5 per cent (Table 15.5). In terms of Passenger Kilometers (PKM), the volume achieved is 1,062 billion which is higher than the original target but lower than the revised target. The CAGR of PKM was 8.8 per cent which was much higher than the original target of 5.9 per cent. This indicated a very significant expansion due to higher leads of non-suburban traffic. It increased from 215.5 km in year 2006–07 to 229.3 km in year 2008–09 and has maintained the higher level. Railways are making large revenue losses in passenger traffic both in suburban as well as non-suburban segments (Table 15.6). Non-revision

TABLE 15.4
Performance of Freight Business during Eleventh Five Year Plan

Item	Tenth Plan Actuals in Terminal Year 2006–07	Eleventh Plan Targets for Terminal Year 2011–12	Eleventh Plan Revised Targets in Mid-Term Review for Terminal Year 2011–12	2007–08	2008–09	2009–10	2010–11	2011–12	CAGR
Originating Tonnage (Million Tonnes)	728.4	1 100	1 020	794.21	833.31	887.99	921.5	970	
Growth (%)		8.6	7	9.03	4.92	6.56	3.77	5.26	5.8
NTKM (Billion)	475	702	674	511.8	538.23	584.76	605.99	639.77	
Growth (%)		7.8	7	7.7	5.16	8.65	3.63	8.67	6.1

of tariff for several years has led to poor financial health of this segment.

Infrastructure Capacity Creation—Targets and Achievements

15.27. The Eleventh Plan attempted a paradigm shift from the earlier incremental approaches to one of significant infrastructure capacity addition to handle the quantum increase in traffic levels and to sustain mobility on the network by setting ambitious targets as compared to the performance during the Tenth Plan. The targets in respect of new lines and electrification have been exceeded (Table 15.7). However, in respect of doubling of lines which is a major

component for improving Railways' capacity, there has been a shortfall as compared to original targets and in case of gauge conversion there has been a shortfall as compared to the revised targets.

Throw-Forward of Infrastructure Projects

15.28. One of the major problems in the Railways has been excessive sanctioning of new projects annually, much beyond the resources available which only increases the throw-forward (number of projects under implementation) (Table 15.8). There is an urgent need for a policy to limit the throw-forward to a certain proportion of their annual expenditure on these projects.

TABLE 15.5
Performance of Passenger Business during Eleventh Five Year Plan

Item	Tenth Plan Actuals in Terminal Year 2006–07	Eleventh Plan Targets for Terminal Year 2011–12	Eleventh Plan Revised Targets in Mid-Term Review for Terminal Year 2011–12	2007–08	2008–09	2009–10	2010–11	2011–12	CAGR
Originating Passengers (Million)	6,219	8,400 (CAGR = 6.2 %)	8,200	6,524	6,920	7,246	7,651	8,139	5.5 %
Passenger KM (Billion)	695	924 (CAGR = 5.9 %)	1,100	770	838	903	979	1,062	8.8 %

TABLE 15.6
Losses in Passenger Services

Year	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Losses (₹crore)	6,159.41	6,022.66	6,449.22	7,067.67	13,901.22	18,960.67	19,964.03

TABLE 15.7
Capacity Creation during Eleventh Plan

Item	Tenth Plan Achievement (km)	Eleventh Plan Original Target (km)	Revised Target for Eleventh Plan during Mid Term Appraisal (km)	Eleventh Plan Achievement (km)	Improvement over Tenth Plan (%)
New Lines	920	2,000	2,000	2,205	139.6
Gauge Conversion	4,289	10,000	6,000	5,290	23.4
Doubling	1,300	6,000	2,500	2,756	112
Railway Electrification	1,810	3,500	4,500	4,501	148.7

Rolling Stock Procurement and Production

15.29. During the Plan, acquisition of wagons has exceeded the target but fallen short in coaches while in diesel locomotives and electric locomotives the revised targets have been achieved. The performance, however, represents a large jump over the Tenth Plan achievements (Table 15.9).

15.30. The emphasis in the Eleventh Plan period has been on manufacturing high horse power electric and diesel locomotives, EMUs/MEMUs and Metro coaches based on GTO/IGBT technology.

Track Renewal

15.31. Arrears of track renewal have been brought down from 6,200 km in the beginning of the Eleventh Plan to 3,500 km at the end of the Eleventh Plan. Around 18,000 km of track renewals have been carried out in the Eleventh Plan period.

Productivity

15.32. Table 15.10 gives an assessment of the performance of Railways and productivity improvements

during the first four years of the Eleventh Plan. The improvement in productivity during the Plan indicates increased congestion on the Railway track system.

15.33. The productivity of employees and of the network is important for assessing the operational efficiency. Table 15.11 gives an international comparison. It is clear that the network productivity of Indian network is good in passengers traffic. In terms of employees' productivity in freight Indian Railways is 1/3rd that of China and about 1/4th that of Russia

Initiatives Taken During Eleventh Plan

Freight and Passenger Business

15.34. Railways have taken several initiatives during the Plan for expanding the share of freight traffic. These include introduction of freight marketing of select commodities by third parties, introduction of liberalised wagon investment schemes to attract private investment in special purpose and

TABLE 15.8
Throw Forward of Infrastructure Projects as on 1 April 2012

Infrastructure	Number of Works in Progress	Length in km	Cost (₹ crore)	Throw Forward 1 April 2012 (₹ crore)
New Lines	132	14,212	1,23,767	89,792
Gauge conversion	42	9,880	35,051	18,659
Doubling	174	9,015	49,295	38,766
Electrification	39	4,700	4,100	6,229
DFC Project	2	3,338	95,860	93,860
Total	389	41,145	3,08,073	2,47,306

TABLE 15.9
Rolling Stock Performance during Eleventh Plan

Item	Tenth Plan Achievement	Eleventh Plan Original Target	Revised Target for Eleventh Plan during Mid Term Appraisal	Achievement in the Eleventh Plan	Improvement over Tenth Plan (%)
Wagons	36,222	62,000	62,000	63,481	75
Coaches (including EMU/MEMU/DEMU)	12,202	22,500	19,863	17,085	40
Diesel Loco	622	1,800	1,019	1,288	107
Electric Loco	524	1,800	1,205	1,218	132

Note: This includes acquisition, as well as, railways' own production.

high capacity wagons, freight incentives policies including dynamic pricing concept and so on. On the passenger front, during the Eleventh Plan, 323 pairs of new trains have been introduced, services of 111 trains have been extended and frequency of 63 trains increased. 2,813 coaches have been added for expanding passenger carrying capacity. High capacity, air-conditioned double-decker coaches, low-priced, fast train services such as Garib Rath and facilities in trains services for ladies, students and marginalised groups have been introduced.

Traffic Facility Works, Strengthening of High Density Network (HDN), Augmentation of Terminal Capacity and Development of Logistics Parks 15.35. A substantial amount of traffic of Indian Railways moves on the route connecting four metropolitan cities—Delhi, Mumbai, Chennai and Kolkata. These 7 main routes along with feeder routes totalling 17,383 Route km have been identified as high density network (HDN). A total of 124 works costing about ₹14,000 crore including doubling, third and fourth lines, bye passes, flyovers, crossing stations,

TABLE 15.10
Productivity Performance

Productivity indicator	Tenth Plan (2006–07)	Eleventh Plan			
		2007–08	2008–09	2009–10	2010–11
Wagon Utilisation					
NTKM/VU/Day (Broad Gauge (BG))	3,238	3,539	8,687	9,022	9,247
Wagon Km/Wagon/Day (BG)	230	248.9	253.7	256.2	262.1
Wagon turnaround in days (BG)	5.49	5.23	5.19	4.98	4.97
Track Utilisation					
NTKM/route Km (million)	9.67	10.19	10.43	11.07	11.34
Passenger Km/route Km (million)	13.47	14.63	15.53	16.35	17.36
NTKM/Engine Day Online (goods-BG)					
Diesel	2,68,410	2,64,137	2,70,912	2,85,008	3,02,245
Electric	3,61,543	3,84,981	4,25,329	4,43,386	4,53,960
Human Resources Productivity					
NTKM/employee (million)	0.34	0.37	0.39	0.44	0.47
PKM/employee (million)	0.49	0.55	0.60	0.66	0.73

TABLE 15.11
Benchmarking Indian Railways with Chinese and Russian Railways

Railways	Employee Productivity (Annual)		Network Productivity		Wagon Productivity (Annual)
	NTKM (million)/ Employee	PKM (million)/ Employee	NTKM (million)/ Network Length	PKM (million)/ NetworkLength	NTKM (million)/ Wagon holding
Russia	1.81	0.15	21.87	1.80	5.52
China	1.23	0.38	39.66	12.38	4.31
India	0.44	0.66	9.39	14.12	2.73

Source: UIC Statistics 2009–10.

intermediate block stations, automatic signalling works, yard remodelling and so on were planned to augment capacity on the HDN. A total of 128 works for development and modernisation of freight terminals have been sanctioned since the year 2007–08 and are in progress at different locations.

Information Technology Initiatives

15.36. The Eleventh Plan emphasised the need to 'use IT for improved customer services'. More than 5,071 locations have been provided with Unreserved Ticketing System (UTS). The Passenger Reservation System (PRS) is now available at more than 2,438 locations and is planned further to be expanded to facilitate the passengers to buy tickets closer to their homes and work places. Proliferation of e-ticketing has helped in reducing queue lengths at reservation offices. To facilitate dispersal of tickets, PRS counters have been provided at 151 Post Offices. Complete roll out of Rake Management System (RMS) module has enabled online monitoring of freight train operations and improved intra and inter-zonal coordination. Terminal management system has been introduced at 1,653 terminals. The e-payment facility is being availed by 440 freight customers and accounts for more than 40 per cent of freight earnings. Other IT initiatives undertaken to improve operational efficiency are Crew Management System, Control Office Application, e-Procurement and so on.

Energy Management, Energy Efficiency and Measures to Improve Environmental Friendliness

15.37. Reduction in empty wagon movement by adopting a new maintenance regime of premium

examination and rationalisation of coaching links for increased maintenance intervention of 3,500 km (from the earlier limit of 2,500 km) are some of the important operational improvements. On fuel efficiency front, increased production of 3 phase electric locos with 14 per cent to 15 per cent energy regeneration feature during braking, fuel efficient 3 phase diesel locos with 10 per cent higher fuel efficiency than conventional locos and adoption of 3 phase EMUs regenerating about 25 per cent to 30 per cent of energy during braking are some of the important initiatives taken up during the Plan period. A 10.5 MW capacity wind farm has been commissioned to provide captive power to Integral Coach Factory at Chennai and more wind farms are planned in other states. 2.6 million incandescent lamps are being replaced with CFLs in households to conserve energy.

15.38. For availing electric power at lower tariff, Indian Railways has set up a 1,000 MW power plant at Nabi Nagar through a JV with NTPC. It is expected to be operational by the beginning of the Twelfth Five Year Plan. This plant will supply 90 per cent of generated power to 164 substations of Indian Railways located in Eastern and Western regions and will result in a saving of ₹400–600 crores per year to the Railways due to lower tariffs. Another 1,000 MW captive power plant is being set up at Adra through a JV with NTPC.

15.39. To improve sanitation and to prevent discharge from toilets while the train is in Railway Station premises, speed actuated discharge toilets

have been provided in all LHB type coaches and a select number of ICF coaches. Field trials for biodegradable and environment friendly toilets (in collaboration with IIT/Kanpur and DRDO) are on. On successful completion of these trials toilets would be introduced in passenger coaches in a phased manner.

The Twelfth Plan

Strategies

15.40. The Twelfth Plan aims at faster, more inclusive and sustainable growth. This will require continued work in several areas and a change in strategy in others. The expanding requirements of the economy will need much faster expansion of the freight network along with its ability to carry larger freight per wagon, improve efficiency of the Rail system to deliver it faster and expand the network. There will also be need to improve the share of the Railways in the overall national freight market. With increasing incomes, passenger traffic will increase but plan for expansion must factor in the fact that demand will be for better quality services for which passengers will be willing to pay.

15.41. The rail network will have to develop a strategy to be part of an effective multi-modal transport system to ensure environmental-friendly and economically efficient transport movement. The Twelfth Plan will strive towards achieving a gender equal Railway Transport System designed to meet the needs of both men and women. Priority will be accorded to women's safety and security. Simultaneously, the network will have to be expanded to other areas where so far there has been little presence, especially in the Himalayan region and some of the tribal areas. One of the most important components of this strategy will be stepping up private investments in the Railways.

15.42. Investment needs to be prioritised in the important areas, viz. Dedicated Freight Corridors, high capacity rolling stock, last mile rail linkages and port connectivity. Development of logistic parks would also need to be taken up on priority basis to

create matching terminal and handling capacity, and facilitate integration of rail with other modes of transportation. Enhancing project execution capabilities would be critical for speedy capacity creation and improved returns on investments. Along with new capacity addition, improving productivity of existing network and assets would also be crucial to increase transportation output.

15.43. It has to be clearly realised that the modernisation of Indian Railways cannot be achieved by simply relying on additional General Budgetary Support (GBS). Even the norms and methodology of GBS allotment should be clearly defined. There is a case for larger GBS but the requirements are so large that the Railways have to plan for much stronger revenue growth. Clear Strategies would need to be formulated and executed to identify segments where it can play low-cost strategy by playing on volumes, taking advantage of economies of scale and segments where it can play differentiation strategy by providing high quality services and command premium prices.

Physical Targets for the Twelfth Plan

Freight Traffic Projections

15.44. Traffic projections for the Twelfth Plan are given in Table 15.12. It is targeted that during the Twelfth Plan, the rail share in freight should go up by at least 2 per cent. The targets for originating freight tonnage may need to be reviewed on an annual basis or during the mid-term review to ensure the target of 2 per cent increase in originating tonnage. Given that the level of traffic growth achieved in the last Plan has been 5.8 per cent for originating traffic and 6.1 per cent for NTKM, it will require a major increase in efforts and a conscious strategy to move the road traffic over to the rail. This is going to be a challenging task.

Technological and Logistical Measures for Improving Freight Movement Efficiency

15.45. An important component of the strategy for increasing the freight movement efficiency will be introduction of new technologies aimed at

TABLE 15.12
Traffic Projections

Loading	2012–13	2013–14	2014–15	2015–16	2016–17
MT (million)	1,038	1,119	1,206	1,300	1,405
CAGR			7.8 per cent		
NTKM (billion)	690	737	795	857	927
CAGR			7.7 per cent		
Lead	665	664	663	661	660

improving axle load of wagons, expansion of long haul, use of GPS and RFID technology for tracking purposes and technological innovations to improve efficiency of operations.

1. *Proliferation of 25 tonnes axle load running:* Along with this, feasibility of 30 tonnes axle load running and induction of 30 tonnes axle load wagon needs to be planned.
2. *Raising the current axle load regime from 22.82 tonnes to 23.5 tonnes on selected routes:* It is observed that 98 per cent of Indian Railways loading comes within a gross weight of wagons being equivalent to 94 tonnes which translates to 23.5 tonnes of axle load. The new BOXNHL wagons primarily designed for coal have sufficient volumetric capacities for loading additional 2 tonnes of coal.
3. *Expansion of Long Haul*
4. *Use of GPS technology and RFID technology* for tracking purposes and use of Distributed Power Systems.
4. There is also a need to create multimodal logistics parks to reduce the cost of interfacing and costs of intermodal transfer and overall production. Logistics parks are network hubs, critical for efficient multimodal transport as they allow transshipment between modes and consolidation of freight. Earmarking land for logistics parks at about 15 to 20 key interchange points around major key urban and industrial centres, ideally on the proposed rail Dedicated Freight Corridor (DFC) routes; and providing infrastructure such as power, utilities, road/DFC linkages and rail sidings.
5. Containerisation would be a major strategy to gain share of the freight market (Box 15.1).

Passenger Traffic Projections

15.46. The CAGR of passenger traffic during the Eleventh Plan has averaged around 5.5 per cent. The number of passengers travelling annually will thus increase from 8.9 billion in the first year of the Plan to 11.7 billion by the end of the Plan (Table 15.13). The projections for Passenger Kilometers have also been made based on past trends (Table 15.14). The growth in PKM is expected to be 10.8 per cent per annum with an increase to 1,760.4 billion PKM (2016–17) from 1,195 billion PKM (2012–13).

Measures to Upgrade Quality of Passenger Services

15.47. To meet the requirements of passenger services a number of steps are planned in the Twelfth Plan. Some of the important areas proposed to be taken up are mentioned below:

1. *Enhancing accommodation in trains:* Augmenting the load of existing services with popular timings and on popular routes to 24/26 coaches would help generating additional capacity and availability of additional berths/seats for the traveling public.
2. *Enhancing speed of trains:* At present, speed of Mail/Express trains is below 55 kmph. Segregation of freight and passenger traffic, enhancing the sectional speeds, and rationalisation of stoppages are important measures for speed enhancement. The speed of passenger trains is quite low at present primarily because of the coaching stock in use and due to multiplicity of stoppages en-route. There is scope for speeding up of these services by replacing trains with conventional stock by fast moving EMUs/MEMUs/DEMU. Enhancing the sectional

Box 15.1 Containerisation In Railways

Due to the economic and technological attributes of the railways, it has always been a challenge to attract consignments which are less than at least a thousand tonnes. Container trains combine the operational efficiency of unit trains with the commercial flexibility of booking 20 tonnes or even less at a time. According to the Total Transportation Study (TTS) conducted by RITES for the Planning Commission, the volume of non-bulk traffic in 2006–07 was 227.17 million tonnes out of the total traffic of 2,386.97 million tonnes.

Indian Railways set up Container Corporation of India (Concor) in 1988 as a public sector company to spear head containerisation. It commenced operations in 1989 at which stage Indian Railways transferred all Inland Container Depots (ICDs) and container related business to Concor. From the 7 ICDs it took over from Indian Railways at inception, Concor has now expanded the network to more than 44 ICDs and 14 domestic and port side terminals and has 213 rakes of flat wagons. Using IR's network and haulage, it has pioneered the concept of multi-modalism through its core activities as a carrier of rail borne container traffic and terminal operation.

Anticipating higher container traffic at Indian ports, Railways liberalised the entry of private players in the area of rail-based haulage of containers in 2005. The response has been quite good with 15 new entrants. These 15 new operators have procured 132 rakes and developed 9 new terminals. Sizeable on-track competition has emerged in some of the exim sectors as well as the domestic sector. Competition also led to an increase in the growth of rail based intermodal traffic at a rate of 15.5 per cent in the period 2007–08 till 2011–2012 although there has been a negative growth rate in the domestic sector during 2011–12 due to introduction of container class rate for some of the commodities moved normally by conventional wagons. There is a need to expand containerisation business and improve Railways share in transport sector. Policies in the Twelfth Plan will aim at this.

TABLE 15.13
Passenger Traffic Projections for Twelfth Plan

Year	Projected Passengers Originating (Million)				
	Suburban		Non-Suburban		Total
	Nos.	Ratio	Nos.	Ratio	
2012–13	4,545	51.25	4,323	48.75	8,868
2013–14	4,855	51.07	4,651	48.93	9,506
2014–15	5,186	50.89	5,005	49.11	10,191
2015–16	5,540	50.71	5,385	49.29	10,925
2016–17	5,917	50.53	5,793	49.47	11,710

Note: Originating passenger traffic projections have been made based on average correlation with GDP calculated for the preceding 5 years.

speeds is another enabling factor in speeding them.

4. *Introduction of tailored services:* The traveling requirements of various sectors and various classes of passengers differ. Between major cities and metros, fast services with very limited stoppages are preferred. Introduction of non-stop services and services with higher accommodation between popular destinations would better serve passengers' requirements.

TABLE 15.14
Projection of Originating PKM for Twelfth Plan

Year	Projected PKMs Originating (Billion)				
	Suburban		Non-Suburban		Total
	Nos.	Ratio	Nos.	Ratio	
2012–13	159	13.32	1,036	86.68	1,195
2013–14	170	12.97	1,146	87.07	1,316
2014–15	182	12.54	1,268	87.46	1,450
2015–16	194	12.15	1,404	87.85	1,598
2016–17	207	11.76	1,553	88.24	1,760

15.48. Strategies for decongesting major passenger terminals: This would be done through development of alternative terminals in suburban areas of major cities and expeditious operationalisation of the Dedicated Freight Corridors resulting in segregation of passenger and freight traffic. Spin off effects in the form of larger number of passenger services, faster passenger services, quicker freight movement, and help in decongesting major terminals would be achieved. There are international examples of efficient passenger and freight operations which have relevance for Indian Railways (Box 15.2).

Box 15.2**Business Models for Passenger and Rail Freight Logistics: The JR East and Deutsche Bahn Ways**

JR East is the largest among the four Japanese railway companies and amongst the most successful operators of rail passenger business in the world. It operates urban, high speed and regional railways. On a daily basis, JR East handles 17 million passengers, runs 12,761 trains which cover 7,10,600 Km. per day. Its average delay is less than 1 minute including all kinds of delays, even those due to snow and typhoons. JR East runs the famous Shinkansen high speed trains. Out of a total operating Km. of 7,512.6, Shinkansen lines cover 1,134.7 Km. and conventional lines cover 6,377.9 Km. An important aspect of JR East business is that it earns 30 per cent of its revenues from non-transportation business. This translates to nearly 8.13 billion dollars from non-transportation business out of its total business of 27.7 billion dollars. Non-transportation business includes station space utilisation (15.4 per cent), shopping centres and office buildings (8.3 per cent) and other services (8.4 per cent). The non-transportation business, also called the life-style business is aimed at maximising the values of JR East's tangible and non-tangible assets such as railway network and stations. It has renovated a large number of stations in the past two years including the iconic Tokyo station which is being modernised. It includes building two towers of more than 4,30,000 sq.m of office buildings and hotels, 1,500 sq.m of shopping floors and development of pedestrian decks and restoration and conservation of the old Tokyo station.

An alternative model of earning revenues and running the business profitably is that of Deutsche Bahn (DB) of Germany. It consists of 3 divisions and 9 business units including passenger transport which covers long distance, regional and urban passenger transport; infrastructure which includes track, station and electrification and the third Division being Schenker, world's leading logistics service company covering areas of rail freight transport, global logistics services and rail technology and services. In 2011-12, the total revenue of DB was 37.9 billion Euros with an EBIT of 2.3 billion Euros. Like JR East, substantial part that is 48 per cent of the revenues of DB comes from non-rail business. DB is increasingly becoming active in markets outside Germany with 41 per cent of the revenues coming from international operations. It runs 26,000 passenger trains per day which carry 2.7 billion passengers per year in trains and buses. It is also the fifth largest provider of energy in Germany. As part of its freight and logistics business, DB is spread to more than 2,000 locations in over 130 countries with 412 million tonnes of freight transported by rail per year, 96 million shipments sent per year via European land transport and more than 5 million sq.m. of storage space around the world (figures as in December 2011). It is interesting to note that Germany has 33,600 Km. long rail network which is three times as long as the German Autobahn (Highway) network.

Parcel Business

15.49. One of the important areas to be taken up for rationalisation and expansion will be the parcel business. The annual earnings from parcel services were ₹1,377.38 crore (2010-11). These are projected to grow at a rate of 12.8 per cent during the Plan. The strategy to expand this will include innovative pricing. Escalation in freight rate for parcel traffic should be based on the Wholesale Price Index and increase in the cost of fuel. Concessional pricing based on marginal costing principle can be tried out for parcel express trains in empty flow direction. Differential pricing is needed for different types of parcel services, especially for use of passenger trains using parcel vans. This will help Railways to shift parcel traffic from passenger trains to exclusive Parcel Express trains.

15.50. The Parcel business will be expanded apart from the other initiatives, with the help of capacity augmentation. This will involve the following:

Increase in rake loading; Introduction of High Capacity Parcel Vans; Development of dedicated parcel terminals; Mechanisation of handling; Provision of end logistics with value added services; Introduction of premium super fast parcel express services between major production and consumption centres with guaranteed transit and assured supply on the nominated day of loading; and Computerisation of Parcel Management System

Expansion of Fixed Assets

15.51. The targets for creation of fixed assets during the Twelfth Plan have been shown in Table 15.15. Upgradation of balance 1,575 RKM of Iron Ore route for 25 tonnes of axle load (5,425 km done in the Eleventh Plan) and upgradation of Feeder Routes of DFC to run 25 tonnes of axle load will be the areas of focus.

15.52. It is planned to undertake 19,000 km of track renewals including 1,500 km renewal for replacement

TABLE 15.15
Creation of Fixed Assets during the Twelfth Plan

	Eleventh Plan Actuals (Km)	Twelfth Plan Physical Target (Km)
New Line	2,205	4,000
Eastern and Western Dedicated Freight Corridor	Work in Progress	3,338 (Double line except 400 km)
Gauge Conversion	5,290	5,500
Doubling	2,756	7,653
Railway Electrification	4,501	6,500

of 52 kg rails with 60 kg rails on Group A routes. During the Plan, 17,500 km of renewal will become due apart from 3,500 km which is due at the beginning of the Plan.

Dedicated Freight Corridors (DFCs)

15.53. Two Dedicated Freight Corridors (Box 15.3) are expected to be commissioned by March 2017.

Rolling Stock Requirement

15.54. With the expansion of the freight network and passengers demand, the requirement of rolling stock will increase substantially (Table 15.16).

15.55. A range of technological solutions are being implemented for improving the quality of wagons, coaches and locomotives. Some of the measures planned in this regard include transfer of technology from USA for track-friendly bogies of advanced technology capable of carrying enhanced axle loads of 25 tonnes and higher axle loads while exerting lesser forces on the track. Keeping the huge demand for passenger travel in mind, it has been planned to have a complete switchover to new manufacture of only LHB design coaches by the end of Twelfth Plan. This will help in introduction of AC/non-AC trains at speeds more than 130 kmph by induction of LHB design coaches and raise the crash worth quotient of coaching stock on Indian Railways through larger deployment of LHB coaches and incremental

Box 15.3

Dedicated Freight Corridors (DFCs) – A Game Change for the Indian Rail Sector

The Dedicated Freight Corridors on the Western and the Eastern routes is a strategic capacity augmentation initiative taken by Railways and involves construction of 3,338 kms of dedicated freight lines to carry predominantly coal and steel on the Eastern corridor and containers on the eastern corridor. The ports in the Western region covering Maharashtra and Gujarat would be efficiently linked to the Northern hinterland and similarly on the Eastern side, coal would move to the power plants in the North. The Project completion cost is estimated at ₹95,860 crore. A major part of the project is being financed through multilateral/bilateral debt. World Bank funding of part of Eastern DFC is estimated at US \$2.73 billion (₹13,625 crore) and JICA funding of 504 billion Yen (₹31,486 crore). Dankuni–Sonmargar section of Eastern DFC (₹10,022 crore) is to be implemented through PPP. The balance requirement would need to be met through Budgetary Support. Both Eastern and Western DFCs are targeted for completion in the terminal year of the Twelfth Plan.

Dedicated Freight Corridor can be justifiably called an innovation in rail transport in India because of a number of reasons. The average speed of freight trains will go up from 25 kmph to 70 kmph which will reduce the transit time by less than half from the present levels.

Railway technology would get a major up-gradation with the help of heavy hauled freight trains of 15,000 tonnes capacity and 1,500 meters length. The axle loads of DFC routes will also go up from 25 tonnes to 32.5 tonnes which would enhance the track loading capacity from 8.67 tonnes per meter to 12 tonnes per meter. Wagons with much better pay load to tare ratio would also get introduced through this technology. Newer technology in signaling, train communication, track-maintenance and operations would get introduced in the Indian Railways system. The capacity released by freight trains can be used for running more passenger trains at higher speeds after upgrading the existing mixed corridors of Indian Railways.

In addition, this initiative is expected to offer significant reduction of Green House Gas (GHG) emissions in transport sector of India.

Pre-feasibility studies have also been completed on the four new Freight Corridors, viz. North-South, East-West, East-South and Southern corridors and Preliminary Engineering cum Traffic Survey is being undertaken by RITES. Based on the outcome of the PETS a beginning would be made in the Twelfth Plan in implementation of the new corridors in a phased manner.

TABLE 15.16
Rolling Stock Requirement during the Twelfth Plan

Type of Stock	Requirement* on Additional Account (2012–13 to 2016–17)	Requirement** on Replacement Account (2012–13 to 2016–17)	Total Requirement (2012–13 to 2016–17)	Anticipated Acquisition 2012–2017
Coaches	25,440	7,626	33,066	24,000
Diesel Locos	1,500	500	2,000	2,000
Electric Locos	1,800	210	2,010	2010
Wagons (in Vehicle Units)	76,396	29,263	1,05,659	1,05,659

* Requirement of coaches includes EMUs, MEMUs and DEMUs.

** Requirements on replacement account for all rolling stocks are based on actual over age arising and the trend of average condemnation.

enhancement in ICF coaches. In case of locomotives higher horsepower capacities and more fuel efficient technologies are being inducted (see Box 15.4).

15.56. With new sections in BG coming on the Indian Railways network either due to gauge conversion or due to new lines, need for branch line operations of passenger trains is increasing. This is best addressed by DEMUs since they are low cost, do not require massive infrastructural investments and they release locos for freight and passenger operations on main line. With a new factory coming up at Haldia which is slated to manufacture up to 400 DEMU coaches per annum, there would be possibility of large scale deployment of DEMU services in the North East, North Bihar, Eastern and North Eastern UP, Gujarat, J&K and many other far-flung areas of the country. Similarly for the electrified sections,

EMU/MEMU services would be enhanced with enhancement of technology. A factory is being set up at Kachrapara for manufacturing EMUs/MEMUs and Kolkata Metro coaches which will be operational during the Twelfth Plan.

Signalling and Telecom

15.57. Initiatives in Signalling and Telecom will include deployment of proven and reliable on-board train protection system, isolation of run-through line and provision of complete track circuiting of station sections, and computerised real time monitoring of assets and use of conditions based productive maintenance system. It is also envisaged to increase Line Capacity through use of suitable technology options, viz. Automatic Block Signalling, Intermittent Block Signalling, Automatic Train Control with Cab Signalling, Integrating Train Controlling and

Box 15.4 New Generation Locomotives

Ministry of Railways is planning to set up a factory with a foreign partner selected through international competitive bidding for supply of 12,000 HP Electric Locomotives. This will be a major jump over the current 6,000 HP locomotives. During the ten-year period of supply programme, the proposed factory at Madhepura will supply 800 electric locomotives with performance guarantees based on international best practices. This locomotive will have very high energy efficiency and will constitute a part of India's response towards mitigation of the emission of green-house gases. Successful execution of this project by the JV route will usher Indian Railways into a new era of reforms and will provide impetus to PPP funding of railway projects.

Ministry of Railways is also procuring 200 number, 9,000 HP electric locomotives under the JICA loan for Western DFC. These locomotives would be mainly used for container train operations on the Western DFC.

A factory is also planned at Marowhra for manufacture of diesel locomotives with a capacity of 5,000 HP as against current usage of 4,000–4,500 HP by the Indian Railways. The Madhepura and Marowhra factories are likely to be awarded during 2012–13.

Signalling System; and switch over to systems and equipment of higher reliability and safety levels and built in design redundancy.

New and Renewable Energy Projects

15.58. It is proposed to develop renewable energy projects and have strategies for more clean energy in the total consumption basket. Some of the strategies in this regard will include: Grid connected Solar Panels at major stations; Provision of roof top Solar Panels on passenger coaches running in Close Circuits; Provision of solar Panels, Solar Water heaters, Solar Pumps and so on. in Hospitals, Running Rooms, Rest Houses; and LED based lighting and Display Systems. In addition to above, it is also proposed to develop wind energy for meeting the above requirements.

Safety Performance

15.59. There are 14,896 unmanned and 17,839 manned level crossings on Indian Railways network as on 1 April 2011. These level crossings contribute to 30 per cent of fatalities in Railway mishap and statistically contribute to about 40 per cent of accidents of Indian Railways. Accordingly, Indian Railways Vision: 2020 envisage elimination of all unmanned level crossings by provision of subway, diverting road traffic from unmanned level crossing gates to existing ROB/RUB and manned gates by constructing diversion road, closure of very low Train Vehicle Units (TVU) gates, manning of unmanned level crossing gates; upgradation of infrastructure, provision of interlocking of gates, lifting barrier and so on, in the next five years. Railways also envisage provision of ROB/RUB in lieu of manned level crossings with heavy traffic density (high Train Vehicle Units that is above one lakh in about 2122 in number and those level crossings located in station yard/limits about 842 in number). Railways have also planned to eliminate level crossings along the Eastern and Western DFC network. It has been decided to replace level crossings with TVU>50,000 with ROB and TVUs<50,000 with RUBs. Elimination of level crossings will require General Budgetary Support to Railways for this work. Above works will help in

achieving zero accidents at level crossings, minimum detention to road and punctual train operation.

15.60. Railways have prepared a Corporate Safety Plan, 2003–13. Railways have also appointed a High Level Safety Review Committee (Kakodkar Committee) for suggesting measures on Railways safety which has submitted its report. Their recommendations will also be considered during the Plan for strengthening overall safety environment of the Railways. According to this report, the present safety environment on Indian Railways is inadequate largely due to poor infrastructure, paucity of resources and lack of empowerment at the functional level. The committee has recommended setting up of a statutory Railway Safety Authority. The Committee has also recommended adoption of Advance Signaling System based on continuous track circuiting and cab signaling similar to European Train Controlling System Level-II and total elimination of all level crossings within five years. Following key areas related to safety will need to be taken up during the Plan:

1. Development of Train protection and Warning System (TPWS) and Anti Collision Device (ACD)/Train Collision Avoidance systems (TCAS).
2. Provision of improved safety systems with audio visual warning to road users in advance of approaching trains.
3. For moving towards a fault tolerant zero defect regime, computerised real time monitoring of assets and use of condition based in predictive maintenance systems shall be necessary.
4. Development of 'crashworthy' structural design capable of absorbing high impact loads in unfortunate case of collision/accidents.
5. All the furnishing materials in the coaches to have superior fire retardant properties in line with international norms.
6. Mobile Communication and Train Radio Communication (MCTRC).
7. Replacement of 2,000 km of overhead alignment which is an outdated technology for block and control working.

8. Provision of Biometric VCD (Driver's Vigilance Telemetry Control System).
9. Provision of Intelligent fire surveillance and Extinguishing system of locos.
10. Provision of GPS-based fog safe device

Developing High Speed Rail Corridors and Upgradation of Speeds

15.61. Ministry of Railways has selected following six corridors for conducting pre-feasibility studies for development of High Speed Rail Corridors: Delhi–Chandigarh–Amritsar (450 km); Pune–Mumbai–Ahmedabad (650 km); Hyderabad–Dornakal–Vijaywada–Chennai (664 km); Chennai–Bangalore–Coimbatore–Ernakulam–Thiruvananthapuram (849 km); Howrah–Haldia (135 km); and Delhi–Agra–Lucknow–Varanasi–Patna (991 km). The viability of each corridor identified for pre-feasibility study is being examined by consultants. Efforts are being made to complete all such studies, undertake at least two Detailed Projects Reports and develop one corridor of about 500 km for construction.

15.62. It is also proposed to set up a National High Speed Rail Authority (NHSRA), an autonomous body through a Bill in Parliament for implementation of High Speed Rail Corridor projects of Indian Railways. This authority will be entrusted with the work of planning, standard setting, implementing and monitoring these projects.

15.63. It is planned to undertake civil and signaling works to support faster movement of trains on few selected routes. This will enable increase in speed

to 130–140 kmph in certain routes and 160 kmph in Delhi–Mumbai and Delhi–Howrah to be further upgraded to 200 kmph.

Public Private Partnerships (PPP)

15.64. Investments in Railways can be stepped up with the help of PPP. So far, such investments have been extremely small. Private investment mobilisation in the Eleventh Plan is likely to be to the tune of 4 per cent of the Plan Outlay. This is far less compared to the Private Capital share in other sectors like Ports – 80 per cent, Telecom 82 per cent, Electricity 44 per cent, Airports 64 per cent and Roads 16 per cent. PPP Projects related to rolling stock manufacturing units, modernisation of railway stations, multi-functional complexes, logistics parks, private freight terminal, freight train operators, liberalised wagon investment schemes, Dedicate Freight Corridors and so on which are in pipeline offer excellent opportunities for private investment. These need to be speedily executed in the Twelfth Plan (Box 15.5).

Tariff and Prices

Tariff Structure

15.65. The tariff structure in Railways is seriously distorted because passenger fares are kept very low and freight fares are increased to cross-subsidise the low level of passenger tariff. Table 15.17 below indicates Indian passenger fares compared with other countries and Table 15.18 compares the freight rates.

15.66. Indian passenger tariffs are one-fourth of China and are one-ninth of Russia. They are nearly one-twentieth of Japan. Even in Purchase Price

Box 15.5

Public-Private Partnership (PPP) in Railways

As on date, the Indian Railways have a large shelf of on-going projects whose completion would require about ₹2,25,000 crore. The magnitude of the task is huge and any neglect of the same is bound to lead to severe capacity limitations adversely affecting the competitiveness and growth of the Indian Railways.

It is estimated that the Indian Railways would not be able to generate sufficient funds internally, through borrowings and from budgetary support for meeting the investment requirements of the Twelfth Five Year Plan. The shortfall would be met through private investments in PPP projects. Additional investment from private sector is also expected through their investments in manufacturing facilities created as a consequence of partnerships with IR. Together it is expected that investments of about ₹1 lakh crore would be made by the private sector during the Twelfth Five Year Plan on traffic facilities, other electrical works; workshops including PSUs, passenger amenities; investment in PSUs/JVs/SPVs, and so on.

TABLE 15.17
Passenger Service Yields in some Major Economies

Country	Passenger Service Yield US Cents/ Passenger-KM at nominal prices	Passenger Service Yield US Cents/Passenger-KM adjusted for PPP (India=1)
India	0.6	1.0
China	2.4	2.7
Russia	5.2	6.7
Japan	19.0	9.4
Germany	12.6	6.2

Source: World Bank (2012): Railways International Overview: Issues for India.

Parity terms, the tariffs bear no comparison. In terms of freight rates, however, the Indian freight rates are the highest whereas those of China, Russia and the USA are 58 per cent, 75 per cent and 51 per cent of the Indian rates adjusted for PPP. Even in nominal terms, Chinese freight rates are only around 72 per cent of the Indian freight rates.

15.67. The low passenger fares, which have not been revised for several years, have led to huge losses in passenger traffic operations estimated at ₹22,000 crore in 2011–12. Unless the trend is arrested by rationally linking passenger fare to input costs, the Railways will be out priced in the freight market and would find it unsustainable to run the Railway operations.

15.68. In the passenger service segment, suburban services contribute almost 54 per cent in number of passengers over the IR's total passenger traffic. Their earning share is, however, only 7.13 per cent (2009–10). The losses suffered in the segment during 2008–09 and 2009–10 were ₹1,651.19 crore and ₹2,214.06 crore respectively. In view of the rising input costs, the suburban fares need to be revised and the level of subsidies gradually reduced in line with the proposed indexation of lower class fares.

Tariff Regulatory Authority and other reforms

15.69. In the earlier Plans, it had been suggested that a Tariff Regulatory Authority may be set up to fix up

TABLE 15.18
Freight Yields in some Major Economies

Country	Freight Yield US Cents/Total Tonne-KM at nominal prices	Freight Yield US Cents/Total Tonne -KM adjusted for PPP (India=1)
India	2.11	1.00
China	1.49	0.58
Russia	2.20	0.75
USA	2.28	0.51

Source: World Bank (2012): Railways International Overview: Issues for India.

tariffs both for passenger and freight. It has, however, so far not been possible. It has to be realised that with the coming up of more PPP projects, the need has become more pressing. The Tariff Regulatory Authority like the regulators in the other sectors will recommend the tariff structures consistent with the level of cross-subsidies feasible.

15.70. Numerous reports have mentioned the need to undertake organisational reforms in the Railways (see Box 15.6). The current departmental organisation of the Railways is not conducive to the running of railways as an economic and business enterprise, and towards executing the necessary changes to overhaul the service. The Railway Board should be re-organised along business lines, in contrast with the current division between the various disciplines, electrical, mechanical, traffic and so on. This view has also been strongly endorsed by the Kakodkar and Pitroda Committees. Early adoption of standard business accounting policies will necessitate adequate appropriations to depreciation reserves on a predictable, systematic and transparent basis.

Financing of the Twelfth Plan

15.71. The Plan will require large investments to achieve its objectives. The estimated resources required are ₹5,19,221 crore including GBS of ₹1,94,221 crore, IEBR of ₹2,25,000 crore and private sector investment of ₹1,00,000 crore.

Box 15.6**Key Message from Reports on Railways: The Need for Organisational Reforms**

In the past decade or so, a number of reports have been presented related to the rail sector. The Indian Railways Expert Committee Report (2001) recommended significant organisational changes including corporatisation of the Indian Railways and a new investment programme to achieve high traffic and revenue growth along with improvement in safety performance. Indian Railway's Vision 2020 (2009) is an aspirational plan which charts out a growth of 10 per cent for the Railways over the next 10 years by developing a sharper commercial focus with strong social commitment. Recently in February 2012, two more reports have been submitted. The Expert Group on modernisation of Indian Railways (Pitroda Committee) has unequivocally stated that Indian Railways are in urgent need of modernisation and generational change to ensure safety, improve productivity, take advantage of advances in technology and respond to ever increasing demand in order to meet the inclusive growth aspirations of the country. The High Level Safety Review Committee (Kakodkar Committee) was also presented in February 2012. All these reports have recommended organisational reforms in the Railways.

15.72. Some major initiatives in the Twelfth Plan are:

- Twelfth Plan would target to enhance rail share in freight traffic by at least 2 per cent.
- The Eastern and Western Dedicated Freight Corridors would be completed during the Twelfth Plan period and planning for other DFCs—North-South, East-South, East-West and South-West may be firmed up during the Twelfth Plan period.
- The Twelfth Plan would focus on five areas—track, bridges, signalling and telecom, rolling stock and station and freight terminals which would lead to safety, decongestion, capacity augmentation and modernisation of system creating more efficient, faster and safer railways.
- Signalling system would be modernised with provision of advanced technological features and development of Train Protection and Warning System (TPWS), Anti Collision Device (ACD), Trains Collision Avoidance System (TCAS), GPS-based Fog Safety Device and Biometric Drivers Vigilance Elementary Control System.
- Phased elimination of all unmanned level crossings by provision of subway, ROB/RUBs, constructing diversion roads, and so on.
- Expansion of Long Haul trains using distributed power system.
- Improvement in the design and technology of wagons, coaches and locos through acquisition as well as investment in R&D along with induction of latest technology in rolling stock by encouraging expansion in capacity of manufacturing units through PPP.
- Developing High Speed Rail corridors and Setting up National High Speed Rail Authority (NHSRA) as an autonomous body for planning, standard setting, implementation and monitoring of high speed corridors.
- Promoting private investment in special purpose high capacity wagons under the Liberalised Wagon Investment Scheme (LWIS) and Encouraging private freight operators to transport select commodities where railway modal share is low, that is automobile, un-bagged cement and fertiliser, fly ash, edible oils, and so on.
- Activity Based Accounting to facilitate managerial decision making and to establish profit/loss making routes/activities.
- Correcting the imbalance between passenger and freight traffic by setting up a Tariff Regulatory Authority to suggest tariff structures consistent with the level of feasible cross-subsidies.
- Resolution of regulatory issues regarding CONCOR and private players and further expansion of containerisation.
- Reorganisation of Indian Railways on business lines, hiving off non-transportation tasks and separation of policy making and operational responsibilities of the Railway Board.

ROADS

15.73. India has one of the largest road networks in the world, consisting of (i) national highways (NHs), (ii) state highways (SHs), (iii) major district roads (MDRs) and (iv) rural roads (RRs) that include other district roads and village roads. The NHs with a

length of 76,818 km comprises only 2.0 per cent of the road network but carry 40 per cent of the road-based traffic. The SHs and the MDRs together constitute the secondary system of road transportation which contribute significantly to the development of the rural economy and industrial growth of the country. The secondary system also carries about 40 per cent of the total road traffic, although it constitutes about 13 per cent of the total road length. At the tertiary level are the Other District Roads (ODRs) and the Rural Roads (RRs). These, once adequately developed and maintained, hold the potential to provide rural connectivity vital for generating higher agricultural incomes and productive employment opportunities besides promoting access to economic and social services.

15.74. In recent years special efforts have been made by the central government to strengthen the National Highway and also to improve rural road connectivity. Despite this, the road network remains grossly inadequate in various respects. It is unable to handle high traffic density and high speeds at many places and has poor riding quality. It is necessary to accelerate completion of ongoing projects, including expressways besides speedy implementation of the Golden Quadrilateral (GQ) and the North-South and East-West (NS-EW) corridors and also to address the deterioration of large stretches of the NHs.

Review of the Eleventh Plan

15.75. Against an outlay of ₹1,92,428 crore in the Eleventh Plan for the road sector, the anticipated expenditure was ₹1,58,077 crore (at current prices). The scheme-wise and year-wise outlay and expenditure are given in Annexure 15.1.

National Highways (NHs)

15.76. At present, out of 76,818 kms of National Highways about 23 per cent length is of 4-lane (and above standard), 54 per cent length is of 2-lane standard and 23 per cent length is of single and intermediate standard. As on March 2012, 30,537 km length of NHs was entrusted to NHAI, 42,483 km to State PWDs and 3,798 km to BRO. Plan-wise details of increase in the NHs network are enclosed

(Annexure 15.2). An overview of the physical targets and achievements of normal NH works, Border Roads Development Board (BRDB) works, and works by the NHAI during the Eleventh Plan period is enclosed (Annexure 15.3)

15.77. Despite the progress in NHs, only 23 per cent of their total length is wider than two lanes, leading to heavy congestion. Shortfall in construction of bypasses, inadequate capacity, insufficient pavement thickness, and weak, narrow, and distressed bridges/culverts as well as ROBs are some of the other deficiencies.

National Highway Development Programme (NHDP)

15.78. India's road network has benefited greatly from the NHDP programme which envisages an investment of about ₹2,36,247 crore during the period 2005–12. Although NHDP envisaged award of concessions/contracts by the year 2012, the actual completion of the programme was expected to be accomplished only by the end of the Twelfth Plan. Phase-wise progress of NHDP during the Eleventh Plan is given in Table 15.19 and details of various phases are given in (Table 15.20). A map showing these details is given at Annexure 15.4.

Financing of National Highway Development Programme (NHDP)

15.79. Development and maintenance of National Highways is financed through various sources. Details are given in Box 15.7.

TABLE 15.19
Physical Achievements under NHDP during the Eleventh Five Year Plan

NHDP	Total length completed (km)*
NHDP Phase I	639
NHDP Phase II	5,210
NHDP Phase III	3,599
NHDP Phase V	913
NHDP Phase VII	13
Other Projects	235
Total	10,609

* Up to 31 March 2012 (Provisional).

TABLE 15.20
Progress of NHDP up to 30 April 2012

Total length (km)	GQ	NS&EW	NHDP Ph.-III	NHDP Ph.-IV	NHDP Ph.-V	NHDP Ph.-VII	Other NHs
	5,846	7,142	12,109	14,799	6,500	700	1,383
Completed Total till date (km)	5,840	6,018	3,798	–	940	14	961
Under Implementation							
Length (km)	6	691	2,802	3,318	1,181	27	409
Contracts (Nos.)	8	66	56	23	15	2	5
Letter of Award issued/Agreement signed and Work to be started							
Length (km)	12	3,669		1,866			0
Contracts (Nos.)	1	36		12			0
Total							
Length (km)	6	703	6,471	3,318	30,47	27	409
Contracts (Nos.)	8	67	92	23	27	2	5
Length to be awarded							
Length (km)	0	421	1,840	1,1481	2,513	659	20

Box 15.7
Financing of National Highway Development Programme (NHDP)

- Gross Budgetary Support (GBS) and Additional Budgetary Support (ABS).
- Dedicated accruals under the Central Road Fund. Present rate of cess is ₹2.00 per litre on both petrol and diesel. A part of this cess is allocated to NHAI to fund the NHDP.
- External Assistance through World Bank, ADB, JBIC, and so on.
- Ploughing back of toll revenue including toll collection, negative grant, premium and revenue share deposited by NHAI into Consolidated Fund of India and equivalent amount to be released to NHAI for ploughing back in its projects.
- Private Sector Investment under Public Private Partnership (PPP) frameworks that is BOT-(Toll) BOT(Annuity), Special Purpose Vehicle (SPV)- with Equity participation by NHAI.
- Market Borrowings by NHAI as authorised by GOI to bridge the gap between the available resources and funds requirement.

Roads Under SARDP-NE

15.80. To promote the development of road network in the North-East, a Special Accelerated Programme for Road Development in North-East (SARDP-NE) was taken up in two phases. Under Phase 'A' of SARDP-NE approved by the Government, improvement of about 4,099 km length of roads (2,041 km NHs and 2,058 km State roads) is envisaged. The SARDP-NE Phase-A was targeted for completion by March 2014. However, it is expected to be completed by March, 2015. Under Phase 'B' of SARDP-NE Programme, covering 3,723 km (1,285 km NH and 2,438 km State road), have been approved for DPR preparation. So far DPRs of about 450 km has been completed. About 892 km (21.8 per cent) length has

been completed under SARDP-NE Phase-A till end March 2012.

15.81. Part of SARDP-NE is the Arunachal Pradesh Package for Road and Highways involving development of about 2,319 km length of road (1,472 km is NHs and 847 km is State/General Staff/Strategic roads) has also been approved by the Government. Projects for 776 km are to be taken up on BOT (Annuity) mode and the balance 1,543 km is to be developed on EPC basis. The entire Arunachal Pradesh Package is targeted for completion by June 2016. Out of the BOT (Annuity) Projects, 3 Projects have been awarded for 369 km costing ₹3,126 crore; balance 407 km costing ₹1,985 crore is in the process

of award. In case of EPC Projects, out of the sanctioned 359 km, 143 km is under process for sanction and DPRs are under preparation for balance 928 km. Target for award of all civil works is March, 2012. So far during 2011–12, 10 km of road has been completed.

Roads for LWE Districts

15.82. A programme for development of about 1,202 km of National Highways and 4,362 km of State Roads in Left Wing Extremism (LWE) affected areas as a special project costing about ₹7,300 crore has been taken up. The programme is slated for completion by March, 2015. The projects cover 34 districts in eight States, namely Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh. So far, 178 number of works containing a road length of 4,967 km costing ₹6,637 crore have been sanctioned. Out of these, 157 number of works containing a road length of 4,181 km estimated to cost ₹5,270 crore have been awarded and remaining are at various stages.

National Highways Outside NHDP Programme

15.83. Physical progress of Non-NHDP National Highways during Eleventh Plan is given in Table 15.21.

15.84. Procurement of public funded projects has witnessed a paradigm shift and now there is a shift towards EPC mode of procurement instead of the traditional mode of item rate contract (Box 15.8).

Box 15.8 Engineering, Procurement, Construction (EPC) Contract

The conventional item-rate contracts are generally prone to time and cost overruns, particularly in the National Highway sector, resulting in enhanced cost to the exchequer, as also considerable delays in the completion of projects. Developed countries have moved to Engineering, Procurement and Construction (EPC) contracts where the contractor is responsible for design and construction on a turnkey basis and for a fixed price. The Planning Commission has published a model Engineering, Procurement and Construction (EPC) contract for Highways. It is expected that about 20,000 km of 2 lane National Highways would be developed under this model. A similar document is also being prepared for Dedicated Freight Corridor of the Indian Railways.

State Highways (SHs) and Major District Roads (MDRs)

15.85. Investments including PPP under VGF programme of central government have been made by the State Governments to expand the networks of roads, especially state highways, which are part of the secondary and territory network. This has resulted in expansion of the road network as shown in Table 15.22.

15.86. It has been found that many State roads suffer from low investment, inadequate width of carriageway to meet traffic demand, weak pavement and bridges, congested stretches passing through

TABLE 15.21
Physical Progress of Non-NHDP NHs during Eleventh Five Year Plan

Sl. No	Category	Total Completion of Works from 2007–08 to 2010–11		2011–12 (Provisional)	
		Target	Achv.	Target	Achv. (Up to March 2012)
1	Missing Link (km)	59.4	55.3	—	—
2	Widening to 2-lanes (km)	4,533	4,379	1,070	727
3	Strengthening (km)	3,554	3,950	1,080	672
4	Improvement of Riding Quality (km)	7,769	9,321	1,672	2,367
5	Widening to 4-lanes (km)	301.5	267	104	74
6	Bypasses (No.)	32	13	7	7
7	Bridges /ROBs (No.)	518	388	129	87

TABLE 15.22
State Roads Progress during the Eleventh Plan

	Lane wise Length of SH in 2007 (km)				Lane wise Length of SH in 2011 (km)			
	Total Length	SL/IL	2 Lane	4 Lane and above	Total Length	SL/IL	2 Lane	4 Lane and above
States	1,50,492	1,11,850	36,349	2,293	1,65,724	1,00,819	60,747	4,157
UTs	221	145	56	20	405	230	63	112
Total	1,50,713	11,995	36,405	2,313	1,66,129	1,01,049	60,811	4,269

cities/towns, poor safety features and road geometrics, and inadequate formation width in hilly and mountainous regions, missing links and bridges and several railway level crossings requiring urgent replacement with ROB/road under bridge (RUB) to improve safety and faster traffic movement. A broad assessment shows that over 50 per cent of SHs and MDRs network have poor riding quality. According to one assessment, annual losses due to poor condition of these roads would be around ₹6,000 crore. Many policy and implementation deficiencies have to be redressed. These include: thin spreading of resources; delay in pre-construction activities due to delay in land acquisition; delay in environmental clearance and shifting/removal of utilities; weak management by contractors due to improper deployment of human resources and equipment; and poor implementation capacities of the state Public Works Departments (PWDs).

Road Maintenance

15.87. The road network built at a huge cost needs to be maintained properly to prevent disintegration and deterioration, ensuring its continuous utilisation in an optimum manner and road safety of its users. However, maintenance of roads, is treated as a non-Plan activity and has, therefore, tended to be neglected because of financial resources constraints. The maintenance requirement of the high density corridors of NHs under construction and post-implementation is provided by the NHAI. However, the non-NHDP NH sections, which are maintained by State PWDs, are poorly managed, primarily because funds made available to them for maintenance are well short of the requirement as per norms. According to an estimate, the NHs get only 50 per cent of the total funds required for

proper maintenance of NHs. Maintenance of SHs and MDRs has also been suffering from paucity of resources made available for the purpose. For rural roads under PMGSY, there is provision for maintenance for five years following the completion of a project but the long-term issue of maintenance beyond the initial five year period has not been addressed so far. Besides inadequacy of resources, management of roads is unsystematic and inspections are irregular. There is weak accountability and poor monitoring of the maintenance activities.

Public–Private Partnership (PPP) Projects

15.88. During the Eleventh Plan, total private-sector investment on NHDP has been ₹62,629 crore against a target of ₹86,792.00 crore, which is a substantial jump over the achievement in the Tenth Plan of ₹11,032 crore (2011–12 prices) Appropriate policy and regulatory framework for the PPPs, including institutional mechanisms are put in place such as the Model Concession Agreement (MCA) for BOT projects.

Pradhan Mantri Gram Sadak Yojana (PMGSY)

15.89. Empowering rural India through the strategic provision of all-season road access has emerged as one of the key priorities for the Government of India. The Eleventh Five Year Plan (2007–12), and the Tenth Plan before it, recognised that rural connectivity is a key component of rural development and poverty alleviation in India. The main mechanism for enhancing rural connectivity in a more systematic way has been the Pradhan Mantri Gram Sadak Yojana (PMGSY), a Centrally Sponsored Scheme (CSS), launched on the 25 December 2000. The programme seeks to connect all habitations with a population of 500 persons and above in plain areas

and 250 persons and above in Hill States, Tribal (Schedule V) areas, the Desert Areas (as identified in Desert Development Programme) and in the 82 Selected and Tribal Backward districts (under IAP) as identified by the Ministry of Home Affairs/ Planning Commission. The Government of India has also identified 'rural roads' as one of the six components of 'Bharat Nirman' with a goal to provide connectivity to all habitations with a population of 1,000 persons and above in plain areas and 500 persons and above in hilly or tribal areas with an all-weather road.

15.90. The physical and financial progress of PMGSY upto the end of Eleventh Plan is presented in Tables 15.23 and 15.24. Although the PMGSY has achieved only 53 percent of its initial targets—mainly due to limited implementation capacity—its achievements have been significant. The length of the new and improved rural road network under the program to date has reached 2,09,500 km and as a result 84,414 habitations have been connected. The main strength of the PMGSY programme has been its ability to develop a strong national focus for rural roads development through the National Rural Roads Development Agency (NRRDA). The NRRDA has developed a common set of operating procedures that are applied nationwide through the dedicated State Rural Roads Development Agencies (SRRDAs) and their Program Implementation Units (PIUs). These operating procedures are set out in a series of PMGSY manuals covering overall operations, technical design, quality control and accounting. There is a systematic planning process in place which has included the prioritisation of a 1.5 million km core rural road network, of which about 750,000 km are eligible for new connectivity and upgrading under the PMGSY programme. The programme has also developed a web-based On-line Monitoring Management and Accounting System (OMMAS) which is accessible to the public.

15.91. Evidence from several impact evaluation exercises on PMGSY indicates the multiple benefits generated in the rural economy in both commercial and social spheres by improving road connectivity. A study by Bell (2012)¹ examines the contribution

TABLE 15.23
Physical Progress—PMGSY (as on 31 March 2012)

	Total Eligible	Sanctioned	Completed
Habitations (in Nos.)	1,58,891	1,14,963 (72%)	84,414 (53% of eligible)
New Connectivity length (km.)	3,67,673	2,79,811 (76%)	2,09,570 (57% of eligible)
Upgradation length (UG) (km.)	3,74,844	1,64,096 (73%)	1,40,930 (62% of eligible)
	1,49,733–Renewal	(UG)	(UG)

TABLE 15.24
Financial Progress (as on 31st March, 2012)

	(₹ crore)	
Value of Proposals Sanctioned	Funds Released	Expenditure Incurred
127786	1,00,417	91,498

of PMGSY in drawing India's villages into the mainstream, in three ways. First, with improved connections to markets, villagers should face more favourable prices for inputs and outputs. Second, by reducing the time spent travelling to school and the days lost due to bad weather, an all-weather road should improve the attendance, not only of pupils, but also of their teachers, thus promoting the formation of human capital and the growth of productivity over the long run. Third, by improving the villagers' access to timely treatment, especially in emergencies, the connection should lower mortality and morbidity.

15.92. Bell (2012) attempts to estimate the relative sizes of each of these respective contributions to total benefits from PMGSY. The author finds that providing backward rural areas with all-weather roads promotes not only production and trade in what can be called the 'commercial' sphere of life, but also the formation of human capital and health in the 'non-commercial' one. In a further analysis², he along with his co-author undertakes a cross section comparison of 30 villages (nine of which benefited from PMGSY) and 'before and after' comparisons in these nine villages. The authors find that net output prices

were 5 per cent or higher; substantially fewer days of schooling were lost due to bad weather, largely because teachers had fewer absences. The improvement in the accessibility to education resulted in increased school enrolment and school attendance. Importantly, there was an increase in the number of girls going to schools. The acutely sick received more timely treatment and were more likely to be treated in a hospital than in the nearest primary health clinic in villages connected by PMGSY. Better management of infectious diseases and attending to emergencies due to faster access to health facilities and increase infrequency of visits by health workers were the other outcomes. Moreover, there was an increase in the number of institutional deliveries in hospitals outside the village, improvement in ante-natal and post-natal care and a decline in infant and child mortality.

15.93. Several independent impact evaluation exercises commissioned by the Ministry of Rural Development have also revealed the huge benefits in terms of agricultural growth, income and employment generation, access to healthcare and education, and poverty reduction generated by PMGSY. Better connectivity resulting in easier access to markets and improved flow of information led to improvements in agricultural production and incomes of the farmers inhabiting the connected area. Considerable change in cropping pattern was observed, with a shift from food crops to cash crops. Non-farm opportunities like opening of shops, small business, cottage industries increased and more avenues for self-employment emerged. Besides, road connectivity led to expansion of local industries, which in turn generated employment opportunities. The construction of the PMGSY road also led to an increase in frequency of visits by Government officials. This is likely to result in better implementation of various Government schemes and programmes.

Bharat Nirman

15.94. Under Rural Connectivity component of Bharat Nirman, all habitations having population of 1,000 or more persons (500 or more in hilly and tribal areas) are to be provided connectivity with all-weather roads. Accordingly, the programme

envisages to provide connectivity to 63,940 habitations under above category. Projects to connect 58,387 habitations have been sanctioned and 44,089 habitations connected by constructing 1,41,095 km of new roads up to 31 March 2012. Also 1,03,471 km of roads were upgraded (excluding renewals by States) (Tables 15.25 and 15.26).

TABLE 15.25
Habitation Coverage – Bharat Nirman
(as on 31 March 2012)

	Total Eligible	Projects Cleared (Sanctioned)	Completed
Habitations (in numbers)	63,940	58,387 (91%)	44,089 (69% of eligible)

TABLE 15.26
Cumulative Physical Progress under Bharat Nirman
(up to March 2012)

Activity	Target (2005–12)	Achievement
New Connectivity (Length in km.)	1,89,897	1,41,096 (74%)
Up-gradation including renewal (in kms)	1,94,131	2,35,903 (122%)

The Twelfth Plan

15.95. The Twelfth Plan will have to continue the thrust of upgrading the road infrastructure, with the objective of improving mobility and accessibility while reducing the cost of transportation. The main targets of the Twelfth Plan will be as follows:

1. Completion of on-going works on Golden Quadrilateral and North–South and East–West corridors taken up in NHDP Phases I and II of the programme. The balance works remaining are marginal and will get completed in the first two years of the Plan.
2. In respect of the remaining phases of NHDP, namely NHDP-III for inter-district roads and other roads taken up under the programme and NHDP-IV which aims to convert single-lane roads to double-lane roads, the programmes will be taken up for completion in the Twelfth Plan.
3. Similarly, NHDP-V which involves conversion of the GQ to six-lane roads now will be

continued in the Twelfth Plan and specific targets set for completion.

4. National and State Highways would be upgraded to minimum two lane standard by the end of the Plan.
5. All villages will be connected with all-weather roads by the end of the Plan.
6. Work on access controlled expressways has moved at a slow pace. A comprehensive master plan for development of 15,600 km of expressways would be developed, the alignment determined and work taken up in phases. It is hoped that 1,000 km of expressways would be completed during the Twelfth Plan, while land for another 6,000 km would be acquired to initiate work.
7. The Plan will aim to prioritise special links for feeder roads to important railway routes and ports which are essential for development of domestic and international trade. The overall effort will be to integrate with the road development programme with the other modes of transport so as to have an integrated transport movement. Such links which connect important minor and major ports and developed with minimum two/four-lane National Highways or State Highways. Important areas of focus will be development of way-side amenities and improving capacities of implementing agencies, including State Public Works Departments. While undertaking construction of roads, modern technologies which can help in improvement of energy conservation and environmental protection will be taken up. The National Highways had added 10,000 km in the Eleventh Plan. Another 10,000 kms will be added during the Twelfth Plan so that the total length of the highways becomes 91,200 km. This will require additional resources for maintenance and improving riding quality. These will be adequately funded.

Road Development in the North-East

15.96. The development of roads in the North-East had been taken up by special programme under Special Accelerated Road Development Programme for North-East (SARDP-NE). It is proposed that the balance works under these programmes, which

includes connectivity of all State capitals of North-East with two or four-lane NHs with paved shoulders and connecting all district headquarters with two-lane NHs will be taken up for completion. SARDP-NE Phase-B for which work has been taken up to prepare DPRs would get completed. It is planned to develop and complete the Trans-Arunachal Pradesh Highway during the Plan.

15.97. The construction of roads on PPP basis has gained momentum in the Eleventh Plan and most of the roads are getting constructed on BOT (Toll) basis. It is proposed to continue with this policy in the Twelfth Plan. Simultaneously, a Model Concession Agreement (MCA) for organisation and maintenance (OMT) for tollable roads will be taken up to ensure effective maintenance. The strengthening and restructuring of the roads in the North East will be taken up for non-tollable roads. These are assets which need to be effectively maintained. To ensure this, modern management techniques and scientific assessment of maintenance strategies will be taken up. The capacities of NHAI and BRO would be further developed for this purpose.

Non-NHDP Road

15.98. The Twelfth Plan will also aim at development of roads not covered under the NHDP, which have been taken up by NHAI. It is proposed that 19,200 km of roads will be taken up for conversion of two-lane roads, including 10,000 km of NHs so declared during the Eleventh Plan. It is proposed to develop 3,770 km of roads with the help of the World Bank assistance and another 6,350 km through BOT (Toll) route. 1,000 km of expressways are planned, in addition to the NHDP programme. In addition, some of the other developments, including strengthening and improvement of riding quality, construction of bridges/ROBs will be taken up.

Roads in LWE Areas

15.99. The programme for development of roads in the Left-Wing Extremism (LWE) affected districts will be continued and works taken up earlier in the Eleventh Plan be completed during the Plan. It is expected that 4,426 km of work will get completed by March 2015 and another 9,615 km by March 2017.

New Schemes During Twelfth Plan

15.100. New Schemes during the Twelfth Plan are as under:

1. Special Package for development of roads in the Schedule Areas (under Fifth Schedule) under Tribal Sub-Plan—1,000 km for total GBS requirement of ₹5,000 crore.
2. Development of road corridors in Delhi–Mumbai industrial corridor project.
3. Special package for development of State roads in the State of J&K from strategic considerations—complete about 700 km out of total length of about 1,000 km for total GBS requirement of ₹700 crore.
4. Special package for development of road connectivity for about 50 minor ports—1,000 km for total GBS requirement of ₹5,000 crore.
5. Special package for development of road connectivity for 24 Airports—360 km for total GBS requirement of ₹1,800 crore.

Rural Roads

15.101. The Twelfth Plan will, aim to connect remaining these habitations by constructing about 1,58,000 km of new roads. 84,181 km of existing roads are planned to be upgraded during the Twelfth Plan.

15.102. In addition, the funds are required for following activities:

1. NABARD Loan (Principal) and interest repayment.
2. Provision for left-out bridges on already sanctioned roads.
3. Inclusion of left out habitations due to revision of core-network permitting to take habitations (as per guidelines) instead of revenue villages as units of connectivity in Core-Network.
4. Coverage of new habitations of 250+ in 78 IAP districts
5. Providing bridges of 75 m length in 78 IAP districts
6. Additional provisions due to snow fall/ landslides in Hill States
7. For providing connectivity to left-out habitations (as per 2001 census) in core-network and

for up gradation of some selected roads in 78 IAP districts

8. For launching of PMGSY-II during Twelfth Five Year Plan on sharing basis

15.103. During the Tenth and Eleventh Plan periods, huge investments of over ₹1,00,000 crore have been made in expanding the rural roads network. Hence, it has been proposed to launch PMGSY-II, to consolidate the existing rural road network. It would cover up gradation of existing selected rural roads based on a criterion to make the road network vibrant, on sharing basis with the States. The selection of routes would be with the objective of identification of rural growth centres and other critical rural hubs.

State Highways

15.104. A programme similar to the NHDP for the state highways is needed. The States will be encouraged to develop a core network. The development of four-lanes and two-lanes will accordingly be taken up as part of this Plan. The resources required for the State's programme of the above are estimated at ₹4.9 lakh crore, of which 20 per cent is expected to be private sector investment. For this purpose, PPP would be encouraged through Viability Gap Funding (VGF) window available with the Central Government. Targets for Twelfth Plan are mentioned in Table 15.27.

Public-Private Partnerships (PPP) and Other Initiatives

15.105. The NHDP programme will be funded primarily through PPP, a policy which had been initiated in the Eleventh Plan. For this purpose, a VGF of 40 per cent is provided in the Road Sector, including 20 per cent from the cess on petrol and diesel, which is available with the NHAI. It is proposed to continue and further strengthen the PPP construction and build BOT (Toll) roads. It is also proposed to strengthen and improve the existing framework, specifically these will be further expanded for construction of roads by the State Governments. Some of the innovations undertaken by the State Government are given in the (Box 15.9).

15.106. Roads are a major user of construction material especially of bitumen and asphalt which

TABLE 15.27
Targets for the Twelfth Plan

	State Highways		Major District Roads	
	Kilometres	% of Existing/Total Lengths	Kilometres	% of Existing/Total Lengths
2-Laning	30,000	30	20,000	8.5
4-Laning	5,000	8	1,000	4
Strengthening	41,500	25	66,500	25
IRQP	50,000	30	80,000	30

are known to emit gases into the atmosphere. Use of green bitumen materials and specific R&D schemes for possible adaptation of state-of-the-art innovative technologies and materials in highway development and maintenance would be encouraged during the Twelfth Plan.

15.107. The rapid pace of development of the road sector has resulted in skill deficit especially among the technical and engineering staff. Involvement of contractors and developers in creating skilled resource pool and encouraging Engineering and Technical Institutions to attract students in Highway Engineering profession would be some initiatives for bridging the skill gap. National Academy of Construction could be an institution worth emulation by other states.

Regulator for Roads

15.108. There is no independent regulatory authority for India's Roads and Highways sector. Current

arrangement both at Centre and States (MORTH, NHAI, MPRDC, PWDs and so on) results in a potential conflict as the rule making body is also the implementing body and there is no independent assessment of its performance across various parameters. There is, therefore, a need for a regulator whose key functions should include tariff setting, regulation of service quality, assessment of concessionaire claims, collection and dissemination of sector information, service-level benchmarks and monitoring compliance of concession agreements.

Some Major Initiatives in the Twelfth Plan

15.109. Major initiatives in the Twelfth Plan Period are:

- Earmarking of Plan funds for IRQP and strengthening/maintenance of non-tollable roads.
- Development of capacities of NHAI, BRO and other implementing agencies.

Box 15.9 **Innovations by some State Governments**

- Crucial role being played by Madhya Pradesh Road Development Corporation and Gujarat State Road Development Corporation (GSRDC) in upgrading SRs using Central Government's VGF which extends subsidy of up to 20 per cent of total project cost and an additional up to 20 per cent financed by State Government. Contribution to GSRDC is also kept to defray expenditure on pre-construction activities.
- PPP (Annuity) model adopted by Gujarat since strengthening/widening of SRs does generate a commercially viable return despite 40 per cent upfront subsidy.
- Adoption of a plan scheme for land acquisition for identified corridors by Punjab to reduce traffic congestion on major highways, with funds proposed to be released on the condition that these shall be recovered by PWD by imposing a cess on sale/purchase and any development activity carried out by the private parties on lands adjoining PWD roads.
- Creation of a Rajasthan State Road Development Fund, through a cess on sale of petrol and high speed diesel, towards extending interest free loan and share capital to the Road Infrastructure Development Company of Rajasthan for projects to upgrade SHs.

- Prioritisation of special links for feeder roads to important railway points, ports and areas where rail link is not possible.
- Special focus on development of roads for Delhi–Mumbai industrial corridor.
- States to be encouraged to develop core network for rural connectivity.
- Providing universal connectivity in rural areas under PMGSY, launch of PMGSY-II and pilots on PPP in some selected PMGSY roads.
- Focus on implementation of rural road projects in the LWE districts through the Integrated Action Plan (IAP).
- Investment in R&D, green technology and design for better and safer roads.

Road Transport

Issues

15.110. Road transport has emerged as the dominant segment in India's transportation sector with a share of 4.7 per cent in India's GDP in 2009–10 which is higher than Railways that has a 1 per cent share. Road transport has gained importance over the years despite significant barriers to inter-state freight and passenger movement compared to inland waterways, railways and air which do not face rigorous en route checks/barriers. Despite the performance of the road transport sector, it is beset with slow technological development, low energy efficiency, pollution and slow movement of freight and passenger traffic.

Eleventh Plan Review

15.111. The Road Transport policies cover efficient road movement, road safety and related areas. The approved outlay for the Eleventh Five Year Plan for the Transport Sector was ₹1,131 crore for Road Safety, National Database Network, Inspection and Maintenance Centre, Strengthening of Public Transport, Creation of National Road Safety Board.

Approach to Twelfth Plan

15.112. With the sustained high rates of economic growth, the growth of passenger and commercial traffic will be high. An estimate of this was made by working group making assumptions for various

scenarios (Table 15.28). The Plan will aim at several policy interventions to ensure efficient development of transport of passenger and freight across the country.

Development of Database in Road Sector

15.113. The availability of relevant data depends primarily on the efforts of States. Currently, the database on road transport is restricted to number of registered motor vehicles category-wise as required by the Motor Vehicle (MV) Act, 1988. There are serious gaps in Road Transport data such as decentralised generation of data, multiplicity of agencies, time lag, no data on movement of people, goods and vehicles, passenger and freight flows measured in a variety of ways and so on. These issues can be resolved by a national consensus on data generation using IT extensively. A group will be set up during the Plan to resolve the above issues and improve the national database

Efficiency of Road Transport

15.114. Measures need to be taken to improve road transport efficiency. Some of the areas which will be taken up in the Plan include: Integration of tax administration with inter-state road freight and passenger movement through online communication network system at National, Regional and Local level; Reforms in tax administration including replacing various road transport related taxes/levies (road tax, goods tax, passenger tax) and so on by a single composite tax; Reforms in Motor Vehicles Act to simplify inter-State movement with simplified procedures; Automate and Use of IT for Cross Border Road Freight Transport Management.

Electronic Tolling System

15.115. The Road Transport System needs to be modernised. For this, there is need to introduce Electronic Toll Collection (ETC) system in (Box 15.10). At present, there are very few truck terminals in cities. There is need to create a number of truck terminals in almost all 'A', 'B' and 'C' class cities and towns. These truck terminals will ease the traffic congestion in the city and decrease pollution, facilitate emergence of hub spoke system for distribution of goods and greatly improve the turnaround time

TABLE 15.28
Projected Road Freight and Passenger Traffic

Years of Twelfth Plan	Billion Tonne Kilometre (BTKM)					Billion Passenger Kilometre (BPKM)	
	S I (BAU)	S II	S III	S IV	S V	S A (BAU)	S B
2012–13	1,315	1,337	1,351	1,366	1,381	8,150	8,483
2013–14	1,429	1,465	1,489	1,513	1,538	8,868	9,111
2014–15	1,553	1,605	1,641	1,677	1,714	9,648	9,762
2015–16	1,688	1,760	1,808	1,858	1,909	10,497	10,438
2016–17	1,835	1,928	1,993	2,059	2,126	11,421	11,140

Note: BAU: Business as Usual; S-Scenario; SI-freight traffic assumed to grow at 8.7 per cent per annum in line with the past trend; SII-GDP growth 8 per cent per annum and elasticity 1.2; SIII-GDP growth 8.5 per cent per annum and elasticity 1.2; SIV-GDP growth 9 per cent per annum and elasticity 1.2; SV GDP growth 9.5 per cent per annum and elasticity 1.2; SA-passenger traffic assumed to grow at 8.8 per cent per annum; SB-BPKM derived through regression analysis as a function of population growth, urbanisation and per capita income.

Box 15.10 **Introduction of Electronic Toll Collection (ETC)**

- A Committee was set up under the Chairmanship of Shri Nandan Nilekani, Chairman, Unique Identification Authority of India.
- Recommendations of the Committee have been accepted and notified by the Ministry of Road Transport and Highways for the use of National Highways.
- In the first phase, a pilot project on ETC was inaugurated on 19 April 2012 on a section of NH-5 between Delhi and Parwanoo. Three Toll Plazas with ETC have been operationalised by the concessionaires at Panipat, DeraBassi and Parwanoo.
- A second pilot project on the Mumbai and Ahmedabad section of the National Highways has also been initiated. Progress on the project is being monitored continuously for early completion of the same.
- The other stretches of the NHs on which pilot projects have been undertaken are – Bengaluru–Chennai (State Bank of India); Kolkata–Dhanbad (IDFC Infra) and Gurgaon–Jaipur–Beawar (Feedback Infra Ltd.).
- The work of implementation of ETC on all stretches of the NHs in the country has been entrusted to NHAI. All the toll plazas across the country are proposed to be completed by January 2014.

of goods carriages. In these truck terminals there could be medical facilities, rest room, restaurant and equipment handling facilities. It is suggested that while planning SEZ or SER or Industrial Park at least 10 per cent of the area should be embarked for logistics and warehousing to support industrial activities efficiently.

Seamless Passenger Movement

15.116. There is need for promoting seamless passenger across the country. Unfortunately, there are difficulties in having inter-State agreements particularly on issue of passenger tax. There is a clear need to resolve these issues and provide the mechanism

for issues arising day to day basis. During the Plan, efforts will be made to evolve a system for a smooth interstate passenger transport movement.

Transport Safety

15.117. Transport Safety is an important area, especially for Road Transport. Annually 1.3 lakh people die in road accidents. To strengthen the data, there is need to set minimal road death and injury data reporting requirements in accordance with standards set by the International Accident Database Group (IRTAD) for national level data. Web based data systems should be established and be made operational in the Twelfth Plan period. There is need

to implement on an urgent basis the key recommendation of the Sundar Committee Report regarding the creation of National Road Safety and Traffic Management Board.

Awareness, Education and Driver Training

15.118. High level of awareness is required so that systemic problems get rectified. Awareness should be spread using all modes of communication: TV, Newspapers and Radio. ITIs need to be involved in driver training. MoRTH provides a scheme for setting up IDTR/DTI at state level. Before they start imparting driving training in driving schools, they should attend 'Trainers Training' in IDTRs/RSIs. To ensure that the needs are met, driver training schools should be encouraged to come up in the PPP mode.

Vehicle Safety

15.119. At present, the introduction of new safety standards is dependent on testing facilities available in the country including those at NATRIP. Since the vehicles produced in the next few years will be present on the road for about two decades, it is essential that the provision of testing facilities and introduction of new standards should be expedited. Impact standards for vehicles should be implemented on an early basis. Since a vast majority of those injured and killed in road accidents comprise of pedestrians, bicyclists, and motorcyclists, India should take the lead in introduction of pedestrian impact standards for all vehicles. India should set up a NCAP India Programme. In the first phase, cities with significant transport vehicles (Metros) should introduce a modern Inspection and Certification regime.

Some Major Initiatives in the Twelfth Plan

15.120. Some major initiatives during the Twelfth Plan Period are:

- Investment in R&D, technology and design of better and safer roads.
- Reforms in Motor Vehicles Act to simplify inter-State movement with simplified procedures.
- Integration of tax administration with interstate road freight and passenger movement through online communication network system at National, Regional and Local level.

- Reforms in tax administration (road tax, goods tax, passenger tax) to reduce collection cost and compliance cost of vehicle owners/operators.
- Creation of truck terminals to ease traffic congestion, decrease pollution, facilitate emergence of hub spoke system for distribution of goods and improvement in turnaround time of goods carriages.
- Creation of National Road Safety and Traffic Management Board to promote and sustain improved road safety in India, reflect international good practice and provide an informed basis for effective action.

Outlay for the Twelfth Plan

15.121. The Twelfth Plan budgetary support for Central Sector Roads is ₹1,44,769 crore. In addition, the sector is expected to generate IEBR amounting to ₹64,834 crore and private-sector investment of ₹2,14,186 crore during this period.

15.122. The Twelfth Plan budgetary support for Rural Roads (PMGSY) is ₹1,26,491 crore.

SHIPPING

15.123. There has been a consistent decline in the share of Indian ships in the carriage of India's overseas trade from 31.5 per cent in 1999–2000 to 13.7 per cent in 2004–05 and further to 7.95 per cent in 2010–11. There is a need for policy intervention to arrest this declining trend. Indian shipping fleet is characterised by the predominance of oil tankers and bulk carriers. While as on 31.03.12, oil tankers account for 63.76 per cent of the Deadweight Tonnage (DWT), bulk carriers account for 28.77 per cent, with all other vessel types such as liner vessels, OSVs and so on accounting for a mere 7.47 per cent.

Review of the Eleventh Plan

15.124. During the Eleventh Plan, three scenarios were set with first having a target of 10 million Gross Tonne (GT). It was further envisaged that with supportive policy measures, acquisition of vessels might go up to 12 million GT and 15 million GT. During the Eleventh Plan, shipping tonnage witnessed a rise from 787 vessels carrying about 8.6 million GT to 1,135 vessels amounting to 11.03 million GT. A total

of 348 vessels of 2.43 million GT were added to the fleet as against a target of 279 vessels of 4.16 million GT. The Eleventh Plan is likely to witness a growth of 6.36 per cent in DWT.

15.125. An outlay of ₹15,026 crore, including IEBR of ₹13,135 crore was provided in the Eleventh Plan for the Shipping sector. Against this, expenditure was ₹9,788.39 crore, accounting for 65.00 per cent of the total outlay. The scheme-wise details are given in Table 15.29.

15.126. Ministry of shipping has a number of organisations. This includes Director General of Shipping (DG (S)), Director General of light houses and light ships (DGLL) and Shipping Corporation of India. During the Eleventh Plan, DG Shipping which is a statutory authority under the Merchant Shipping Act, 1958 and is responsible for implementing the Act and thus perform regulatory functions, invested ₹230.68 crore for strengthening of mercantile marine department, procuring modern survey instruments for minor port survey organisations and setting up of Indian Maritime University (IMU).

15.127. The DGLL provided Marine aids to navigation along the Indian Ports and managed 180 light houses, one light ship, 22 different ships global system and 21 deep seas lighted buoys for maritime navigation. It was able to earn ₹768.02 crore and spend ₹147.98 crore (98.65 per cent) of its outlay.

15.128. The Shipping Corporation of India had planned for ₹13,135 crore (IEBR) against which ₹8,537.85 crore (65 per cent) has been spent. It

ordered 39 vessels against the acquisition targets of 67 vessels and inducted 20 vessels. The pace of vessel acquisition is slow during 2011–12, due to fall in the markets. The SCI profits decreased during the Plan from ₹813.9 crore in 2007–08 to a loss of ₹428 crore in 2011–12. Its fixed assets increased from ₹7,086.3 crore to ₹13,057.3 crore.

Strategies for the Twelfth Plan

15.129. A national shipping fleet commensurate with our overseas cargo needs would help in reducing the freight costs of Indian cargo. There is need to develop our freight policies consistent with efficiency of transport. A thriving shipping sector encourages the growth of associated industry and services providers required for servicing this industry, accounting to over 75 per cent of the shipping sector's national contribution. Most importantly, national tonnage is decisive in maintaining the supply line of essential cargo during international emergencies.

15.130. In order to enhance its reach, Director General of Lighthouses and Lightships plans to extend the facility for Coastal Surveillance and avoid environmental pollution under the National Maritime Domain scheme awareness by providing Vessel Traffic Service to Non-major Ports.

Increase in Tonnage

15.131. As on 30 June 2012, Indian tonnage stands at 11.03 million GT and ranks sixteenth in the world. During the Twelfth Plan it is planned to increase it to a target of 12.4 million GT if Indian shipping tonnage share of 1.16 per cent of global fleet remains constant in the Plan. However, with more supportive

TABLE 15.29
Financial Performance of the Shipping Sector in the Eleventh Plan

Sl. No.	Scheme/Programme	Financial Performance-Eleventh Plan		
		Approved Eleventh Plan Outlays	Approved Annual Plan Outlays	Actual Expenditure
1.	SCI	13,135.00	14,283.00	8,537.00
2.	DG (Shipping)	366.00	230.68	191.27
3.	DG (LL)	150.00	243.60	147.98
4.	IWT	615.00	693.00	537.25
	Total	15,026.00	16,108.84	9,788.39

(in ₹ crore)

policies this could increase to 26.6 Million GT or even to 53.3 MGT. These scenarios along are given in the Table 15.30 along with their required investments. An environment conducive to the growth of Indian shipping can be fostered by fiscal rationalisation, strengthening of regulatory mechanism, and increased focus on maritime training. Supportive policy measures as detailed below need to be taken to enable acquisition of vessels up to 26.6M GT.

TABLE 15.30
Estimated Requirements of Additional Vessels and Investment

	Tonnage Target	Investment (₹ in crore)
Scenario 1	11.2—12.4 m GT	2,500
Scenario 2	11.2—26.6 m GT	32,000
Scenario 3	11.2—53.3 m GT	80,000

Fiscal Regime Rationalisation

15.132. The Government had provided Indian shipping a level playing field by introducing tonnage tax in April 2004. Although tonnage tax regime provided temporary relief, some changes in direct and indirect taxation subsequently diluted these benefits. According to industry estimation, Indian shipping as against its counterparts is currently subjected to 12 types of taxes. Another aspect which translates itself into a tax-related disadvantage for the ships with Indian flags is that national manning is compulsory for them. The shipping company has to make withholding tax payments for Indian seafarers since they are not exempt from income tax. As this obligation does not devolve on ships registered in other jurisdictions employing Indian seafarers, the result is that the Indian ships have to pay a higher salary. It is critical for the growth of shipping in India that a level playing field is created as compared to other regimes in respect of taxes.

Cargo Support

15.133. The continuation of the policy with respect to Government owned and controlled cargo to be imported on FOB basis and shipping arrangements to be channelised through the Ministry of Shipping's Chartering Wing, Trans-chart would be advisable. Measures to promote use of Indian Flag Ships can

significantly boost the growth of Indian shipping fleet during the Twelfth Plan. It has been suggested that a portion of the EXIM trade say, one-third of the POL and dry bulk cargo can be reserved for Indian Flag Ships as a condition for availing benefits from the government for export schemes. This would enhance cargo availability for Indian ships, and be a major catalyst to boost the growth of Indian fleet. This suggestion would need to be examined and an incentive policy to promote Indian Flag Ships should be developed.

Maritime Human Resource Development and Training

15.134. India has positioned herself as a major human resources-supplying nation to the maritime industry. As a result of the initiatives taken by the government in encouraging private participation in maritime training, the number of maritime training institutes under the assurance of quality training by the Directorate General of Shipping DG(S) rose from 128 in 2005 to 138 in 2012 including seven Government institutes.

15.135. Global demand for seafarers is estimated to reach 6,70,000 Officers and 7,20,000 Ratings by 2015. This will imply an incremental demand of 1,20,000 Officers and 1,25,000 Ratings. Seafarer supplying countries (for example China, Philippines, Turkey and Ukraine) are expected to compete for capturing this incremental demand to increase their global share. Shortage of officers is expected to aggravate due to high fleet growth. India has an opportunity to supply more officers in the international maritime sector.

15.136. The target for the maritime training programme for the Twelfth Plan is to increase the share of Indian officers from 6.3 per cent to about 9 per cent by 2017, whereas for ratings from 7.5 per cent to about 9 per cent by 2017. Policy initiatives are required to retain and build talent. Initiatives for this could include the co-option of the member lines of the INSA into allocating 10–15 per cent of each ship's manning scales exclusively for sea training berths.

15.137. With the objective of providing world class training opportunity for the shipping sector, the

Government has established an Indian Maritime University (IMU) in Chennai with campuses in Kolkata, Mumbai, Visakhapatnam, Kochi, Chennai and Kandla. The IMU aims to play the role of a centralised nodal agency to facilitate Maritime studies and research in emerging areas such as marine science and technology and marine environment. The Indian Maritime University should play the role of a centralised university in controlling higher maritime education through academic support processes in its campuses throughout India.

15.138. There is a need to strengthen the IMU through induction of high quality faculty. The important role presently being played by the Regional Academic Councils under the Directorate General of Shipping should be further strengthened by reconstituting them to form an Advisory Group.

15.139. There should be a strong emphasis on the need for improving quality of Indian seafarers to keep up the reputation and credibility of Indian certifications. For this, not only the number of training institutes but the quality of such training, examination and certification of seafarers is to be emphasised. To achieve this, there is an urgent need of modernising the examination system and strengthening the pool of qualified examiners.

15.140. It is proposed to form a Research Support Group to effectively monitor, support and coordinate the activities of Maritime Training Institutes and to develop proper monitoring and reporting systems and conduct systems audit on a continuous and sustainable basis. The Research Support Group would identify the difficulties experienced by institutes in implementing the quality standards prescribed by Indian Maritime Administration and IMU and would serve as a watch dog. The Support Group will work under the control of the Director General of Shipping and assisted by technical administrative officers/Staff meant specifically for this function.

15.141. For effective implementation of a regulatory regime as per the requirements of International Maritime Organisation (IMO), it is necessary to

strengthen Directorate General of Shipping. A data base of seafarers should be built. Biometric identity cum smart card, capable of storing individual's professional record in electronic form must be issued to every seafarer. There is also a need for capacity building of the DG(S), with greater technological tools, training, human resources availability and greater autonomy for authorising surveyor movement to Indian ships on foreign shores, and in deciding the delegation of powers to Mercantile Marine Departments. Every port regardless whether it is private or non-major, but having target of more than 110 ships a year, (which works out to two ships a week) should have an office of MMO.

15.142. In order to prevent poor quality foreign flag ships operating in our waters, Port State Control inspections have to be strengthened in the years ahead. The main constraint in the implementation is the availability of manpower. It is therefore proposed to create separate divisions in the DG (Shipping office) and to recruit more surveyors to achieve 10 per cent Port Security Control (PSC) inspections by the year 2015 as mandated by the IMO. It is also proposed to carry out 100 per cent FSI inspections of Indian ships by the year 2020.

15.143. Very often a seafarer's job is perceived to be arduous, monotonous, risky and unsafe. This calls for critical welfare and safety measures. Welfare measures for seafarers should include a free or subsidized health and insurance policy.

15.144. Indian ships have to mandatorily employ Indian seafarers, and cannot employ foreign seafarers as per the Merchant Shipping Act. In view of the increasing worldwide shortages of senior officers, there is inherent disadvantage to the Indian ship owner as employers. On account of the extra burden of income tax on Indian seafarers' income, employment on a foreign flag is the first choice of an Indian seafarer, thereby denying the best talent to the local shipping industry. A positive approach on this issue for granting freedom for the Indian shipping industry by permitting them to employ foreign seafarers could be explored.

Other Policy Initiatives

Establishing P&I Club

15.145. In present day scenario, maritime insurance of ships, wreck removal, dealing with maritime both for the ship and seafarers are organised by P&I Clubs of foreign origin. Establishing P&I Club in India should not only increase trade but would also augment foreign exchange earnings when these clubs are used by foreign companies. It is therefore proposed to establish one P&I Club in Indian League by the year 2015 and one more in the IG League by the year 2020.

Strengthening Participation in IMO

15.146. The increasing number of International Codes and Conventions, emanating from the International Maritime Organisation (IMO), have changed the maritime trade relationships between nations and also created a whole new statutory structure for maritime countries.

Navigational Safety In Port Committee (NSPC)

15.147. The scope of NSPC may be extended to major as well as non-major ports and the duties should include port navigational safety issues, cargo related safety aspects, oversight function of oil pollution response mechanism, reception facilities in the ports, and so on. For the protection of the environment, it may be necessary to develop a 'Ballast Water Management System' in accordance with the requirements of International Convention for the Control and Management of Ships as adopted by the IMO in 2004, along with the development of waste disposal facilities in ports.

Coastal Shipping

15.148. Out of the total traffic at major ports of 560.90 million tons (MT) in 2009–10, coastal traffic was 107.94 MT. During 2006–10, the total traffic at the major ports grew at 7.20 per cent (CAGR) and that at the non-major ports at 17.20 per cent (CAGR). However, during 2006–10, coastal traffic at the major ports grew at 4.5 per cent (CAGR) and the percentage share of coastal traffic in the total traffic handled at the major ports was constant between 19 per cent to 21 per cent. During Eleventh Plan period there was a

net increase of about 15 per cent in the total volume of cargo carried per year meant for coastal shipping. Coastal shipping in the country is still in its infancy, with the coastal fleet of 764 vessels accounting for merely over a million GT as on 31 March 2012. This period witnessed a remarkable growth in the number of smaller size vessels (Liner, Passenger-cum-Cargo and other types viz., Tugs, Ro-Ros, Dredgers and Pilot/Survey Launches), with the number of coastal bulk carriers and tanker fleets declining.

15.149. In view of the positive externalities of coastal shipping, a number of policy interventions would be required during the Plan. There is a need to consider fiscal incentives for registered multi-modal transport operators, shippers, trade/industries that prefer transporting sizeable domestic cargoes through coastal shipping. Unfortunately, despite having the lowest unit transportation cost for the sea leg, the overall end-to-end cost of coastal shipping escalates due to inadequate port and land side infrastructure (capacity and connectivity), resulting in a preference for the road/rail modes by the industry and trade. The burden of customs duties and the perceived cumbersome customs/other procedures, low port productivity and high tariffs, aggravates the problem. There is a need to remove these bottlenecks.

15.150. Adequate incentives and a level playing field are required to encourage the growth of the Indian coastal shipping companies in the face of stiff competition from the foreign lines. The scope of coastal shipping needs to be enhanced in the Indian Merchant Shipping Act, 1958. There is a need to create dry-docks and ship repair yards at existing/new non-major ports to accommodate smaller coastal vessels. The connectivity for the ports with rail/road transport needs to be enhanced. Further, the government may also consider following incentives for the development of Coastal Shipping: (i) Grant infrastructure status to Coastal Shipping Industry for taxation purposes (ii) Allow tax exemption for the building of coastal ships in India (iii) Confer 'Declared Goods' status for the bunker used by coastal ships (iv) Establish a 'Coastal Development Fund'. A separate tariff matrix should be formulated for coastal vessels.

15.151. To reduce greenhouse gases (GHGs) emissions, the conversion of Indian coastal vessels to compressed natural gas (CNG) fuel powered, as an alternate to the extant fossil fuel diesel, in a phased manner, is necessary.

Promoting Fishing Activity In Indian Seas

15.152. There is a need to promote decent working conditions for fishermen. The provisions of the International Labour Organisation Fishing Convention, 2007 may be implemented for the Indian fishing boats above 15 meters in length. The number of such Indian fishing vessels is approximately 55,000. These improvements would contribute to the decent working conditions of the fishermen working on these boats.

Multimodal Transportation

15.153. Multimodal transportation system is the chain that interconnects different links or modes of transport air, sea, and land into one complete process that ensures an efficient and cost-effective door-to-door movement of goods under the responsibility of a single transport operator, known as a Multimodal Transport Operator (MTO), on one transport document. The multi-modal transportation in India is governed by the Multimodal Transportation of Goods Act 1993 which needs to be strengthened to address issues such as liability regime, setting of service standards and registration of service providers, to provide transparency in operations. In view of the overall efficiencies associated with this system, Government would develop policy interventions encouraging companies to use this.

Strategies for the Twelfth Plan

- Increase in tonnage to meet the growing requirements of the Indian Trade and Commerce.
- Fiscal regime rationalisation and cargo support to expand Indian flag vessels.
- Maritime Human Resource Development for larger utilisation of Indian technical personnel in national and international shipping.
- Expansion of Coastal shipping and policies to promote infrastructure and economic operations.
- Development of strategies for expansion of multimodal transport.

INLAND WATERWAYS TRANSPORT (IWT)

Introduction

15.154. With a meager share of 0.4 per cent in the total cargo handled in the country Inland Waterways is an under developed mode of transportation in India. India has a potential of 14,500 km of navigable waterways but so far only 2,716 km have been developed for commercial transportation. The share of IWT in transport sector in other countries is far more significant than that of India. For example, the shares of IWT as proportion of total tonne-km in EU, China and the US for the year 2006 were 5.6 per cent, 8.7 per cent and 8.3 per cent respectively.

15.155. The potential for development of this mode of transportation is very promising. IWT mode is best-suited for movement of bulk cargo, over dimensional cargo and hazardous goods. IWT also offers an environment-friendly economic mode of transport compared to road and rail. According to recent studies, the total external costs of inland navigation after accounting for all externalities, including accidents, congestion, noise emissions, air pollution and other environmental impacts are seven times lower than that of road transport.

15.156. On Ganga (NW-1) alone there are 10 thermal power plants and at least 10 more are slated to come up in near future (See Figure 15.1). The transportation of coal to these power plants is considered to be one of the most challenging tasks. IWT can be effectively used for this purpose, particularly for the imported coal since most of these plants would be importing 10–20 per cent of their coal which can be transported through NW-1.

Review of the Eleventh Plan

15.157. At present the traffic of IWT is only 5 billion tonne km (btkm). The target for Eleventh Plan has been largely achieved, not so much by utilising NW1, 2 and 3 but by increased IWT movement of iron ore in Goa waterways. In the Eleventh Plan IWAI reached expenditure level of about ₹560 crore during the five years (2007–12) with an average of ₹112 crore.

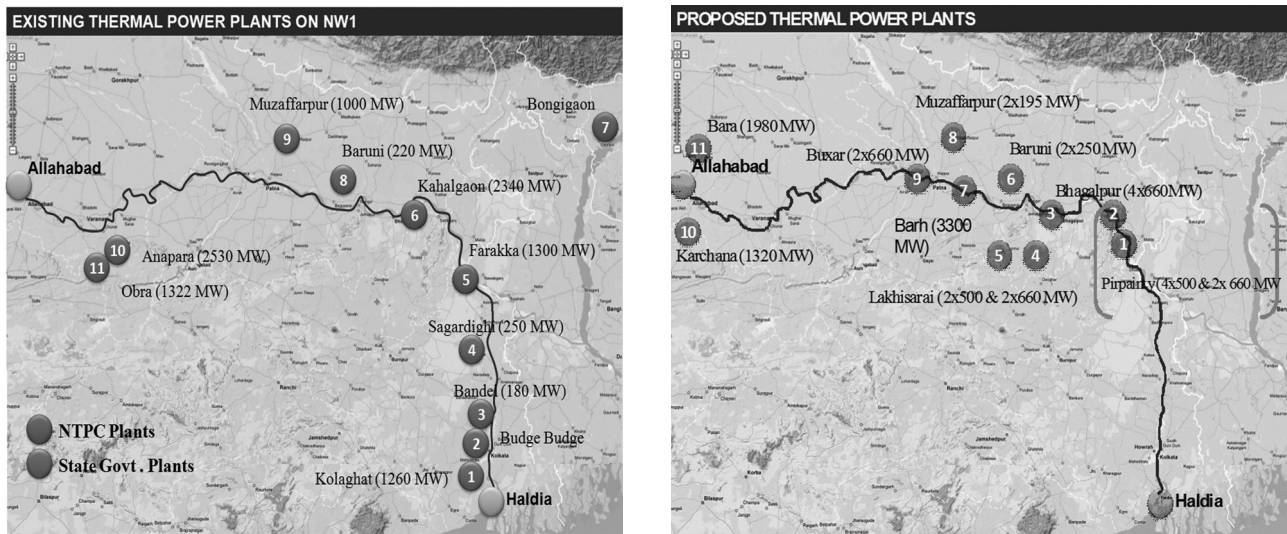


FIGURE 15.1: Existing and Proposed Thermal Power Plants on National Waterways

15.158. The main developments during the Eleventh Plan were:

1. Two additional waterways were declared as National Waterways in November 2008. These were NW-4 and NW-5. As a result of this, the following waterways totaling 43,82 km have been declared as National Water Ways (NWWs):
 - a. Ganga–Bhagirathi–Hoogly river system (Allahabad Haldia-1,620 km) in the States of Uttar Pradesh, Bihar, Jharkhand and West Bengal as NW-1, declared in 1986.
 - b. River Brahmaputra (Dhubri–Sadiya—891 km) in the State of Assam as NW-2 declared in 1988.
 - c. West Coast Canal (Kottapuram–Kollam) along with Udyogmandal and Champakara Canals—(205 km) in the State of Kerala as NW-3 declared in 1993.
 - d. Kakinada–Puducherry canals along with Godavari and Krishna rivers (1,078 km)—in the States of Andhra Pradesh, Tamil Nadu and Union Territory of Puducherry as NW-4 declared in 2008.
 - e. East Coast Canal integrated with Brahmani river and Mahanadi delta rivers (588 km) in the states of West Bengal and Odisha as NW-5 declared in 2008.
2. A major project has been finalised involving a private agency for developing infrastructure and transportation of 3 million tonnes per year of imported coal from Sagar/Sandheads to Farakka power plant of NTPC Ltd. through NW-1 for a period of 7 years. A number of Over Dimensional Cargoes (ODCs) have also been transported on NW-1 from Haldia/Kolkata to Barauni, Barh, Ballia, Jamania, and so on for Barauni refinery, NTPC, BHEL, Power Grid Corporation, Reliance (Sasan), Tori power plant, Reghunathpur power project and so on. ODC also moved from Kolkata to Jogighopa on NW-2 and to Silchar on Barak river. This became possible due to enhanced level of infrastructure on waterways in respect of depth, navigation aids and intermodal terminals.
3. Pandu port in Guwahati is being developed as an IWT based inter modal hub in the North East region with broad gauge railway connectivity.
4. Besides 8 terminals at various locations on NW-3, IWT Ro-Ro/Lo-Lo jetties at Bolghatty and Willingdon islands in Kochi on NW-3 are to provide IWT linkage to Vallarpadam Port.

Transportation of Project Cargo for Palatana Power Project in Tripura

15.159. Another important development in IWT has been Palatana project. The commissioning of a gas

based power project of ONGC at Palatana in Tripura was getting delayed due to serious problems in transporting project material from Kolkata/Haldia to the site by road and railways. However, declaration of Ashuganj in Bangladesh as a port of call under Indo Bangladesh Inland Water Transit and Trade Protocol during the year 2010 opened a new route. With this route having become operational the new possibilities of transporting other cargo including food grains to Tripura and Mizoram by IWT mode have emerged.

Strategic Importance of IWT For North East: Brahmaputra-Barak Route

15.160. Only in case of IWT there is transit treaty between India and Bangladesh. All weather IWT route therefore has strategic significance in the North East as it helps to avoid the congested West Bengal–Sikkim narrow corridor. Several North Eastern States can be reached through IWT routes (Brahmaputra and Barak). Distance to Tripura, Mizoram and Southern Assam is also much less through IWT (Figure 15.2).

Kaladan Multimodal Transport Project

15.161. This project was conceptualised by the Ministry of External Affairs to provide alternative

connectivity from Mizoram to Haldia/Kolkata ports through River Kaladan in Myanmar. The project envisages Coastal Shipping/Maritime Shipping from Haldia to Sittwe, IWT from Sittwe to Paletwa (in Myanmar) and thereafter by road from Paletwa to Mizoram. An Indian contractor has been appointed for construction of port and IWT components at a cost ₹342 crore with a completion period of 3 years. The construction work of Sittwe port has commenced and is in progress (Figure 15.3).

Strategies for the Twelfth Plan

Navigation-Based Infrastructure

15.162. Large parts of Indian Waterways have inadequate Least Assured Depth (LAD) for commercial movement of cargo. Many shippers have expressed that there is no dearth of cargo if the waterway with assured depth and 24 hours navigation facility is provided and there is an adequate number of cargo vessels.

1. Efforts should be made to develop deeper stretches of the rivers for IWT/navigational purposes (at least 2.5 m, preferably 3.0 m. LAD for round the year navigation).
2. Several rivers in India meander resulting in increase in distance to be travelled on waterways as compared to road and rail. Technical feasibility of reducing the IWT route length by strengthening the waterway (wherever feasible) to avoid bends could be studied.
3. There are bridges with low vertical clearance which impede passage of bigger IWT vessels on the waterways such as NW-3. Raising these bridges to at least 5 m or some other technical solution to make these canal systems navigable for commercial cargo carriers could be considered. Alternatively vessels with lower masts can be used to negotiate the already constructed major bridges.
4. Lack of IWT terminals including those with intermodal connectivity of inland waterways inhibits door to door connectivity to end user. There are IWT terminals on NW-1, NW-2 and NW-3 but many of these terminals require better linkage with road/rail. IWT terminals must have

Box 15.11

Coal Transport to Farakka through Power Station – A Break through for IWT

NTPC's power plant at Farakka had been facing shortage of coal mainly on account of limitation in transportation capacity of railways and low draft at Haldia dock. Since, the power plant having been located on the bank of Ganga (the National Waterway-1), it was felt that transportation of imported coal from Haldia/Sagar/Sandheads to Farakka by inland water transport (IWT) mode would be feasible. In August 2010, NTPC decided for transportation of 3 million tonnes per year (MMTPA) imported coal for seven years. IWAI and NTPC then developed a project envisaging an investment of about ₹650 crore for setting up (i) trans-shipment facility at Sagar/Sandheads (ii) barges for 3 MMTPA coal transportation (iii) inland water terminal at Farakka and (iv) conveyor system from the terminal to the coal stack yard of Farakka power plant. IWAI has now guaranteed Least Available Depth (LAD) of 2.5 m to Farakka along with other navigational aids for safe 24×7 navigation. A private company is developing facilities and will maintain these for seven years.

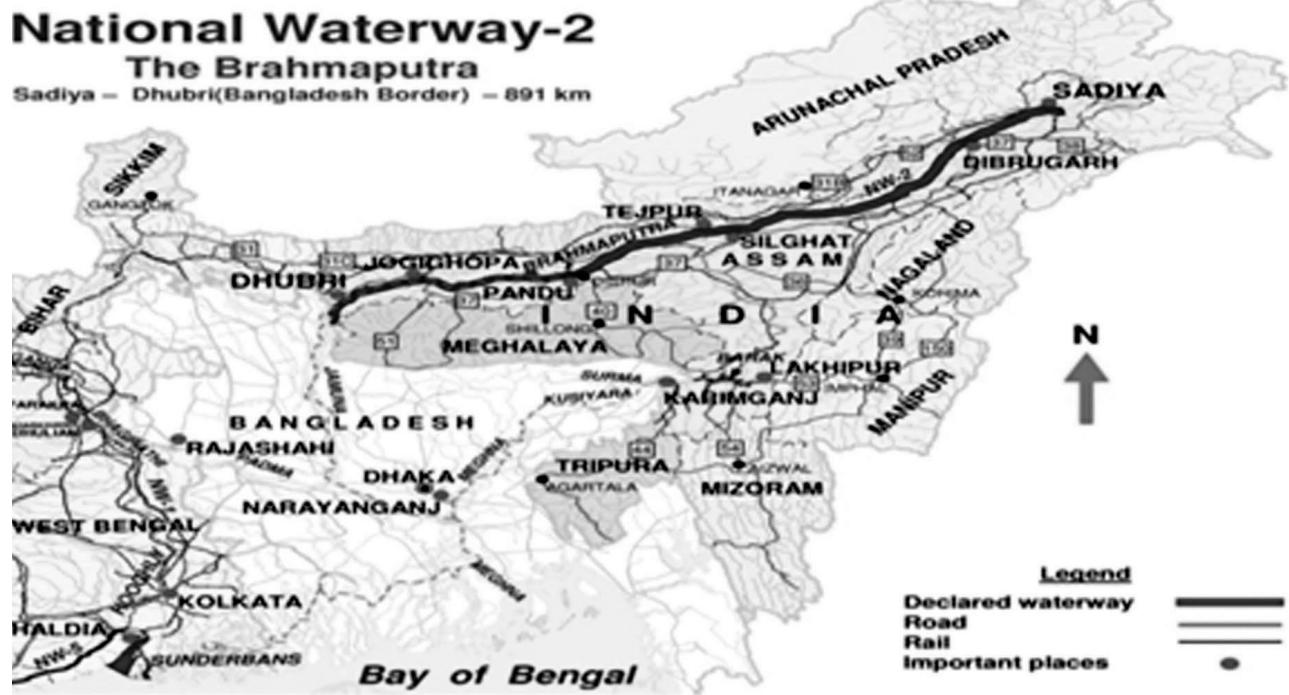


FIGURE 15.2: National Waterway-2

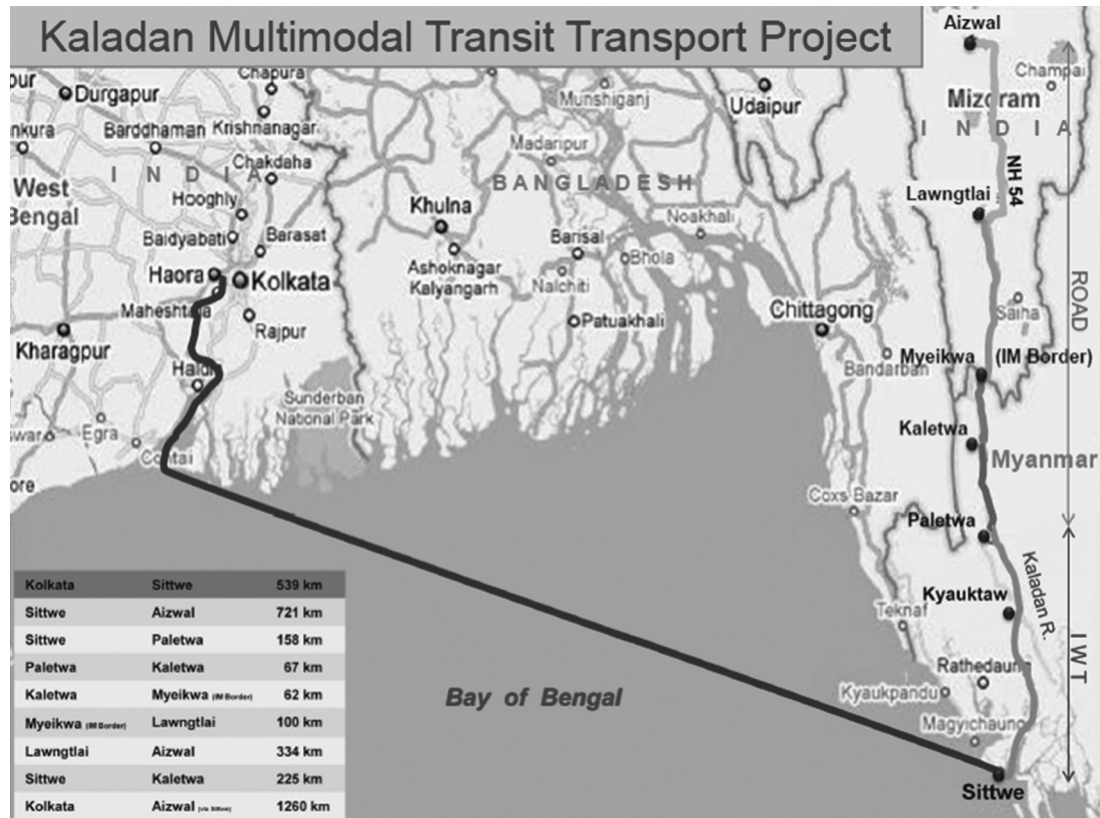


FIGURE 15.3: Kaladan Multimodal Transit Transport Project

good connectivity with road and preferably with rail for last mile connectivity on lines of bimodal and tri-modal concept of developed waterways of other countries. Similar terminal development is required in NW-4, 5 and proposed NW- 6.

5. Private sector is reluctant to make investment in barges unless long term cargo commitments for onward/return trips are made available from user industry. Eligibility of IWT Vessel building “Infrastructure Status” could be considered to help obtain easier credit availability.
6. Developing night navigation infrastructure with DGPS and RIS in a time bound manner could help 24 hour navigability.
7. MRO (Maintenance, Repair and Overhaul) facilities which are presently in short supply could also catalyse the sector.

15.163. Shortage of vessels is perceived to be the most important factor inhibiting faster growth in IWT cargo movement. The fleet requirement for 15 btkm of IWT traffic is about 2,500 vessels of average 1,000 tonne capacity each. At present, there are just about 600 IWT vessels in the entire country with nearly 80 per cent vessels being located in Goa alone. This would call for an investment of ₹13,000 crore. There is need to incentivise these investments and develop a policy framework so that private sector investments are attracted to vessel building.

Level Playing Field

15.164. There is a transport subsidy for movement of raw materials and finished goods for the new industries of NER but this is applicable only for rail and road modes and not to IWT. Similarly, the transport subsidy available for movement of fertilisers is also meant for rail and road modes. The service tax applicable to IWT is more than rail and roads. There is need for a level playing field and removal of distortions resulting from such policies.

15.165. Development of inland waterways is an eligible sector for Viability Gap Funding and India Infrastructure Project Development Fund. The usage of the IWT network for ‘water tourism’ theme has

potential to generate considerable income for the local economies and additional income from tourist/luxury taxes for regional and state governments. For example, in Kerala, over 2,000 people are employed in houseboats and other motorboats that cruise the inland waterways filled with tourists. Expanding the usage of IWT for tourism can be included as one of the objectives to improve waterways for economic development.

Human Resource Development

15.166. To meet trained manpower requirements of the sector, it is necessary that National Inland Navigation Institute (NINI) is strengthened and networked with Indian Maritime University and at the same time, a few Regional Crew Training Centres are also set up. The training should be benchmarked to the best available standards.

Strengthening of IWT Institutional Set Up in Riverine States

15.167. In every IWT developed region the importance of trunk waterways gets significantly enhanced with development of feeder waterways which are smaller in length but provide vital ‘last mile connectivity’. In India too, every big waterway has a number of tributaries which if developed can effectively serve as feeder routes to the main waterways. But these waterways will have to be developed by respective State Governments which do not have the organisation, the expertise and the resources to even consider this aspect in their planning. Hence IWT institutions set up in the States need to be strengthened in a big way including for checking the safety of vessels to prevent accidents.

Target for the Twelfth Plan

15.168. At present the share of IWT in terms of tonne-km is about 5 btkm which is less than 0.5 per cent of total inland cargo transportation. Given the distinct advantages of promoting IWT, Twelfth Plan target to at least triple the tonne-km to 15 btkm and increase the share of IWT in transport to 1–1.5 per cent of total inland cargo transportation from the current level of less than 0.5 per cent.

Strategy For Development of Inland Water Transport

- Increased public and private investments in infrastructure of notified Inland Waterways.
- New policies to promote manufacture of Inland Waterways Vessels for cargo movement by private sector.
- Development of National Waterway 4 and 5.
- Development of night infrastructure facilities to help 24 hours navigation.
- Promoting connectivity with Bangladesh and strengthening IWT infrastructure.
- Hinterland connectivity through IWT with ports, both major and non-major having this facility.

PORTS

15.169. Ports constitute inter-modal interface between maritime and road and rail transport. India has a coast line of around 7,517 km with 12 major ports and over 200 non-major ports along the coast line and sea islands. Almost 95 per cent by volume and 70 per cent by value of India's global merchandise trade is carried through the sea route. In 2011–12 the 12 major ports handled about 60 per cent of the maritime cargo of the country. The balance 40 per cent was handled by the non-major ports. Of the 12 major ports, 11 are administered by the respective Port Trusts and Ennore Port, the twelfth major port, which started functioning in February 2001, is corporatised.

Review of the Eleventh Plan

Capacity Creation in the Eleventh Plan

15.170. The projected capacity creation was 1,001.80 million tonnes for the major port sector but the achievement was 689.83 MT (Table 15.31) as compared to 504.75 MT in 2006–07 registering a growth of 37 per cent but below the target by 31 per cent. Cargo-wise capacity creation details for major ports are shown in Table 15.32. Capacity of non-major and Private Ports was envisaged to increase from 228.31 MT to 575 MT. The actual achievement was 544.65 MT, thus registering a growth of 139 per cent.

Traffic Handled by Major and Non-Major Ports

15.171. During the Eleventh Plan, traffic handled by major ports (Table 15.31) increased from 463.78 MT

in the year 2006–07 to 560.15 MT in the year 2011–12 against a projection of 708.09 MT, thus registering a growth of 29.48 but 26.55 per cent lower than the projection. However, non-major ports registered a cargo growth of 98.81 per cent during the same period, that is, from 186.11 MT in the year 2006–07 to 370.00 MT in the year 2011–12 which is 23.26 per cent higher than the projection of 300.86 MT. Commodity wise details are shown in Table 15.33.

Productivity in Major Ports

15.172. The average turnaround time and average pre-berthing time at major ports have worsened during the Eleventh Plan (Table 15.34). There is an improvement of average output per ship berth day from 9,745 MT in year 2006–07 to 10,967 MT in year 2011–12. Ports-wise performance shows that the average turnaround time declined mainly due to good performance by Paradip, Mormugao, Chennai and Kolkata ports. Commodity-wise it declined for other liquid bulk, Iron Ore, FRM and Coal. It is estimated that 57 per cent of turnaround time of ships at Indian Ports is caused by delays due to port related inefficiency. The Pre-berthing detention during the Eleventh Plan period has shown an increasing trend. Among the ports, healthy improvement has been observed in Visakhapatnam, Ennore, New Mangalore and Mormugao ports, whereas in other ports the improvement has not been significant primarily due to non-availability of berths meant for the cargoes like Iron Ore, Coal and Other Miscellaneous and General Cargo continuously for a long period.

Private Sector Participation

15.173. During the Eleventh Plan, award of PPP projects commenced only in the year 2009–10 as first two years of the Plan were spent in finalising MCA documents. There were, however, projects awarded to private players based on earlier contracts. Upto 2011–12, 30 PPPs involving an investment of 9,447.40 crore and capacity addition of 204.65 MT were completed. During Eleventh Plan, PPP projects with capacity addition of 154.5 MT were awarded with an investment of ₹13,195.85 crore. The details of year wise awards during the Eleventh Plan are given in Table 15.35.

TABLE 15.31
Eleventh Plan Projection and Achievements of Traffic and Capacity by Major Ports

Port	Traffic in Eleventh Plan (MT)			Total Capacity in Eleventh Plan (MT)		
	(2011-12)			(2011-12)		
	Project	Achievement	per cent	Project	Achievement	per cent
Kolkata	13.43	12.23	91	31.45	16.35	51
Haldia	44.50	31.01	70	63.40	50.70	79
Paradeep	76.40	54.25	71	106.4	76.50	71
Visakhapatnam	82.20	67.42	82	108.1	72.93	67
Ennore	47.00	14.96	32	64.20	31.00	48
Chennai	57.50	55.71	97	72.30	79.72	110
Tuticorin	31.72	28.10	89	63.98	33.34	52
Cochin	38.17	20.10	53	54.75	40.98	74
NMPT	48.81	32.94	68	60.50	50.97	84
Mormugao	44.55	39.00	88	66.90	41.90	62
Mumbai	71.05	56.18	79	91.91	44.53	48
JNPT	66.04	65.75	100	95.60	64.00	66
Kandla	86.72	82.50	95	122.20	86.91	71
Total	708.09	560.15	79	1,001.80	689.83	69

TABLE 15.32
Commodity Wise Capacity Creation by Major Ports during Eleventh Plan

(Million Metric Tonnes)				
Sl. No.	Capacity	2006-07	2011-12	Increase (per cent)
1.	POL	174.70	228.76	30.94
2.	Iron Ore	57.50	79.50	38.26
3.	Coal	46.25	65.95	42.59
4.	Container	88.08	137.53	56.14
5.	Other Cargo	138.22	178.09	28.84
6.	Total	504.75	689.83	36.67

Dredging

15.174. The requirement of capital dredging in the Eleventh Plan was envisaged to increase more than two-fold, to 298.28 million cubic meters (MCuM) for major ports and 368.59MCuM for non-major ports, besides maintenance dredging of 380.06 MCuM and 46.41MCuM, respectively. To enable this, a more liberal dredging policy was brought into force which allows ports to charter foreign flag dredgers after granting the Indian companies

the 'first right of refusal'. Against the targeted Plan, only 40.02 per cent and 67.92 per cent have been achieved under the capital and maintenance dredging respectively.

15.175. The capacity of the DCI, established in 1976, to provide integrated dredging services to major and minor ports was 73.60 MCuM of Trailer Suction Dredgers (TSDs) and 6.25 MCuM of Cutter Suction Dredgers (CSDs) at the start of the Tenth Plan. During the Eleventh Plan, DCI was envisaged to acquire 10 TSDs of 5,000-9,000 CuM hopper capacity and 5 CSDs of 2,000-3,000 CuM hopper capacity in addition to other auxiliary equipment. However, against outlay of ₹2,292 crore, DCI's anticipated expenditure by the end of Eleventh Plan is only ₹828.35 crore.

Port Connectivity

15.176. The Eleventh Plan envisaged that each major port should have at least four-lane road and double lane rail connectivity. At present, 13 road projects with combined road length of 360 km at a total cost of ₹4,149.66 crore and rail projects at a cost of ₹3,903.00 crore are under implementation.

TABLE 15.33
Traffic Handled at Major and Non-Major Ports during Eleventh Plan

Traffic	Major Ports			Non-Major Ports			Major and Non-Major Ports		
	2006-07	2011-12	% increase	2006-07	2011-12	% Increase	2006-07	2011-12	% Increase
POL	154.34	179.28	16.16	80.37	188.00	133.92	234.71	367.28	56.48
Iron Ore	80.59	60.60	(-)24.80	34.33	51.00	48.56	114.92	111.60	(-)2.89
Fert. and FRM*	14.12	20.42	44.62	4.67	11.00	135.55	18.79	31.42	67.22
Coal	59.98	78.74	31.28	12.92	77.00	495.98	72.90	155.74	113.64
Container	73.44	120.22	63.70	7.87	19.00	141.42	81.31	139.22	71.22
Other Cargo	81.31	100.89	24.08	45.95	24.00	(-)47.77	127.26	124.89	(-)1.86
Total	463.78	560.15	20.78	186.11	370	98.81	649.89	930.15	43.12

* Fertiliser and Fertiliser Raw Material (FRM).

TABLE 15.34
Trend of the Productivity Parameters during Eleventh Plan

Year	Average Output Per Ship Berth Day (Tonnes)	Average Turnaround Time (Days)	Average Pre-berthing Detention Time (Hours)
2006-07	9,745	3.62	10.05
2007-08	10,071	3.93	11.40
2008-09	10,473	3.87	9.55
2009-10	10,482	4.42	11.75
2010-11	10,735	4.67	11.76
2011-12	10,967	4.44	11.14

TABLE 15.35
Year-wise Awards during Eleventh Plan under PPP

Years	Investment/Awards (₹ in crore)	Capacity Addition (in MMT)
2007-08	703.34	7.50
2008-09	749.43	18.00
2009-10	618.95	19.50
2010-11	3,147.13	30.50
2011-12	7,977.00	79.00
Total	13,195.85	154.50

respectively with the corresponding ports capacities of 1,229.24 million tonnes and 1,059.80 million tonnes respectively.

Eleventh Plan Outlay and Expenditure

15.177. An outlay of ₹30,323.11 crore (at 2006-07 prices) had been approved for the port sector, comprising ₹3,315.00 crore as GBS and ₹26,574.11 crore through IEBR of which ₹17,684.61 crore or 59.62 per cent is expected to be utilised. In addition, private sector investment of ₹36,868.00 crore and a public investment of ₹3,627.00 crores is expected in the state sector.

Twelfth Plan

Traffic and Capacity Augmentation

15.178. To meet the overall projected traffic of 1,758.26 million tonnes by 2016-17, the total capacity of the port sector is envisaged to be 2,289.04 million tonnes. The traffic forecast by the end of Twelfth Plan would be 943.06 million tonnes and 815.20 million tonnes for the major ports and non-major ports

15.179. The details of the traffic/capacity projections (port wise and commodity wise as well as major and non-major ports wise) by the end of Twelfth Plan are given in Tables 15.36, 15.37 and 15.38 respectively.

Issues and Strategies for the Twelfth Plan

Committee on Ports

15.180. The Plan will need to ensure adequate investments in the Port Sector to meet the growing capacity needs of our international and coastal trade, improve efficiency by reducing dwell time and turnaround time and introduce legislative and institutional reforms to support these. The Committee on Ports headed by Shri B.K. Chaturvedi, Member (Transport), Planning Commission has suggested a series of reforms to attain the above objectives and

these will need to be taken up. To support capacity expansion in port sector, necessary measures for efficient environment clearance and land acquisition will be taken up. An area, which will need special attention, is security clearance. The policy on this needs to be revised and made efficient.

Tariff Regulation

15.181. With the key objective of determining tariffs for the major ports and also specify the conditionality governing these tariffs, TAMP was established in 1997 by an amendment in the Major Port Trust's Act, 1963. With the increase in port capacities, it is necessary that in the next five years, the ports move gradually to a competitive mode of tariff. Already all non-Major Ports are doing so. A task force under the Chairmanship of Shri B.K. Chaturvedi to review the draft Port Regulatory Bill was formed which has finalised its report which will be of use to review the policy in this area.

Electronic Data Interchange

15.182. Efficient electronic data interchange is required to improve the efficiency of Ports. It is necessary for Port Community System (PCS) to integrate the electronic flow of document/information and function as centralised hub for all the major Ports of India and also stakeholders like shipping lines/agents, surveyors, stevedores, banks, container freight stations, custom house agents, importers and customs. Further, non-major ports should also gradually integrate with the centralised port community.

TABLE 15.36
Major Ports wise Traffic/Capacity Projections by End of Twelfth Plan

Port	(Million Tonnes)			
	Traffic		Capacity	
	Existing (2011-12)	Forecast (2016-17)	Existing (2011-12)	Forecast (2016-17)
Kolkata	12.23	22.87	16.35	32.85
Haldia Dock Complex	31.01	53.20	50.70	71.10
Paradip	54.25	87.70	70.50	125.50
Visakhapatnam	67.42	80.00	72.93	130.23
Ennore	14.96	82.45	31.00	78.00
Chennai	55.71	69.74	79.72	114.72
V.O. Chidambaranar	28.01	48.84	33.34	81.54
Cochin	20.10	45.50	40.98	57.83
New Mangalore	32.94	53.50	50.97	84.89
Mormugao	39.00	58.25	41.90	72.71
Mumbai	56.18	67.40	44.53	79.13
JNPT	65.75	140.21	64.00	155.61
Kandla	82.50	130.90	86.91	145.13
Port Blair		2.50		
Total	560.15	943.06	689.93	1,229.24

Dredging

15.183. Drafts at Indian Ports both in the channel and at berths need to be improved. It should be a major objective of the Twelfth Plan that ports in India

TABLE 15.37
Commodity wise Capacity by the end of Twelfth Plan

Commodity	(Million Tonnes)					
	Major ports		Non-major ports		Total	
	Existing (2011-12)	Forecast (2016-17)	Existing (2011-12)	Forecast (2016-17)	Existing (2011-12)	Forecast (2016-17)
POL (incl. LNG)	228.76	299.66	276.74	299.90	505.50	599.56
Iron Ore	79.50	143.55	75.07	101.40	154.57	244.95
Coal	65.95	178.65	113.35	365.20	179.30	543.85
Containers	137.53	306.19	27.97	130.00	165.50	436.19
Others including Fert and FRM	178.09	301.19	51.52	163.30	229.61	464.49
Total	689.83	1,229.24	544.65	1,059.80	1,234.48	2,289.04

TABLE 15.38
Commodity Wise Traffic by the End of
Twelfth Plan (2016–17)

(Million Tonnes)			
Commodity	Major Ports	Non-Major Ports	Total
POL (incl. LNG)	249.49	230.70	480.19
Iron Ore	112.00	78.00	190.00
Fert and FRM	22.57	8.60	31.17
Coal	158.10	280.90	439.00
Containers	268.50	100.00	368.50
Others	132.40	117.00	249.40
Total	943.06	815.20	1,758.26

increase the draft to at least 14 meters in all Ports by the end of Twelfth Plan period and achieve 17 meters in Hub-Ports according to the potential of bigger size ships calling at these ports. In the Twelfth Plan, the requirement of capital dredging has been estimated at 221.11 MCuM for major ports and 418.03 MCuM for non-major ports, besides maintenance dredging of 404.25 MCuM and 125.58 MCuM, respectively.

15.184. The dredging capability of DCI is limited which needs to be enhanced substantially. The All India Dredging Cadre scheme needs to be strengthened and suitable measures have to be taken to retain the trained personnel. Suitable measures will need to be taken to overcome the time overrun experienced in dry docking of the existing dredgers. Long-term contracts with ports, which have continuous maintenance dredging needs to be developed. Financing of such ventures could help DCI to acquire new dredgers with equity support from such ports. Technological developments and innovations taking place in this area should be kept in mind and DCI should go for the latest technology in procuring the dredgers and in the execution of dredging.

Productivity and Dwell Time

15.185. To improve port efficiency and labour productivity, broad strategies like, creation of adequate port capacity with a gap of 30 per cent between the installed capacity and the traffic consistent with international norms, and the drafts of at least

14 meters up to 17 meters according to the potential of bigger size vessels calling at particular port is essential. Several Indian ports are unattractive due to high dwell time on account of customs and port side constraints like inadequate infrastructure (PH offer/test laboratories/testing procedures), absence of seamless connectivity with other modes, and various IT related bottlenecks.

Containerisation and Hinterland Connectivity

15.186. Containerised traffic is growing at a faster pace than other forms of traffic. In India too container cargo which formed only 15.8 per cent of total cargo handled in Major Ports in 2006–07 increased to 21.5 per cent per cent in 2011–12. The CAGR of container traffic was 5.2 per cent during the Eleventh Five Year Plan which was much higher than the overall growth of traffic of 1.5 per cent for Major Ports during the same period. The Twelfth Plan will therefore give due focus on increasing the share of containerised cargo in ports with a view to capturing a higher share of international trade. The projects for rail/road connectivity need to be taken up and monitored closely both for Major and non-Major Ports. For all these, ports, rail and road investments will be prioritised. Port traffic within India is carried largely by railways and road transport, with pipelines carrying crude oil and petroleum products. Railways are presently carrying considerably less than their optimal share of port traffic and road transport has made up the deficit partly with many negative externalities.

Private Sector Participation

15.187. The Private Sector participation will play a major role in realising the anticipated capacity augmentation in the ports during the Twelfth Plan. It is, therefore, imperative that PPP model is worked successfully and impediments removed. Specially, the system for security clearance for ports needs to be streamlined and made faster. There is also a need to expand existing framework to attract participation from the private sector for development of infrastructure facilities other than container terminals and berths such as are dredging, road infrastructure, creation of SEZ and development of integrated parking zones in the port area.

Non-Major Ports

15.188. An important component of the capacity creation is the development of non-major ports. The Indian Ports Association has information on a regular basis only about major ports, but has less details about progress of works in non-major ports. Considering the fact that nearly 1/3rd of the traffic is handled by them and it is likely to increase significantly during Twelfth Plan, this gap in the system needs to be rectified quickly.

Institutional Reforms and Corporatisation

15.189. Presently, Indian Ports Act, 1908 extends uniformly to all the ports in the country whereas, the Major Port Trusts Act, 1963 applies only to major ports. Though both the Acts have undergone piecemeal revisions to accommodate necessary changes from time to time, no comprehensive review of the various provisions of the Act was carried out so far. There is a need for reform to ensure growth and meet the international competitive environment.

15.190. The present institutional and regulatory arrangements are inadequate and deficient to meet the challenge of efficiency and bringing port services to world class standards. The ports management needs to be strengthened so that they work on commercial basis. Corporatisation is one way of achieving this by conversion of major ports trusts into truly commercial organisation. It is the process by which a port trust is converted into legally and financially independent entity with its own Board of Directors and governed by the provisions of the Companies Act. It is equally important that they are given full autonomy to respond quickly to the requirements of port development which are very large. We need to shift to landlord port organisational model quickly. The role of the state must be confined to setting policies and evolving strategies. Necessary reforms will be carried out during the Plan on the above approach.

Outlay for Shipping Sector in Twelfth Plan

15.191. The outlay for Shipping Sector in Twelfth Plan includes ₹6,960 crore as GBS and ₹21,990 crore as IEBR. In addition the private sector is expressed to invest nearly 1,70,000 crore in the Port Sector.

Some Major Initiatives in the Twelfth Plan

15.192. Some of the major initiatives for the Ports Sector is indicated below:

- Re-look at MCA to promote PPP in port sector
- Re-look at port regulation and tariff setting by TAMP by adopting practices consistent with the Landlord Port model.
- Capital Dredging to increase the draft of ports to at least 14 meters in all ports by the end of the Twelfth Plan and to achieve 17 meters in sub-ports according to the potential of trade.
- Investment in land infrastructure including modern cranes, silos/ warehouses, ICDs, connectivity and so on.
- Move towards greater flexibility for decision making by Port Trusts through greater delegation of powers.
- Landlord port model.
- Corporatisation of major ports in the long run.

CIVIL AVIATION

Overview

15.193. The Civil Aviation services have expanded rapidly with the opening up of domestic skies to private carriers in the second half of the Tenth Plan through PPP investment in the airport infrastructure. The sector contributes significantly to development by generating employment opportunities directly and indirectly besides facilitating enhancement of productivity and efficiency in the movement of goods and services.

Review of the Eleventh Plan

15.194. The Eleventh Plan aimed to provide world class infrastructure for safe, reliable, and affordable air services so as to encourage growth in passenger and cargo traffic, and air connectivity to remote and inaccessible areas with special reference to North-Eastern part of the country.

15.195. Against an investment target of ₹49,267.00 crore comprising of ₹1,900.00 crore as budgetary support and ₹47,367.00 crore as IEBR, the anticipated expenditure during Eleventh Plan period is

₹44,124.00 crore comprising of IEBR of ₹39,571.11 crore and budgetary support of ₹4,552.89 crore. Thus there would be a shortfall of ₹5,143.00 crore (10.44 per cent) in utilisation of the approved outlay. The anticipated utilisation under budgetary support would be 239.63 per cent and 83.54 per cent under IEBR.

15.196. The Indian civil aviation industry managed to exhibit resilience in face of the recent global economic slowdown. Both passenger and cargo traffic have shown robust growth and there has been modernisation and augmentation of capacities, in a major way, at various metro and non-metro airports. Some of the key developments during last five years include the following:

- India has become the ninth largest civil aviation market in the world;
- Passenger handling capacity has risen three-folds from 72 million (FY 06) to over 220 million (FY 11);
- Cargo handling capacity has risen from 0.5 million MT (FY 06) to 3.3 million MT (FY 11);

- Connectivity to North Eastern region has risen from 87 flights per week to 286 flights per week;
- Four international airport projects were successfully completed through the public-private partnership (PPP) mode, viz. greenfield development of Hyderabad and Bengaluru international airports and modernisation of Delhi and Mumbai international airports (Box 15.12);
- The Airport Economic Regulatory Authority (AERA) was established to safeguard the interests of users and service providers at Indian airports; and
- As of now five Indian carriers are operating on international routes.

Twelfth Plan

Objectives

15.197. The Plan aims to propel India among the top five civil aviation markets in the world by providing access to safe, secure and affordable air services to everyone through an appropriate regulatory framework and by developing world class infrastructure facilities (Table 15.39).

Box 15.12

Development of Airports During the Eleventh Plan

The Private sector played an unprecedented role during the Eleventh Plan in the area of airport development. Five international airport projects were successfully completed through the public-private partnership (PPP) mode, viz. greenfield development of Hyderabad and Bengaluru international airports and modernisation of Kochi, Delhi and Mumbai international airports. Total investment made by private airport operators in the last five years was to the tune of ₹30,000 crore. Along with the private sector, Airport Authority of India (AAI) has continued to create airport infrastructure at a rapid pace incurring an expenditure of ₹12,500 crores during the Eleventh Plan. AAI is upgrading and modernising 35 non-metro airports in the country including those at Agra, Ahmedabad, Amritsar, Bhopal, Jaipur, Pune and Goa, at an estimated cost of around ₹4,500 crore. Of these 35 airports, 26 have already been developed, while the remaining are likely to be completed by end of 2012. AAI is also enhancing air connectivity in the North-East by way of Greenfield airport at Pakyong (Sikkim).

The Delhi, Mumbai, Bengaluru, Hyderabad and Cochin now have airports that compare very well internationally. A major achievement during the Eleventh Plan was the commissioning of terminal 3 (T3) and associated infrastructure at Delhi international airport in a record period of 37 months. The Chennai and Kolkata airports are also being modernised and expanded by the Airports Authority of India (AAI). These airports handle 60 per cent of the air traffic in the country. The passenger handling capacity has increased from 13.83 to 60 million at Delhi; 18.50 to 25 million at Mumbai; 3.25 to 9.78 million at Bengaluru; 3.60 to 12 million at Hyderabad; 3.46 to 5 million at Kochi; 7.74 to 23 million at Chennai and 4.06 to 24.06 million at Kolkata during the Eleventh Plan period. Airport capacity in these cities is therefore considered adequate till the end of the Twelfth Plan period except for the city of Mumbai where the total capacity required at the end of Twelfth Plan would be 50.27 million against the total capacity creation of 40 million by the end of Twelfth Plan. Since, the capacity required and the capacity created would not match, there is need for developing another airport at Mumbai.

Traffic Projections

TABLE 15.39
Growth Projections for the Twelfth Five Year Plan:
Passenger and Cargo Traffic Forecasts

Passenger/Freight	2011	2016–17	Average Annual Rate of Growth
Passenger (Million)			
(i) Domestic	106	209	12 %
(ii) International	38	60	8 %
Cargo (MMTPA)			
(i) Domestic	0.9	1.7	12 %
(ii) International	1.5	2.7	10 %

Strategies

15.198. To realise objectives of the Twelfth Plan, (i) aircraft and airport capacities would be increased, (ii) airports to be modernised and upgraded to increase passenger facilities and to speed up cargo clearance, strengthen security and safety measures for safe and reliable air services, (iii) improve air connectivity to NE Region, other remote areas and tourist destinations, create right infrastructure for the rapid growth of helicopter operations, (iv) introduce seaplane operations, (v) to generate employment and to provide better infrastructure for training to make available qualified human resources, and (vi) strengthening of regulatory framework on safety and economic regulatory aspects of Civil Aviation, by setting up Civil Aviation Authority.

Airport Infrastructure

15.199. Passenger terminal capacity in all airports put together is expected to be 230-240 million by 2012 and by 2017 it would be about 370 million as per the investment plans of the operators. Cargo growth presently being witnessed will necessitate investment in specialised cargo terminal and equipment. Independent estimates suggest an additional requirement of 30 functional airports by 2017 and about 180 functional airports in all over the next 10 years. Thus, growth in the passenger and cargo traffic requires significant investments for construction of new airports, expansion and modernisation of

existing airports, improvement in connecting infrastructure (road, metro, sea link, and so on.) and better airspace management.

15.200. Budgetary support from Government for investment in development of airports in remote areas and regions which need special consideration from socio economic and connectivity point of view would be taken care by the AAI. Regional airport development to cater to the emerging air traffic in Tier II and Tier III towns may initially require budgetary support during the initial period of its operations and until such time the operations become viable. Even at present, there are only 12–13 airports of AAI that are making profit at current level of operations.

15.201. Indian airports would require to meet the traffic growth projections an investment of about ₹67,500 crores during the Twelfth Plan, of which around ₹50,000 crore is likely to be contributed by the Private Sector (Table 15.40).

TABLE 15.40
Investment Requirements during the Twelfth Plan

Investor	Investment Category	₹ in crore
AAI	Airport projects	17,500
Private Investments	By Airport Operator	40,000
	By Others (Concessionaires, Third Party, and so on.)	10,000
TOTAL		67,500

Air Navigation Services (ANS)

15.202. Air Space and Air Traffic Management infrastructure assumes critical importance in the context of the Indian Air Transport sector transitioning to the next growth phase. Broadly, it involves deployment of equipment relating to CNS (Communication Navigation and Surveillance) and Air Traffic Management Systems. Presently air navigation services in India are provided by the Airport Authority of India. An important initiative that needs to be pursued and implemented is separation of Air traffic control (ATC) from airport authority of India (AAI) in line with the best practices in the world. It has been suggested that in addition to adequate investment proposed in ANS infrastructure during

Box 15.13
GAGAN—The Indian Satellite Based Augmentation System (SBAS) for
Air Navigation Services (ANS)

GAGAN, the Indian SBAS (Satellite Based Augmentation System) is a project jointly undertaken by the Airport Authority of India and ISRO to achieve smooth transition to satellite based navigation and seamless air traffic management across continents. GAGAN is designed to provide additional accuracy, availability, and integrity necessary to enable user to rely on GPS for all phases of flight, from en route through approach, for all qualified airports within the GAGAN service volume.

GAGAN will provide the capability for increased accuracy in position reporting, thereby making possible high-quality Air Traffic Management (ATM). GAGAN will provide benefits beyond aviation to all modes of transportation, including maritime, highways, railways and public services such as defense services, security agencies, and disaster recovery management by aiding in search and rescue to locate the disaster zone accurately, telecom industry and personal users of position location applications.

After USA, Japan and Europe, India has taken up the challenge of establishing the regional SBAS that will redefine the navigation in India and in adjacent regions. The footprint of GAGAN will cover huge area beyond Indian Territory, from Africa to Australia and can support seamless navigation across the globe. The system is also interoperable with other such systems of WAAS of USA, EGNOS of Europe and MSAT of Japan.

The lead taken by the Ministry of Civil Aviation in implementing GAGAN and possible certification by 2014 will propel India as the only fourth country to have this facility in the world.

the Twelfth Plan, an independent Air Navigation Services Corporation should be set up to manage capacity, safety, congestion and efficiency issues of air transport.

15.203. The Ministry of Civil Aviation has constituted a Committee for formulating the next generation ANS master plan to enhance capacity and safety levels in the face of higher air traffic movements in future. The ANS infrastructure would move towards greater integration and automation with implementation of state-of-the-art technologies. The system would include a centralised Air Traffic Flow Management with networked VHF and Radars capable of providing dynamic sectors, which permits alignment with traffic pattern. Existing software and hardware infrastructure would be upgraded or replaced. It is estimated that an investment of ₹4,400 crore will be made into this sector during the Twelfth Plan of which ₹3,700 crore would be in ANS infrastructure and air safety and ₹700 crore in the GAGAN (see Box 15.13) project.

Air Lines

15.204. Anticipating significant growth in traffic, most Indian carriers have placed orders to augment their aircraft fleet. According to an estimate, airlines in

India are expected to add around 370 aircrafts worth ₹1,50,000 crores to their fleet by 2017. Fleet expansion at this scale would require airlines to explore multiple funding options including capital markets, long-term borrowings and leasing, and so on.

Aviation Turbine Fuel

15.205. A major difficulty being faced by airlines is the high cost of Aviation Turbine Fuel (ATF), which is further aggravated by taxes. Viewed in inter-modal context, it is desirable to rationalise ATF pricing and to review the tax structure so that Airline operation becomes viable. The cost of ATF constitutes 40–50 per cent of the total operating cost and thus is a formidable challenge for the financial health of airlines. This has been a long standing issue that requires an immediate resolution. ATF prices in India are distorted because it is subjected to a multitude of cascading taxes by different government entities despite being an input fuel (similar to coal and gas); it is subjected to sales tax as high as 30 per cent. It is nearly 60 per cent costlier than competing hubs like Dubai, Singapore and Kuala Lumpur and hurts India's competitiveness. The comparison of ATF prices in India with competing hubs has been detailed below (Table 15.41)

TABLE 15.41
Comparison of ATF Prices in India with
Competing Hubs

Location	Price/Kilolitre (USD)
India	1,400
Singapore	825
Bangkok	880
Kuala Lumpur	810
Dubai	840

15.206. Due to the distortion in the price structure caused by the taxation policies, the financial viability of airlines is getting strongly affected. Either ATF should be included in the unified Goods and Services Tax or ATF should be accorded the status of “Declared Good” that carries lower and uniform tax rate.

Multi-Modal Connectivity

15.207. The major airports in India are mostly at a considerable distance from the city centre. Apart from causing inconvenience to the passengers, this also adversely affects the comparative advantage in terms of saving in time otherwise enjoyed by other modes of transport. These airports need to be connected to cities by metros and expressways to get full advantage of air transportation by reducing the total travel time, as has been done in the case of IGI Airport, New Delhi.

Foreign Equity Participation

15.208. The Domestic Air Transport Policy approved by the government provides for foreign equity participation up to 49 per cent and investment by non-resident Indians (NRIs) up to 100 per cent in the domestic air transport services. With a view to attracting new technology and management expertise, government has permitted up to 49 per cent Foreign Direct Investment (FDI) by foreign airlines in Indian airline companies.

Air Cargo

15.209. The current share of air-cargo compared to other modes of cargo-transportation is fairly low in India. The potential for air-cargo growth in India can be gauged from the fact that some of the global

airports such as Hong Kong, Dubai and Incheon (Seoul) handle cargo volumes which are much more than at Indian airports. The present operating parameters (daily throughput, dwell times) at most air-cargo terminals of the country are far from international best-practices. The following key enablers would be imperative for growth of India’s air-cargo industry:

1. Higher Automation: Poor cargo handling infrastructure at airports leads to spoilage and pilferage, increased turnaround times and degradation in the quality of items causing perception issues for Indian exports. There is an urgent need to facilitate efficiency in air-cargo through IT tools and automated material handling.
2. India as a Trans-shipment Cargo Hub: Given its geographic location, India can aspire to become an international cargo hub. To begin with, India needs to facilitate trans-shipment of cargo to and from our neighboring countries, many of whom do not have regular air services to key markets in Europe and America.
3. Trans-shipment at Indian airports is currently negligible. Major bottlenecks are absence of dedicated trans-shipment infrastructure at airports and lack of clarity on the trans-shipment procedures. Conservative estimates by KPMG indicate that the Indian subcontinent alone can offer trans-shipment opportunity of 80,000-1,00,000 MT per annum.
4. Dwell Time Reduction: Cargo dwell times for large Indian airports currently range from 3 to 5 days as compared to an average of 4 to 12 hours at leading global airports. Reduction in dwell time and faster clearance of cargo are extremely critical for India.
5. 24×7 Customs Operation: A review of the current customs clearance procedures is extremely important. There is also a serious need for Indian Customs to operate in a 24×7 environment. This would require close and regular interaction between MoCA, Central Board of Customs and Excise (CBEC) and the industry.
6. Establishment of Air-Freight Stations (AFS) in the hinterland: A significant amount of congestion, damage and pilferage is caused by the

current practice of cargo being brought to terminal in loose units which is then unitised into pallets or containers before being loaded onto aircrafts. This problem can be alleviated by setting up AFSs' in the hinterland. Customs check, X-ray screening and palletisation can take place at the AFS and airport terminals would only act as a 'processing gateway' between airlines and cargo carriers. Success of Containers Freight Stations (CFS) for marine cargo is a clear indication of the need for a similar concept in the air-cargo industry.

Maintenance, Repair and Overhaul (MRO)

15.210. Indian MRO industry is expected to triple in size from ₹2,250 crore in 2010 to ₹7,000 crore by 2020. However, this may still be small compared to the present MRO industry size of other countries such as UAE (₹8,000 crore per annum) and China (₹10,000 crore per annum). India has the potential to be an MRO hub due to the growing aircraft fleet, locational advantage and availability of talent. Given the growth of Indian aviation, it is logical to encourage MRO infrastructure to support the growth in the sector.

Ground Handling

15.211. By 2017, ground handling market is expected to double from present ₹2,000 crore to ₹3,900 crore. A number of global ground-handling players have aggressive expansion plans in India. This would, however, depend significantly on supportive policies and requisite airport infrastructure development.

Regional Airlines

15.212. To tap the vast potential of growth of traffic and to encourage balanced growth of civil aviation, regional airlines need to be promoted. The promotion of regional airlines would, however, be through more liberal policy and provision of better infrastructure facilities. The rules and procedures governing the entry may also be simplified.

Other Challenges

Route Dispersal Guidelines (RDG)

15.213. In accordance with the Route Dispersal Guidelines, all routes were divided into three

categories, viz. Category I, II and III. Route categorisation was based on traditionally surplus generating routes (Category I), loss making routes (Category II) and the remaining routes (Category III). The Category I routes were largely inter-metro routes and generated surplus that cross-subsidised losses largely on Category II routes which served regions of difficult terrain and destinations in remote areas. Implementation of Route dispersal guidelines aimed at ensuring that all players in the liberalised era would deploy capacity to destinations in remote areas and would participate equitably in providing air transportation to remote areas.

Air Connectivity in North Eastern Region and Other Remote Areas

15.214. North-East Region of India comprises of eight states viz. Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. Most of the places in the North-Eastern states are inaccessible due to inadequate road/rail facilities. Only viable means of transportation in the region is by air. At present, air services are available to/from 11 airports in the North Eastern Region. During last five years from 2006–2011, total number of flights operated on domestic network vis-à-vis flights in North-Eastern Region, Jammu & Kashmir Region, Andaman & Nicobar Island and Lakshadweep Island are indicated in Table 15.42.

15.215. The connectivity to NER, J&K, A&N Islands and Lakshadweep has grown at 43 per cent, 72 per cent, 75 per cent and 67 per cent respectively which are higher than growth in total domestic Network of 39 per cent during the period from 2006 to 2011. In addition to scheduled air services, non-scheduled air services are being provided by North East Shuttle (a non-scheduled operator) with small aircraft. Pawan Hans Helicopters Ltd is also providing helicopter services in Arunachal Pradesh, Meghalaya, Tripura and Sikkim with subsidy from Government for carriage of passengers, emergency/medical evacuation. A private Helicopter operator also operates passenger services in Arunachal Pradesh.

15.216. Despite some degree of success of Route Dispersal Guidelines in ensuring air connectivity to

TABLE 15.42
Flights/Week

Flight Details	2006	2007	2008	2009	2010	2011
Total on Domestic Network	8,724	10,624	11,048	1,063	11,315	12,107
North-Eastern Region	259	285	298	286	347	370
Jammu & Kashmir	104	116	110	113	120	179
Andaman & Nicobar Island	24	42	42	35	40	42
Lakshadweep Island	06	13	10	07	13	10

North-Eastern Region, Jammu & Kashmir and other places, air connectivity has largely been confined to few airports in these regions. The air connectivity is largely concentrated on routes connecting state capitals. Air connectivity has not increased proportionately on routes connecting Island airports. Although all the scheduled domestic airlines are complying with mandatory capacity deployment requirements contained in Route Dispersal Guidelines, however, some parts of the country still remain unconnected by air services or partly connected. A sustainable and durable solution in the long run could be found only in direct intervention by way of development of small low cost 'no-frill' airports and regional airlines through providing direct subsidies in a transparent manner both for airport operator and for the carrier. As of now there are 22 airports and civil enclaves in the NER. Amongst these there are seven fully operational AAI airports at Agartala, Barapani, Dibrugarh, Guwahati, Imphal and Lilabari. Besides there are four civil enclaves at Jorhat, Bagdogra, Silchar and Tejpur. AAI has plans to develop Guwahati as an inter-regional hub and Dibrugarh, Imphal and Agartala as intra-regional hub. As a low cost airport, to begin with, AAI would be developing Daparizo Airport in Arunchal Pradesh for 20 seater aircraft in phase I. Similarly the other airports in the region could be identified for developing as small airports suitable for small carriers keeping in view the strategic and socio-economic development needs of the areas.

Safety

15.217. With the advancement and growth in aviation activities in India, the challenges to keep the skies safe need to be met appropriately. Safety is of paramount importance. As the number of operations increase, it

is a challenging task to keep the rate of accident and incident in check. The congestion in the skies also poses a threat of near-misses and collision warnings. The increase in number of movements affects runway safety, ramp safety, incursions and excursions, ramp congestion, precautionary landings, aborted take offs, and other serious situations affecting safety. The implementation of Safety Programme by DGCA and safety management systems by all stake holders needs to be ensured. It is proposed to further strengthen DGCA during the Plan. Dedicated staff for the training academy has already been sanctioned. As a joint venture with AAI, the training academy will ensure technical capability of the highest level to enhance the skills of officials in various fields

Human Resource Development

15.218. It has been estimated that total manpower requirement of airlines will rise from 62,000 in FY 2011 to 1,17,000 by FY 2017. This includes number of pilots, cabin crew, aircrafts engineers and technicians (MRO), ground handling staff, cargo handling staff, administrative and sales staff. India currently has over 4,500 pilots, including 400 expatriates. With the doubling of fleet size expected by 2017, India will require a total of around 9,000 pilots by 2017. This implies an average addition of at least 800 pilots per year for the next five years, not accounting for attrition and replacements of expatriate pilots (about 400), required to be phased out by end of 2013. Currently 23 out of 40 institutes for pilot training are non-operational. The remaining 17 institutes offer training facilities for commercial pilots with an annual turnover of over 100 pilots. There is acute shortage of trained pilots/commanders in India. In addition, many courses of some of the pilot training institutes are not recognised by DGCA, leading to

high rejection rates. Exams are conducted every three months compared to weekly exams in developed countries. It is necessary to meet these gaps in the Twelfth Plan and increase facilities for human resource development.

Current Regulatory Environment in Civil Aviation Sector

15.219. In order to regulate tariff and other charges for the aeronautical services rendered at airports and to monitor performance of airports, Airports Economic Regulatory Authority of India was set up in 2008 through an Act of Parliament. DGCA performs safety oversight functions of airline industry, and limited Economic Regulation covering fares, rates, services affecting such fares and rates.

15.220. Globally, Civil Aviation sector is regulated by independent regulators. Therefore, creation of a Civil Aviation Authority as a unified regulator covering both safety and economic aspects of airline industry is the need of the hour. Existing Directorate General of Civil Aviation could be subsumed in the proposed Civil Aviation Authority as an enforcement wing. CAA will be the regulatory policy making body which will also have administrative control over the enforcement wing (the present DGCA) to ensure the implementation of its regulatory decisions. Setting up of independent and autonomous regulatory body is not only consistent with international best practices but also essential to meet the challenges of a growing industry with multiple players from both India and abroad. Independent Regulators are mandated to adopt transparent process in decision making, which is necessary to impart regulatory certainty to investors current and potential.

National Aviation University

15.221. A skilled and competent workforce is essential to create a safe and efficient aviation industry. Without this India cannot join the ranks of the leading aviation nations. A vibrant, world class education and training sector is therefore essential to meet the rising demand for skilled workforce at all levels. It is found that there is a near absence of qualitative and duly recognised formal Educational programme

leading to award of Diploma/Degree/Post Graduate Degree in the field of Civil Aviation in the country. As a result of this, all major as well as minor agencies/organisations in the sector have to mostly recruit persons and invest considerable resources in post recruitment training. It is therefore necessary to establish National Aviation University to cater to the growing educational and training requirements of the Civil Aviation Sector on the pattern of National Maritime University which has been established under the Ministry of Shipping, Government of India for the purpose of development of Human Resources for Shipping and Ports sector

Development of Aerospace Industry

15.222. Considering the growth prospects of Air Traffic in the country, the potential for large scale acquisition of aircrafts by the carriers in India, and the competitive advantages arising out of growing pool of scientific and technical manpower in the country it is felt necessary to consider initiating activities towards development of aerospace industry. Independent traffic forecasts suggest that by 2020 or so, the number of aircraft required in the Indian market would exceed one thousand. Most of the requirements would be in the narrow body segment to cater to the needs of Tier II and Tier III towns. Also India could capture the pie of Aerospace outsourcing due to significant cost advantages. Skilled labour costs are currently far less than USA and Europe. Therefore, there is a need to take up Aerospace development programmes in the country for meeting the needs of Civilian aircraft.

Establishment of Civil Aviation Museum

15.223. The Civil Aviation Museum shall enshrine the evolution and development of aviation and spaceflight in India, and so seek to educate and inspire the nation by preserving and displaying aeronautical and spaceflight material and data of technical and historical interest and significance to national programmes; developing educational material and conducting programmes to enhance public understanding of and involvement in, the development of aviation and spaceflight and conducting

and disseminating new knowledge on aviation and spaceflight and their related technologies. The aim is to archive the development of aviation in India, collect, preserve and display aeronautical equipment and provide educational material for the study of aviation and spaceflight sciences.

MOCA Institutions

Air India Limited

15.224. Against the Eleventh Plan approved outlay of ₹32,730.71 crore, the anticipated expenditure of Air India Ltd during Eleventh Plan period would be ₹28,203.04 crore including the budgetary support of ₹3,200.05 crore in the form of equity infusion. Air India Ltd ordered 93 aircraft comprising of 50 Boeing and 43 Airbus aircrafts. Out of these 93 aircrafts, 85 aircrafts were projected to be received during the Eleventh Plan period. The physical and financial performances of Air India Limited are given at Annexures 15.5 and 15.6.

Airport Authority of India

15.225. The approved Eleventh Plan outlay of Airports Authority of India was ₹12,964.21 crore, including budgetary support of ₹1,461.68 crore. Out of ₹12,964.21 crore, ₹6,973.40 crore was provided for non-metro airports and the balance of ₹5,990.81 crore for metro airports. The anticipated expenditure of Airports Authority of India during Eleventh Plan period would be ₹12,547.56 crore including budgetary support of ₹850.61 crore. The financial performance of Airports Authority of India during Eleventh Plan period is given in Annexure 15.7.

Pawan Hans Helicopters Limited

15.226. The approved Eleventh Plan outlay of Pawan Hans Helicopters Limited was ₹603.50 crore including budgetary support of ₹20.00 crore against which the anticipated expenditure during Eleventh Plan period would be ₹797.26 crore including budgetary support of ₹58.00 crore. Major portion of the Eleventh Plan outlay was earmarked for acquisition of helicopters. Details of performance is enclosed in Annexure 15.8.

Hotel Corporation of India Limited

15.227. The Eleventh Plan approved outlay of Hotel Corporation of India Limited is ₹75.00 crore, against which the anticipated expenditure is ₹43.75 crore.

Directorate General of Civil Aviation

15.228. The anticipated expenditure of Directorate General of Civil Aviation during Eleventh Plan period is ₹210.19 crores against the approved outlay of ₹258.80 crores. The major scheme of the Directorate envisaged for implementation during Eleventh Five Year Plan period is 'New Flying training Academy in Gondia' for training of pilots.

15.229. The endeavor of Directorate General of Civil Aviation (DGCA) during Twelfth Plan period will be to promote safe and efficient Air Transportation through regulation and proactive safety oversight system. Schemes proposed under the Twelfth Plan are aimed at DGCA's capacity building.

Bureau of Civil Aviation Security

15.230. During Eleventh Plan period, the Bureau of Civil Aviation Security (BCAS) is likely to spend ₹73.31 crore as against actual allocation of ₹222 crore. One of the major schemes, namely, setting up of Civil Aviation Security Training Academy is at approval stage. Implementation of the restructuring and strengthening of BCAS which includes creation of infrastructure of office building, acquisition of some modern equipment including enhancing the manpower requirement at both the BCAS Headquarters and regional level is going slowly. The Bureau of Civil Aviation Security is working out its future plans of strengthening organisationally and technologically vis-à-vis the current security scenario.

Indira Gandhi Rashtriya Uran Akademi

15.231. Indira Gandhi Rashtriya Uran Akademi (IGRUA) is an autonomous body. A management contract was signed with CAE Flight Training (India) Private Limited, a wholly owned subsidiary of CAE Inc, Canada on 7.2.2008 for an initial period of 10 years without affecting the legal entity of IGRUA. IGRUA is provided grants-in-aid to

pursue its plan projects. Against the approved outlay of ₹42.00 crore, the anticipated expenditure of IGRUA during Eleventh Plan period is ₹41.00 crore. Facilities at IGRUA have been upgraded to impart training to 100 pilots per year. IGRUA has projected an outlay of ₹95.00 crore for Twelfth Plan period for purchase of additional 14 aircrafts, setting up of MRO hub and AME school at IGRUA and extension of tarmac at Sultanpur for parking IGRUA aircraft.

Aero Club of India

15.232. Aero Club of India is granted grants-in-aid for its plan projects. The anticipated expenditure of Aero Club of India is ₹31.65 crores against the Eleventh Plan approved outlay of ₹35.32 crores.

Major Initiatives to be Taken by Moca in the Twelfth Plan

- Doubling of passenger handling capacity of Airports primarily through private investments (PPP).
- Setting up of Unified Regulatory Agents.
- Up gradation of Air Navigation Services (ANS) using the latest technology.
- Encouraging emergence of regional airlines to cater to air transport needs of Tier II and Tier III towns and promoting low cost carriers for this purpose.
- New Policy for ATF to improve Airline competitiveness.
- Policy on increased foreign direct investments, including by foreign airlines in domestic airlines.
- Policy on MRO to encourage establishment of dedicated MRO hubs through joint ventures with MRO service providers and airport companies. This would also encourage mechanisation and modern ground handling processes for greater efficiency.
- Revised policy on Route Dispersal Guidelines to improve services to far flung and inaccessible areas.
- Setting up of National Aviation University to meet critical skill development needs of the aviation Sector.

Investments During Twelfth Five Year Plan for Civil Aviation

15.233. The projected investment during Twelfth Five Year Plan from Central sector is expected to be ₹33,198 crore of which ₹16,983 crore is from GBS and ₹16,215 crore from IEBR. Out of the GBS of ₹16,983 crore, ₹15,096 crore is earmarked for Air India and ₹1,887 crore for all other plan schemes/programmes for the Ministry. Besides, an investment of ₹50,000 crore comprising ₹40,000 crore from private investment and ₹10,000 crore by others including concessioners, third party and so on have been projected to be made in airport projects during the Twelfth Five Year Plan.

NORTH EAST REGION

15.234. The North East region has a number of characteristics that make it imperative for more organised inter-sectoral planning to be done for transportation in the region: it is remote from the rest of India; several areas feature difficult hilly terrain; it also has many rivers, which can permit significant inland water transport options, but also contribute to difficulties in engineering transport infrastructure; it has a long border with neighbouring countries which increases the importance of transport infrastructure from a strategic and security viewpoint; and it consists of 8 states, each of which have their own requirements and priorities. A region-wide transport planning for the four transport sectors – roads, civil aviation, rail, and inland waterways – in an integrated framework is therefore required.

Railways

15.235. A decision has already been taken to connect all the state capitals in the North East with the rest of the country. The state capitals of Assam and Tripura are already connected. New lines for connecting state capitals of Arunachal Pradesh, Manipur, Nagaland, Mizoram and Meghalaya have been sanctioned and works are in progress. In the Twelfth Five Year Plan, the work on these railway lines will be expedited so that all state capitals in the North East Region are on the rail map by 2020.

Roads

15.236. A number of programmes such as the SARDP-NE have been launched for the development of National Highways, State Highways and other roads in the North East Region. As a result of these programmes investments have been increasing. As a matter of fact, the implementing agencies are unable to spend the allocated amount and complete the projects in time. Hence there is a great need for capacity augmentation and institutional strengthening in the areas related to evolving of projects, preparation of project reports, implementation, monitoring and management of projects in the North East region as a whole.

Air Connectivity

15.237. Considering the importance of civil aviation to the development of the NER, a new policy centred around small aircrafts is required to implement a hub-and-spoke model. With more frequent flights in and out of this geographically difficult region, there may be considerable reduction in the physical exclusion of the region. The development of existing airports and operationalisation of non-operational airports would not only make air links feasible between the state capitals but also with neighbouring countries. Multi-utility based air services which enable the movement of high value cargo can also be instrumental in improving the economic vitality of the region. However, in order to achieve the objective of uninterrupted and reliable air services and to prevent accidents, there is a need to develop state of the

art weather and navigation information systems and human resources together with the actual physical airport infrastructure. Guwahati Airport should also be developed as a potential major gateway to South East Asia, both for passenger and freight traffic.

Inland Water Transport

15.238. IWT has a natural fit with the bulk commodities that the North East Region imports from the rest of India. Tea, oil, cement and coal are exported, while food grains, fertilisers and petroleum products are imported. All these items are non-perishable and transported in high volumes, making them suitable for transportation by IWT. Major development of IWT requires participation by Bangladesh. The Indo-Bangladesh Protocol on Inland Water Transit and Trade already exists. Efforts would be made to extend the validity of this protocol for at least 20 years. This would provide stability to the trading environment and hence enable appropriate investment planning in both the public and private sectors. It would also clear the way for the development of public private partnerships in the development, management and operation of inland water transport in the region.

TWELFTH PLAN OUTLAY

15.239. The indicative Gross Budgetary Support and IEER for Twelfth Five Year Plan for various Ministries in the Transport Sector is Given below (Table 15.43):

TABLE 15.43
Ministry/Department – wise Twelfth Five Year Plan (2012–17) Outlays for Transport Sectors

Sl. No.	Ministry	(in ₹ crore)	
		Twelfth Plan (2012–17) GBS Outlays	IEER
1.	Ministry of Road Transport and Highways	1,44,769	64,834
2.	Ministry of Civil Aviation	16,983	16,215
3.	Ministry of Railways	1,94,221	2,25,000
4.	Ministry of Shipping	6,960	21,990
5.	PMGSY (part of Rural Development Allocation)	1,26,491	–

ANNEXURE 15.1
Central Road Sector Outlay and Expenditure-At Current Price for Eleventh Plan

S No	Schemes/Programmes	Eleventh Plan (2007-12) Outlay	2007-08		2008-09		2009-10		2010-11		2011-12		Total Outlay for the Eleventh Plan (BE)	Total Expenditure at Current Prices (prov. for 2011-12)
			BE	Exp.	BE	Exp.	BE	Exp.	BE	Exp. (Prov.)				
1	2	3	4	6	7	9	10	12	13	15	16	18	19	20
1	External aided projects													
	(i) External aided (RW)	0.00											0.00	0.00
	(ii) Counterpart funds (RW)	0.00											0.00	0.00
	EAP Ministry	0.00											0.00	0.00
	(iii) Externally aided (NHAI)	3,563.20	1,788.80	1,776.00	1,515.00	1,515.00	272.00	272.00	320.00	320.00			3,895.80	3,883.00
	(iv) Counterpart funds (NHAI)	0.00									20.00	0.00	20.00	0.00
	(v) Loan to NHAI	890.80	447.20	444.00	379.00	379.00	68.00	68.00	80.00	80.00			974.20	971.00
	(vi) EAP under RW								100.00		80.00	0.00	180.00	0.00
	EAP-NHAI	4,454.00	2,236.00	2,220.00	1,894.00	1,894.00	340.00	340.00	500.00	400.00	100.00	0.00	5,070.00	4,854.00
	(vii) Strengthening of PIC	0.00											0.00	0.00
2	Other Schemes-NH (O)	16,500.00	2,079.25	2,011.07	2,142.79	2,852.70	3,342.55	4,298.12	3,958.10	4,496.35	4,964.34	4,519.58	16,487.03	18,177.82
3	Rail cum Road Bridge, Munger, Bihar	392.00			40.00	40.00	60.00	60.00	100.00	100.00	180.00	72.00	380.00	272.00
4	Development of roads in LWE affected area						500.00	5.00	1,000.00	718.05	825.00	792.47	2,325.00	1,515.52
5	Development of Vijawada-Ranchi Road						200.00	0.00	100.00	0.00	100.00	67.25	400.00	67.25
6	Tribal Sub Plan										375.00	374.96	375.00	374.96
7	Mughal Road in Jammu & Kashmir	127.50			30.00	0.00	20.00	0.00		0.00			50.00	0.00
8	Improvement of Duburi-Brahmanipal-Harichandanpur-Naranpur State Road in Orissa (POSCO)	140.85			40.00	40.00	30.00	0.00	20.00	0.00	33.02	33.02	123.02	73.02

9	Works under BRDB	2,500.00	499.76	623.93	650.00	645.80	600.00	723.49	700.00	693.00	700.00	515.00	3,149.76	3,201.22
10	Travel expenses (domestic)				2.00	1.24	2.00	1.20	2.00	1.31	2.00	1.22	8.00	4.97
11	Other charges	64.00	0.50	0.50	0.50	0.13	0.50	0.00	0.50	0.03	0.50	0.00	2.50	0.66
12	Development of Information Technology		9.50	0.32	3.50	0.71	3.50	3.05	3.50	1.10	3.50	1.74	23.50	6.92
13	Strategic roads under Roads Wing	0.00	7.00	6.35					5.00	0.00			12.00	6.35
14	Strategic roads under BRDB	500.00	67.00	61.45	78.00	76.96	60.00	82.17	100.00	72.66	105.00	53.00	410.00	346.24
15	R&D Planning studies	100.00	8.50	0.20	8.50	0.71	5.50	3.84	6.00	0.92	5.50	0.48	34.00	6.15
16	Training		1.50	0.35	1.50	0.16	1.50	0.39	1.50	0.00	1.50	0.11	7.50	1.01
17	Machinery and equipments				10.00	3.07	15.00	0.53	15.00	0.01	5.00	0.00	45.00	3.61
18	Charged expenditure	36.00	6.00	5.93	6.00	2.07	6.00	5.32	6.00	0.21	7.00	0.00	31.00	13.53
19	NHAI (investment)	36,238.00	6,541.06	6,541.06	6,972.47	6,972.47	8,578.45	7,404.70	7,848.98	8,440.94	8,250.00	6,187.00	38,190.96	35,546.17
20	E&I for States from CRF	900.00	264.93	169.70	180.74	175.65	216.97	104.35	195.75	208.23	232.27	173.74	1,090.66	831.67
21	E&I for UTs from CRF		9.00	1.60	10.00	0.00	16.03	0.00	14.67	0.00	17.48	2.04	67.18	3.64
22	NHDP-III, two-laning expressways and six-laning												0.00	0.00
23	SARDP-NE	9,877.65	710.00	698.02	1,200.00	643.72	1,200.00	658.55	1,500.00	1,044.49	1,600.00	1,939.98	6,210.00	4,984.76
24	Strategic roads in Arunachal Pradesh under Ministry of Defense												0.00	0.00
25	NHAI(Toll Remittance)								1,623.00	1,623.00	2,092.89	2,692.89	3,715.89	4,315.89
26	Total (GBS)	71,830.00	12,440.00	12,340.48	13,270.00	13,349.39	15,198.00	13,690.71	17,700.00	17,800.30	19,600.00	17,426.48	78,158.00	74,607.36
	IEBR	34,829.00	2,090.00	305.18	4,100.00	1,630.74	5,000.00	1,273.26	7,455.00	2,100.00	17,500.00	12,500.00	36,145.00	17,809.18
	Total GBS + IEBR	1,06,659.00	14,530.00	12,645.66	17,370.00	14,980.13	20,198.00	14,963.97	25,155.00	19,900.30	37,100.00	29,926.48	1,14,303.00	92,416.54
	Private Sector Investment	86,792.00	7,325.00	7,057.38	13,938.00	8,179.75	16,071.66	8,944.61	21,256.00	15,354.37	23,301.68	25,749.38	81,892.34	65,285.49
	Pvt Sec (non-NHDP)			60.00		43.68		142.33		129.49		0.00		375.50
	Total Pvt Sect		7,325.00	7,117.38	13,938.00	8,223.43	16,071.66	9,086.94	21,256.00	15,483.86	23,301.68	25,749.38	81,892.34	65,660.99
	Total Central Roads Sector		21,855.00	19,763.04	31,308.00	23,203.56	36,269.66	24,050.91	46,411.00	35,384.16	60,401.68	55,675.86	1,96,195.34	1,58,077.53

ANNEXURE 15.2

Plan-wise Addition to NH Length

Plan	Length Added (in km)	Total Length (in km)
As on 1 April 1947		21,440
Pre First Plan (1947-51)	815	22,255
First Plan (1951-56)		22,255
Second Plan (1956-61)	1,514	23,769
Third Plan (1961-66)	179	23,948
Interregnum (1966-69)	52	24,000
Fourth Plan (1969-74)	4,819	28,819
Fifth Plan (1974-78)	158	28,977
Interregnum (1978-80)	46	29,023
Sixth Plan (1980-85)	2,687	31,710
Seventh Plan (1985-90)	1,902	33,612
Interregnum (1990-92)	77	33,689
Eighth Plan (1992-97)	609	34,298
Ninth Plan (1997-2002)	23,814	58,112
Tenth Plan (2002-07)	9,008	66,590*
Eleventh Plan (2007-12)	10,228	76,818
Eleventh Plan (2007-12)		
2007-08	164	66,754
2008-09	3,794	70,548
2009-10	386	70,934
2010-11	0	70,934
2011-12	5,884	76,818**

* 530 km length of National Highways of Madhya Pradesh has been de-notified.

** Includes 1,388 km under notification at present

ANNEXURE 15.3

Achievement on National Highways

Period	Total Length# (km)	Widening to Two Lanes (km)	Widening to Four Lanes (km)	Strengthening of Pavement (km)	Major Bridges (Nos)
1947-69	24,000	14,000*	Nil	Nil	169
1969-90	33,612	16,000	267	9,000	302
1990-2002	58,112	3,457	1,276	7,000	87
Tenth Plan (2002-07)	66,590	4,177	6,769**	8,377	611***
Eleventh Plan (2007-12)	75,430	4,892	10,165	4,417	121
Total	75,430	42,526	18,477	28,794	1,290

Note: # Length at the end of the period.

* Includes 6,000 km which were already two-lane at the time of designation as NHs.

** Includes 216.62 km which have been six or eight laned up to Tenth plan.

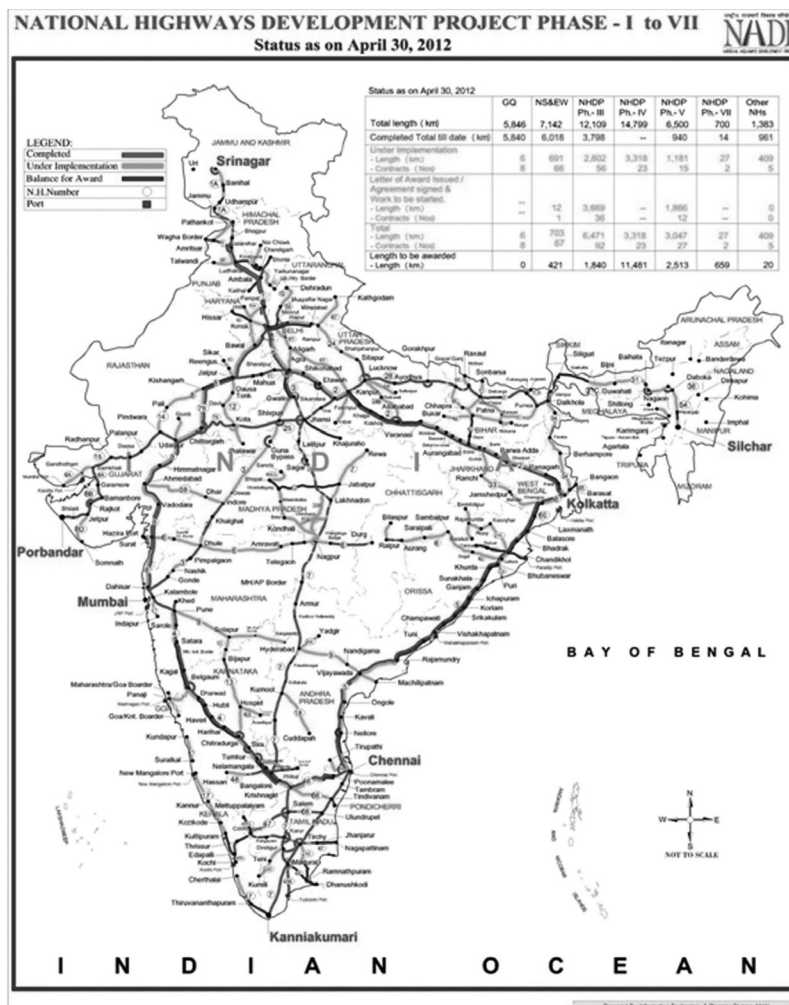
NHAI AND MORTH

BRDB

S. No.	Schemes/Programmes	Physical Performance Eleventh Plan	
		Targets	Achievements
1	Widening to two-lanes (km)	5,603	5,161
2	Widening to four-lanes (km)	14,975	10,947
3	Strengthening of weak two-lanes (km)	4,634	4,625
4	Bypasses (nos)	99	29
5	Major bridges /minor bridges including ROBs (nos)	660	483
6	IRQP (km)	9,441	11,831

S. No.	Schemes/Programmes (Normal NH Works)	Physical Performance Eleventh Plan	
		Targets	Achievements (Up to Jan 2012)
1	Widening to two-lanes (km)	1,111	915
2	Widening to four-lanes (km)	6	3
3	Strengthening of weak two-lanes (km)	135	133
4	Bypasses (nos)	18	6
5	Major bridges /minor bridges including ROBs (nos)	188	127
6	IRQP	911	811

ANNEXURE 15.4



ANNEXURE 15.5

Physical Performance of Air India Limited during Eleventh Plan Period

Particulars	Eleventh Plan	2007-08		2008-09		2009-10		2010-11		2011-12	
	Targets	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.
1	2	3	4	5	6	7	8	9	10	11	12
Available TonneKms (mill.)	54,114	7,180	6,168	8,474	5,602	10,927	6,053	12,811	6,365	14,722	6,482
Revenue TonneKms (mill.)	38,217	5,160	3,688	6,169	3,191	7,782	3,533	8,921	3,726	10,185	3,620
Overall Load Factor (per cent)	71	72	60	73	57	71	58	70	58	69	56
Available Seats km (mill.)	3,74,639	53,411	48,393	61,072	43,591	75,534	44,723	86,230	45,845	98,392	45,803
Rev. Passengers km (mill)	2,74,075	38,795	30,891	44,691	25,950	55,529	28,965	63,252	30,556	71,808	31,456
Passenger Load Factor (per cent)	73	73	64	73	60	74	65	73	67	73	69

Source: Air India Limited.

Note: Ach. – Achievement

ANNEXURE 15.6

Financial Performance of Air India Ltd. during the Eleventh Plan Period

Particulars	Eleventh Plan	2007-08		2008-09		2009-10		2010-11		2011-12	
	Targets	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.
1	2	3	4	5	6	7	8	9	10	11	12
Total Revenue	1,13,367	16,541	15,257	19,096	13,479	23,050	13,485	25,682	14,166	28,998	15,383
Total Expenses	1,11,926	16,423	18,556	18,926	20,668	22,839	19,036	25,345	21,160	28,393	23,237
Profit/(Loss) After Tax	1,441	118	(2,226)	170	(5,548)	211	(5,552)	336	(6,994)	605	(7,854)

Source: Air India Limited.

Note: Ach. – Achievement

ANNEXURE 15.7

Financial Performance of Airports Authority of India during Eleventh Plan Period

Particulars	Eleventh Plan	2007-08		2008-09		2009-10		2010-11		2011-12	
	Targets	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.
1	2	3	4	5	6	7	8	9	10	11	12
Total Revenue	23,783	3,425	4,289	4,117	4,186	4,045	4,615	4,919	5,139	5,382	5,878.66
Total Expenses	14,419	2,187	2,550	2,715	3,070	3,161	3,387	3,758	3,793	4,030	4,514.53
Profit/(Loss) before Tax											
Profit/(Loss) after Tax	5,150	743	1,082	842	687	530	712	720	846	810	859.01

Note: Ach. – Achievement

ANNEXURE 15.8

Financial Performance of Pawan Hans Helicopters Ltd. during Eleventh Plan Period

Particulars	Eleventh Plan	2007-08		2008-09		2009-10		2010-11		2011-12	
	Targets	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.	Targets	Ach.
1	2	3	4	5	6	7	8	9	10	11	12
Total Revenue	1,810	243	243	239	329	311	396	364	424	446	438.15
Total Expenses	1,602	219	214	226	291	283	349	334	384	419	437.05
Profit/(Loss) after Tax	210	22	23	14	25	20	36	20	9	2	(10.35)

Note: Ach. – Achievement

NOTES

1. Clive Bell (2012), 'The Benefits of India's Rural Roads Program in the Spheres of Goods, Education and Health- Joint Estimation and Decomposition', World Bank Policy Research Working Paper 6169, August 2012.
2. Clive Bell and Susanne van Dillen (2012), 'How Does India's Rural Roads Program Affect the Grassroots? Findings from a Survey in Orissa', World Bank Policy Research Working Paper 6167, August 2012.

16

Communication

INTRODUCTION

16.1. Democratisation of information makes it possible for ideas, opinions, knowledge and education to be accessible to everyone, anywhere, anytime. This is the key to innovation and empowerment of citizens. In order to enhance access to information emphasis is laid on building platforms that can leverage broadband and create public information infrastructure and move towards the next generation of governance to ensure accountability, transparency, information sharing and collaboration. The key challenge now is to build and integrate national platforms for the Unique Identification (UID-AADHAR), Geographical Information System (GIS), Cyber Security and Payment Gateway. Finally, leveraging the Fourth Screen i.e., the Mobile Phone for reaching out to citizens is desirable, as it allows a much wider reach and in a language people can understand.

16.2. The ICT sector is predominantly a service sector and has redefined service delivery and the way business houses and common man interact with Government. Rapid technological developments over the years have made it possible to provide services on a single platform due to convergence. During the Twelfth Plan period, this sector is poised for substantial growth both in terms of expansion of carriage (networks) and content (voice, data and multimedia). Since, ICT infrastructure and services encompasses all sectors of economy, the next five years offer a unique opportunity to leverage upon our strength in all facets of ICT. This chapter deals with the Telecommunications, Information Technology, Postal and Information and Broadcasting sectors.

TELECOMMUNICATIONS

Overview

16.3. The telecommunications sector has witnessed phenomenal growth during the last decade. Growth of mobile telephony has been the most visible indicator and catalyst to economic growth. Coverage in terms of number of subscribers has reached 951.34 million in March 2012. The most encouraging feature has been the growth in coverage and increase in the number of subscribers in rural areas powered by low tariffs. More than 5,55,000 villages out of more than 6,00,000 villages in the country have the benefit of mobile coverage and the remaining villages are likely to be covered very soon, either by the Telecom Service Providers (TSPs) on their own, or with support from the Universal Service Obligation Fund (USOF). A worrying feature, however, has been the slow growth in broadband penetration and usage. Broadband subscription was only about 14 million in March 2012, much below what is needed.

16.4. The growth of world-class telecommunication infrastructure in the country has been driven by proactive policy initiatives. The National Telecom Policy (NTP)-1999 recognised that access to telecommunications is of utmost importance for achieving the social and economic goals and help in addressing the developmental challenges of the country. Availability of affordable and effective communications for the citizens was at the core of the vision and goal of the policy makers. Another important objective was to provide a balance between the provision of universal service to all uncovered areas, including the rural

areas, and the provision of high-level services capable of meeting the needs of the country's economy.

16.5. The sector has shown great resilience during a period of global downturn and has registered an annual growth rate of more than 35 per cent during 2008–11. However, the growth has been predominantly propelled through voice based services. The Twelfth Plan period needs to leverage the new technological developments in the sector and provide affordable value added services.

16.6. Important gains have been made in the R&D sector and India is being seen as the global destination for R&D, engineering design and prototype development, as well as a manufacturing hub for high tech products. Generation of Intellectual Property (IP) and products has, however, been limited, even though there are numerous instances of IP and products being registered outside India where the bulk of R&D has been carried out in India. Now the aim must be to translate resident R&D capability into products, patents and IPRs that drive the next generation of technology innovation. The need to channelise the capability that exists in the academia into applied R&D for the Telecom sector cannot be overemphasised.

REVIEW OF THE ELEVENTH PLAN (2007–12)

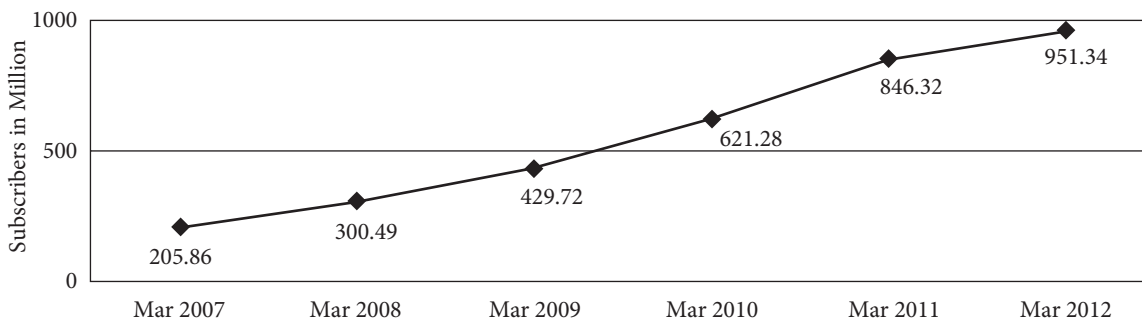
16.7. The Eleventh Five Year Plan saw an impressive four and half fold increase in total telephone connections from 205.86 million in March 2007 to 951.34 million in March 2012 (Figure 16.1). The Eleventh Plan had envisaged a target of 600 million

connections by March 2012. However, during 2009–10 the total telephone connections had already increased to 621.25 million.

16.8. The overall teledensity has also increased from 18.31 per cent to 78.66 per cent during the Eleventh Plan period. However, the subscriber base for telecom services in India is skewed in favour of urban areas. Urban teledensity is around 4.4 times that of rural teledensity (Figure 16.2).

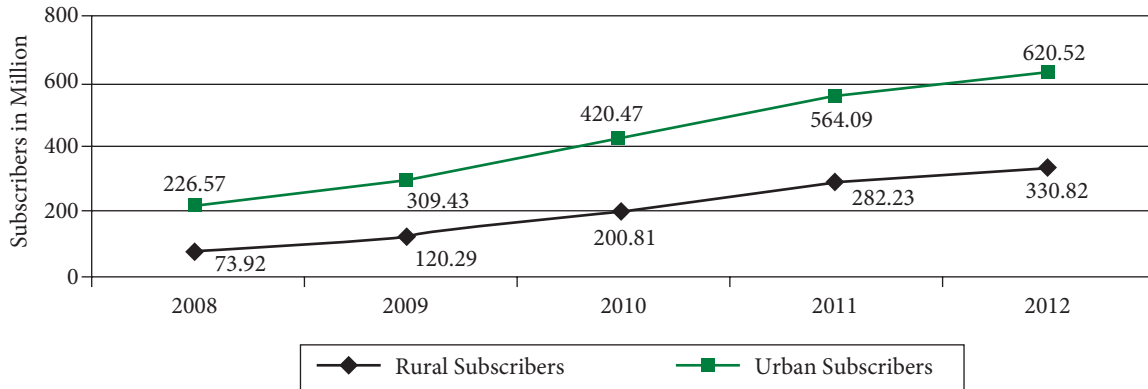
16.9. The sector has been dominated by a preference for wireless phones, as confirmed from the rising share of wireless phones, which increased from 80.19 per cent (165.09 million) in March 2007 to 96.62 per cent (919.17 million) in March 2012. On the other hand, there had been continuous decline in the number of wireline telephones in the country from 40.77 million in March 2007 to 32.17 million in March 2012 (Figure 16.3). The service providers need to leverage the wireline infrastructure, and build services in new and innovative segments, to address this decline and salvage the investments made so far.

16.10. While the wireless led penetration appears impressive, it is dominated by private sector players and voice telephony services. The mobile broadband services also need to keep pace with the voice telephony growth with the launch of 3G/BWA services. The growth of the economy is highly dependent on data services as opposed to voice telephony. Therefore, a significant challenge remains in making the Indian telecom infrastructure accessible and responsive to this basic requirement.



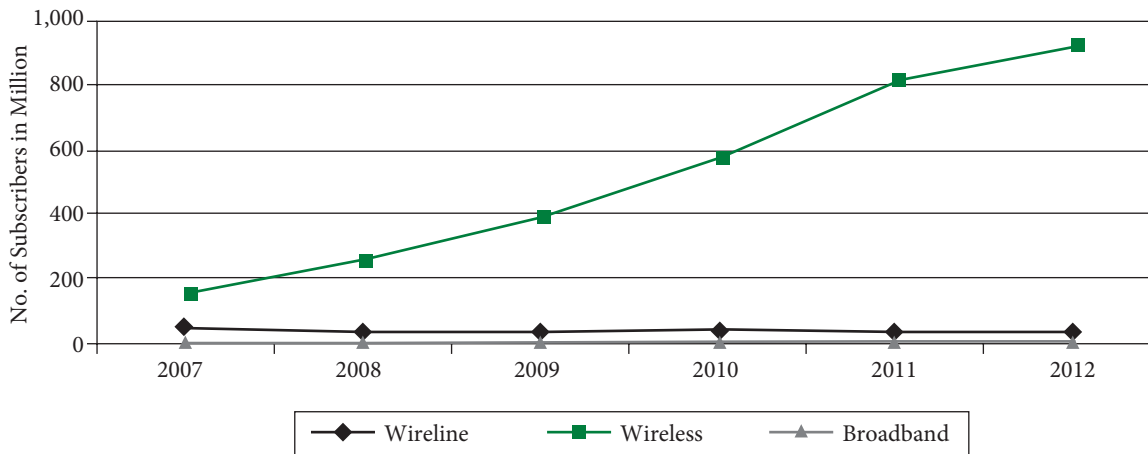
Source: TRAI.

FIGURE 16.1: Telephone Subscribers Growth during 2007–12



Source: TRAI.

FIGURE 16.2: Distribution of Urban and Rural Subscribers



Source: TRAI.

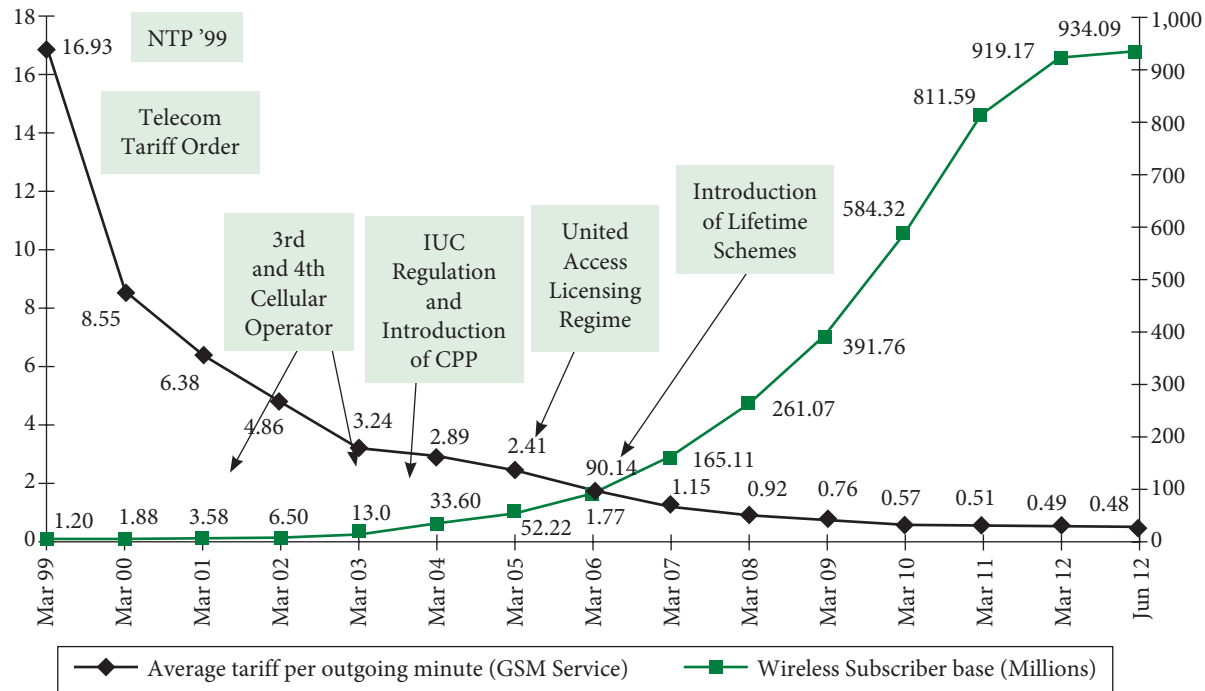
FIGURE 16.3: Number of Telephone and Broadband Connections

16.11. The first wave of initiatives leading to tariff reduction started with the introduction of the Telecom Tariff Order in 2000 bringing down call charges to 50 per cent and the introduction of the 3rd and 4th cellular operator. The ‘Calling Party Pays’ regime further brought down call charges. During the Eleventh Plan period, further steps were taken to encourage competition. These include reduction in tariff for national roaming services; abolition of Access Deficit Charges (ADC); reduction of interconnect usage charges and country wide mobile number portability. These led to a huge boost to the subscriber base and the average tariff also came down sharply. Falling tariffs coupled with the increased number of mobile subscribers, resulted in increase in overall industry revenues. The sector is characterized by high subscriber base and

low average tariff per outgoing call as indicated in Figure 16.4.

Auction of 3G and BWA Spectrum

16.12. The unprecedented growth of voice based mobile telephony in the country has led to demand for other value added services that include data communication, video, mobile TV and so on. With a view to extend the benefit of new technology and for providing a variety of services to the customers, the government decided to introduce the Third Generation (3G) systems, which represent the next step in the evolution of mobile cellular communication. 2G systems focus on voice communication, while 3G systems support increased data communication. Subsequently, the auction of 3G and BWA Spectrum was successfully conducted in 2010 and garnered



Source: TRAI.

FIGURE 16.4: Mobile Tariff Trends V/s Growth in Mobile Subscribers in India (1999–2012)

₹1,06,262 crore. Now, the operators have started rolling out wireless broadband networks in the country and very soon these services are likely to be available in the entire country.

Controversies Arising Out of Decisions Taken in 2008 and Its Fallout

16.13. The policy measures taken so far have paid rich dividends in terms of expansion and provision of affordable telecom services. However, problems arose in the implementation of the First Come First Served (FCFS) policy framework in 2008. These led to a legal challenge, and subsequently, in 2012, quashing of 122 licences by the Supreme Court and a direction by the Court that the Spectrum thus released be auctioned. This is being done. With the completion of the auction in the later months of 2012 it is hoped that there will be a revival of investment in this important sector.

16.14. During this period, the downturn in the economy coupled with the financial stress being faced in the sector, dampened the growth potential of the sector. The unprecedented expansion during the initial phase (1994–2003) followed by years of optimism in

an environment of increasing competition and more choices in technology and services to consumers had led the industry into an ambitious asset acquisition mode. The over-leveraging has, partly on account of the exuberant bidding for 3G spectrum in the auction held in 2010, led to a downward pressure on revenues and earning capacities. The cut throat price competition for adding customers, without adequate emphasis on provision of value added services, have further decelerated the industry’s growth and put a brake on plans for network expansion as well as provisioning for new services.

TELECOM EQUIPMENT MANUFACTURING, R&D, PRODUCT DEVELOPMENT AND IPR

16.15. The Indian telecommunication industry has now matured and has started venturing outside the country and investing abroad. However, the telecom manufacturing in India is yet to attract investment on a sustained basis. During the Eleventh Plan period, it was projected that 75 per cent of telecom equipment demand would be met from indigenous sources; however the actual production was much lower. During this period, mobile handset manufacturing began, but the production as well as value addition

has been limited. Some of the indigenous brands of mobile phones have also made their mark, though their design and manufacturing are still being done outside India. A number of world renowned manufacturers have set up their manufacturing base in the country. There is concern about low value addition, lack of R&D and IPR, availability of integrated circuits, components/piece-parts in the country. Some indigenous R&D and manufacturing companies have emerged in the country and demonstrated that world-class products can indeed be developed indigenously. At the same time, some key IPRs have been created in futuristic wireless technologies by R&D centers such as Centre for Excellence in Wireless Technology (CeWiT) and premier academic institutions such as IITs, IISc, IIITs. It is critical to develop an ecosystem that maintains a sustainable supply chain from thought to action; from ideas to products; from development to production and actual deployment to achieve higher value addition.

THE TWELFTH FIVE YEAR PLAN (2012–17): CHALLENGES AHEAD

16.16. The sector stands at the cross roads of opportunities as well as challenges at the beginning of the Twelfth Plan. On the one hand, recent developments in the sector arising out of aberrations in the licensing and policy implementation have provided an opportunity for introspection. On the other, there is a need to sustain the growth momentum in the sector achieved during the Eleventh Plan to realise the objective of inclusive growth. The National Telecom Policy-2012 has been adopted against this backdrop to address all the key challenges before the sector in a holistic manner. NTP-2012 seeks to achieve Broadband on Demand and envisages leveraging telecom infrastructure to enable all citizens and businesses, both in rural and urban areas, to participate in the Internet and web economy thereby, ensuring equitable and inclusive development. The objective is to transform the country into an empowered and inclusive knowledge-based society, using telecommunications as a platform. It provides the enabling framework for enhancing India's competitiveness in all spheres of the economy. NTP-2012 envisions support to platform neutral services in e-governance and m-governance in key social sectors such as health, education and agriculture that are at present limited

to a few organisations in isolated pockets. In order to achieve the objectives laid down in the NTP 2012, we need to address certain critical constraints and challenges. Some of these are discussed below.

16.17. Expansion of Reach—Broadband Services:

A key thrust area is to connect all villages with population more than 500 on National Optical Fiber Network (NOFN) to realise the vision of 'Broadband on Demand'. Similarly, ensuring sufficient allocation of resources like spectrum, 'Right of Way' management and infrastructure sharing for broadband is essential. There is a need for national level effort to harmonise the policies of various state governments/local bodies to address issues relating to allocation of land, power supply, grant of right of way and policy/by-laws for erection of towers and so on. In addition, there is a need to provide incentives to encourage the uptake of broadband in sectors like education, health-care, public safety, government operations, and so on.

16.18. Rollout of 3G/4G: Though the 3G spectrum was acquired by the Telecom Service Providers (TSPs) during 2010, the rollout of 3G services is yet to reach out across the country at affordable rates. This has affected the introduction of value added services requiring higher bandwidth. India being a price sensitive market, one of the main reasons for poor rollout of 3G/4G services is the high cost of smart phones. There is an urgent need to encourage technologies and R&D initiatives to pave way for the introduction of cost effective smart phones for expanding penetration and out-reach. Provision of funding and support to encourage the rollout of mobile broadband on 3G/4G/LTE/BWA spectrum in rural and remote areas will be crucial for broadband expansion.

16.19. The fulcrum in the sector is the issues surrounding spectrum, its availability, management and pricing. Telecommunications is characterised by rapid changes in technology and introduction of new technologies like Long Term Evolution (LTE), high bandwidth applications and the demands of an ever increasing user base requiring additions to the spectrum available for non-strategic uses. Since spectrum is a scarce resource, priority will be on its vacation from lesser efficient uses and shift to more efficient use. This will involve intensive policy intervention

to have Government agencies like the Defence and Railways vacate spectrum bands and reforms in spectrum management practices. It has already been decided to allow a liberalised use of spectrum in any band for any technology. In addition sharing spectrum and thereby pooling resources and eventually move towards a regime that permits spectrum trading on a trading platform and creating a market driven mechanism towards its efficient use. Box 16.1 gives the historical perspective of spectrum trading.

Box 16.1 Spectrum Trading

Historically, in most countries, the Regulator has used a command and control mechanism to decide allocation of spectrum. But in the last decade, a number of countries have adopted market mechanisms for spectrum assignment. However, it is being increasingly felt that this system does not allow the spectrum licence holders the flexibility to respond quickly to changes in market demand and technology, resulting in chunks of spectrum lying underutilised, thereby creating an artificial scarcity. Therefore, some countries like Australia, Canada, New Zealand, and some EU countries have permitted spectrum trading in the secondary market as an additional means of spectrum distribution. This is likely to improve spectrum efficiency, boost market competition and provide incentives to innovation to service providers. On the other hand it could lead to situations wherein service providers of less profitable services would prefer to sell their spectrum instead of continuing to provide services and which may increase the risk of possibility of concentration of spectrum and market power. Spectrum Trading requires implementation of a successful trading platform in the form of a secondary market requiring creation of an extensive automated infrastructure in the form of an exchange/online registry which entails considerable regulatory costs.

16.20. Consolidation in Industry: Presently, there are six or more TSPs in most of the service areas and are grappling with reduced ARPUs and high competitive pressures. The future development of cellular markets is likely to witness consolidation between the Service Providers to become financially viable. The revised TRAI recommendations with the relaxation of M&A norms are expected to act as enablers for further consolidation in the telecom industry.

16.21. Financial Health of the Sector: The aggressive bidding in 3G/BWA spectrum auction held in 2010 left the industry financially weak. In addition, expansion into overseas markets, coupled with the

global meltdown and non-availability of funds has restricted the industry's expansion plans. This to a large extent has decelerated network expansion as well as introduction of new technologies such as 4G/LTE and value added services.

16.22. Licensing Reforms: For facilitating orderly growth of the telecom sector, steps such as introduction of Unified Licensing regime, de-linking license and spectrum, license renewal terms, technology neutrality, rationalisation of licensing regime and enabling convergence need to be taken on priority basis. In addition, there is a need to encourage deployment of Low Power In-Building Solutions (IBS)/In-Campus/Remote Townships and so on, in tune with the provisions contained in NFAP 2011 and NTP 2012 through de-licensing of small chunks of spectrum.

16.23. Regulatory Issues: TRAI was established in 1997 after the sector was thrown open to private players. Since then there has been far reaching changes including number of operators, subscriber base and range of services being offered. There is a need to revisit the TRAI Act and revise its provisions to address the emerging issues. There is also a need to review the regulatory and executive functions for instance, the Department of Telecommunication is involved in activities which are mandatory in nature such as spectrum allocation, management, auditing and monitoring. For effective and transparent Spectrum allocation and management and to facilitate better coordination amongst various government and non-government agencies, the National Radio Regulatory Authority namely, the Wireless Planning and Coordination (WPC) wing of DOT, needs to be repositioned with greater autonomy and fuller authority.

16.24. Network Security: With rapid expansion of telecom and IT networks and increased dependence on the networks for delivery of services and operation of physical and financial infrastructures has given rise to security concerns. There is an absolute necessity to ensure security of networks at all times and adopt effective measures to deal with cyber threats. For ensuring telecom network security there is a need to strengthen the Centre for Communication Security Research and Monitoring and Telecom Testing and Security Certification

Centre. Similarly, developing and deploying a Pan India secure network and network-based services such as email, VoIP, mobile communication through survivable and available network architecture for Government use is also essential.

16.25. Convergence: Convergence of technologies has thrown open many new challenges and opportunities. This calls for establishment of a proactive and suitable regulatory framework which would address issues related to both content and carriage, there by leading to eventual convergence of IT, Broadcasting and Telecom.

16.26. Future of PSUs: The poor health of the PSUs under DOT is a matter of concern. The Department has under its administration control, not only MTNL and BSNL, but also the Indian Telephone Industries (ITI) and Telecom Consultants of India Ltd. (TCIL). Urgent steps are required to be taken to turn them around by leveraging upon their strengths and assets as well as financial reengineering. For ensuring DOT organisations to effectively flourish in the competitive telecom market there is a need to exploit individual strengths of these organisations for their mutual benefit. Efforts should be made by all the PSUs to reduce their dependence on government support and become competitive by shedding obsolete technological and non-profitable product lines and moving on to more remunerative activities and services. There is also a need to look for newer markets and alliances. Government support should be restricted only for initiatives which address and meet the social obligations of the government and in areas where the market is not fully developed.

16.27. Issues of Transition: The telecom sector faces rapid technological change and concomitantly issues relating to transition to new technologies and obsolescence. The phasing out of technologies where eco-systems are dying, has attendant economic difficulties. There is therefore, a compelling need for ensuring minimum quantum of spectrum allocation for effective harnessing of technology and paving the way for the entry of new technologies, calling for an appropriate policy response which helps in the adoption of new technologies and creating appropriate eco systems for ensuring a smooth transition.

Box 16.2 Twelfth Plan Targets for the Telecommunication Sector

- Provision of 1,200 million connections by 2017.
- Mobile access to all villages and increase rural tele-density to 70 per cent by 2017.
- Broadband connection of 175 million by 2017.
- Commissioning of National Optical Fibre Network (NOFN)
- Make available additional 300 MHz of spectrum for IMT services
- Making India a hub for telecom equipment manufacturing by incentivising domestic manufacturers with thrust on IPR, product development and commercialisation.
- Provide preferential market access for indigenously manufactured products.
- To increase domestic manufactured products in telecom network to the extent of 60 per cent with value addition of 45 per cent by 2017.
- Adoption of green policy in Telecom and incentivise use of renewable energy sources.

THE PATH AHEAD

16.28. The Twelfth Plan Programmes for the telecom sector are guided by the NTP-2012. The thrust of NTP 2012 is on raising the competitiveness of Indian telecom sector, to make it a world leader, while at the same time making available a variety of services on a single platform utilising the technological advancements taking place in the sector. Spectrum, which is an important input has been a limited and reusable resource. With the introduction of new technologies, high bandwidth applications and increasing user base, there will be a requirement of significant amount of additional spectrum. While effective spectrum planning in this regard needs to be carried out, the requirement of spectrum in 60 GHz and above bands for backhaul purposes, audit of spectrum usage and re-farming of spectrum to ensure the efficient utilisation should also be taken into account during the Twelfth Plan Period. Twelfth Plan targets for Telecommunication Sector is given in Box 16.2.

16.29. In view of the situation analysis and the identified needs of the key stakeholders, the following approach is suggested for Twelfth Plan period.

- (a) **USOF Activities:** USO fund needs to be leveraged for providing incentives for pilot projects,

fixed wireline/wireless phones, use of renewable energy sources, telecom infrastructure and for wireline broadband in rural difficult terrain and LWE areas.

- (b) **Applications, Value Added Services (VAS) and Devices:** Development of new applications, VAS and devices would be triggered by e-Governance projects and growth of Broadband in Rural Areas. Developing synergies between DoT, DeitY and I&B to tap the Cable TV segment for proliferation of broadband and broadband access to all schools for promoting literacy through e-learning programs will also propel the introduction of VAS and development of low cost devices.
- (c) **Telecom Equipment Manufacturing:** The large and growing domestic market for telecom equipment provides an opportunity to leverage this potential to stimulate domestic manufacturing without financial impact to the government. Provision has been made to require India manufactured products in procurement by the government and also in projects funded by government or under Universal Service Obligation. The preference is for products which have a specified domestic manufactured content and the requirement is only of manufacture/value addition in India. Foreign companies manufacturing in India would be eligible. Telecom Operators also need to be encouraged to participate in trials of newly created Indian products and nurture them. Funding R&D and supporting Indian IPR creation and driving standards are equally important aspects of the promotion of the telecom equipment manufacturing. Creation of National Investment and Manufacturing Zones (NIMZs) as proposed by DIPP and incentivising manufacturers in line with Modified Special Incentive Programme scheme (MSIPs) and Electronic Design and Manufacturing Cluster (EDMC) of DeitY are other initiatives that need to be taken forward for the growth of telecom equipment manufacturing in India. Setting up of Mega Fabrication Units (FAB) facility for the manufacture of Integrated Circuits (IC), Development of Hardware Manufacturing Cluster Parks (HMCPs), Stable fiscal policies, tax structure that encourages manufacturing, Market pull for domestic manufacturers, R&D facilities, access

to low cost funds, testing and certification and so on, also need to be taken up to make India a telecom equipment manufacturing hub.

- (d) **R&D, IPR and Standardisation:** There is a need to create a mechanism for Technology and Product development forecast and to carryout periodic updates of the national five year rolling programme of technology/product development and its field absorption. The current functioning and strengthening of public R&D institutions such as C-DOT also needs to be reviewed to enable them to collaborate with public as well as private industry and academia for technology development. In order to enable creation of IPRs and progressively mature them into standards, Telecom Standards Development Organisation (TSDO) may be established with participation from industry, telecom service providers, academia, R&D centres and government. Academic R&D, R&D centres and Telecom Centre of Excellence (TCoEs) need to be repositioned towards IPR generation and creation of telecom standards, development and commercialisation of Indian Products. Some of the other major initiatives include Strengthening Telecom Engineering Center; setting up of accredited test facilities for conformance, performance, inter-operability and security of the products; creation of live test-beds for Next Generation technologies; reserving certain spectrum for indigenous R&D, product development and field trials (pilots); developing safety and aesthetic standards for wireless towers; and ensuring compliance against existing Electromagnetic (EM) emission standards.
- (e) **Disaster Management:** A Rapidly Deployable Multi-Protocol Wireless Communication system, interoperable across all the services engaged in disaster management needs to be developed. A dedicated communication link needs to be given to disaster management agencies by every service provider to receive guaranteed service during disasters.
- (f) **Capacity Building in Telecom Sector:** For evolving a strategy for capacity building in telecom sector there is a need for a comprehensive repository of all telecom related information/standards/benchmarks/resources/programme curriculum, besides setting up of state-of-the-art

telecom labs in all high-end technology areas and inclusion of Electronics and Telecom as part of the curriculum at the polytechnic level and in Industrial Training Institutes for trades specific to telecom.

- (g) **Financing of Telecom Sector:** The sector should be allowed to access funding from Indian Infrastructure Finance Company Ltd. (IIFCL). Telecom Finance Corporation may be created as a vehicle to access funds at competitive rates to facilitate the funding needs of this sector on requirement. Rationalisation of levies and taxes in the sector may also be reviewed from time to time to ensure affordable delivery of services to the consumers.
- (h) Besides the above, several new programmes like Telecom Promotion Fund, Telecom Entrepreneurship Promotion Fund, Research Development Fund and Human Resource Development and Skill Development are proposed to be taken up during the Twelfth Five Year Plan. C-DOT would take programmes on Next Generation Mobile Technology, R&D for emerging Wireless Technologies; Optical Technologies—XGPON-1/2, WDM-PON, DWDM; Development for a Secure Mobile Communication Network namely WiPS based GSM technologies like EDGE and 3G, BWA; Satellite based Technology; R&D for converged NMS, Software intensive Applications for new services, service delivery platform to support multiple applications and Value Added Services; Power efficient and Green Technologies for Rural areas and Next Generation security for Telecom and Data Networks. Major Investment would be required during the Twelfth Five Year Plan in the area of network expansion in the rural and remote areas, network upgradation in customer demand cycles, 3G subscriber base, NGN and IPV6, rural telephony, broadband expansion, National Optical Fiber Network (NOFN), convergence of technology, Value Added Services and manufacturing and R&D.

INFORMATION TECHNOLOGY

Overview of the Sector

16.30. The Information Technology sector has made remarkable progress in the last decade. It has

transformed the world, enabling innovation and enhancing productivity, connecting people and communities, and improving standards of living and providing opportunities across the globe. While changing the way individuals live, interact, and work, IT has also proven to be a key enabler for enhanced competitiveness and economic and societal modernisation, as well as an important instrument for bridging economic and social divides and reducing poverty.

16.31. The pace of technological advance is accelerating and Electronics and ICT is increasingly becoming a ubiquitous and intrinsic part of people's behaviours and social networks as well as of business practices and government activities and service provision. These transformations will continue to guide human progress forward by further leveraging IT's positive social, political, and economic impact on government, enterprise, and civil society alike.

Review of Eleventh Plan

16.32. The following five thrust areas were identified for the Eleventh Five Year Plan:

- Electronics/IT Hardware Manufacturing
- Exports of Computer Software and Services
- Domestic Computer Software and Services
- Enhancing Cyber Security Capabilities
- Human Resource Development and R&D

16.33. The key targets and achievements with respect to Electronics/IT Hardware Manufacturing, Exports of Computer Software and Services and employment are given in Box 16.3 and Table 16.1.

Broad Objectives, Targets and Thrust Areas for the Twelfth Five Year Plan

16.34. The vision and mission for Electronics and IT Sector for the Twelfth Five Year Plan is e-Development of India through a multi-pronged strategy. This includes promotion of e-Infrastructure creation to facilitate and fast track e-governance, promotion of software (IT-ITeS) Industry, building knowledge network and securing India's cyber space. While India's software strengths are recognised globally, we have not focused on building indigenous hardware, research and manufacturing capabilities. The

Box 16.3
Key Achievements (as on 31 March 2012)

E-Governance

- SWANs rolled out in 30 States/UTs.
- 1,00,086 Common Services Centres rolled out in 33 States/UTs.
- 16 State Data Centres are operational.
- The National Data Centres at Delhi, Pune and Hyderabad are operational.

National Knowledge Network

- 681 links to institutions commissioned and made operational.
- 52 virtual classrooms set up.

Enterprise

- Open Source Software (BOSS) released.
- Param 'Yuva' Super computing system commissioned.

E-Security

- The Information Technology (Amendment) Act, 2008 enforced and rules of important sections notified.
- Security Assurance frame work for Govt. developed and validated in Customs Department.
- Resource Centre for Cyber Forensics established.
- CERT-In operates a 24 × 7 Incident Response Help Desk.

Empowerment

- Software tools and fonts for all 22 constitutionally recognised Indian languages released in public domain.
- Various IT projects initiated for empowerment of gender and SC/ST and development of North Eastern region.

Draft National Policy on Electronics—2011 and Draft National Policy on Information Technology, 2011 released.

Policy for Preference to Domestically Manufactured Electronic Goods issued on 10 February 2012.

TABLE 16.1
Targets and Achievements

Targets	Achievements (Estimated) upto 2011–12	Percentage Achievement (%)
Electronics Hardware		
• Electronics production—US\$ 67 Billion @ 32 per cent growth	US\$ 33.0 Billion	49
• Exports—US\$ 6.7 Billion	US\$ 7 Billion	104
Software Services		
IT-ITES Exports—US\$ 86 Billion	US\$ 69 Billion	80
Employment		
• Direct Employment in IT-ITES Exports—3.4 Million	2.8 Million	82

Electronics and ICT strategy for the Twelfth Plan should aim to focus on promoting domestic manufacturing, including hardware design, building Semiconductor Wafer Fab manufacturing facilities and strengthening R&D capabilities.

16.35. Appropriate application of ICT has the potential to vastly improve productivity and efficiency.

Therefore, there is a need to promote the use of ICT platforms and convergence of technologies to ensure better delivery of public services, increased efficiency in the implementation of the Government's flagship programmes and the overall competitiveness of the economy, since ICT applications will have a pervasive effect on the resilience and dynamism of all sectors of the economy.

16.36. India is home to millions of persons with disabilities who are living on the fringes of society due to their inability to participate in the information age. There is a need to redefine important areas for intervention with emphasis on improving the accessibility of ICT to the differently-abled people of the society as well as promoting its use as an assistive technology to improve their quality of life.

16.37. In order to achieve the objectives of the Twelfth Five Year Plan, the following themes have been identified:

- e-Government
- e-Learning
- e-Security
- e-Industry (Electronics System Design and Manufacturing)
- e-Industry (IT-ITeS)
- e-Innovation/R&D
- e-Inclusion

16.38. The overall strategy for the sector is to plan action/programmes/projects for each of these themes in the Twelfth Five Year Plan, with innovation and inclusion as the fundamental paradigm in each one of them. The Sub-strategies under each of

these areas have been designed to address suitably the major challenges facing the sector in the next five years. The key targets for the Twelfth Plan for the Electronics and IT-ITeS Industry are given in Table 16.2.

Policy Issues, Programme Reforms and New Initiatives in the Twelfth Plan

16.39. Some of the Policy issues and new initiatives proposed in the Twelfth Five Year Plan are given below:

Policy Issues

- Several new policies have been approved by Government relating to promotion and development of the ESDM sector. A Governance mechanism which would ensure that the benefit of these and other policies envisaged for the sector reach the targets in a speedy, fair and transparent manner also needs to be developed. Necessary policy to mandate standards in electronic goods also need to be put in place. Policies to induce greater participation of private sector in human resource development also need to be ensured.
- Finalisation and implementation of National policies on Electronics and Information Technology, spanning the entire spectrum from science to

TABLE 16.2
Key Targets for the Twelfth Plan for the Electronics and IT-ITeS Industry

(Values in USD Billion)

I. Production and Export Targets (Electronics Hardware)		
A. High Manufacturing Growth Scenario (Optimistic)		
Description	FY 2011–12 (E)	Target FY 2016–17
Exports (Growth Rate: 22 per cent)	7	20
Production (Growth rate 30 per cent)	33	122
B. Natural Manufacturing Growth Scenario		
Exports (Growth Rate: 22 per cent)	7	20
Production (Growth rate 16 per cent)	33	69
II. Revenue and Employment Targets of IT-ITeS Industry		
IT-ITES Exports	69	130
IT-ITES Domestic Revenue	19	40
Direct Employment	2.8 million	4.2 million

(E): Estimated.

technology to products, eventually resulting in mass scale deployment.

- Establish 'National Electronics Mission' to help in synchronised functioning of the industry through effective coordination across ministries and government departments at the Centre and the States.
- Removing barriers of cost, language and accessibility and provide equitable access to Internet and its benefits to all. Formulate and implement a national digitisation plan and a digital information literacy campaign for enabling the common man to use ICT optimally.
- Create a comprehensive national IT standards framework for current and emerging paradigms like bio-metrics, cloud computing, Green IT and so on.
- Formulate specific policies to enable public Cloud Computing for citizens, business verticals and for government.
- Formulation of governing principles for allocation, management and sharing of Critical Internet resources namely Internet Protocol addresses and Domain Names.
- Bring out Best Practices and Public Policy on Internet openness, security and privacy in cyberspace.
- Promote development and deployment of security standard and practices, which are internationally accepted for ensuring a secure cyber space.
- Participate globally in standard setting exercise on Electronics and ICT for business and consumer applications to ensure competitiveness of Indian industry.
- Develop strong capabilities in encryption, forensics and establish test labs for testing products for security and quality; early detection and mitigating capabilities of newer threats and vulnerabilities, which have potential to disrupt the ICT infrastructure.
- Creation of a separate Electronics Development Fund with Govt. and Industry bodies as stakeholders to incentivise R&D in this field.
- Promotion of indigenous R&D and product development coupled with progressive induction into strategic defense and civilian space.

- Develop a holistic approach for funding socially relevant R&D projects in Public Private Partnership (PPP) modes.
- Define 'R&D in Services' specially, R&D in Electronics and ICT Services to make it broad based. The present definition of R&D as accepted by DSIR and Income Tax Department appears weak to accept R&D in Services.
- Initiation of a comprehensive IPR promotion programme covering education, awareness creation, IP exchange, related technology development and support to SMEs and start-ups.
- Revamping the procurement cycle for Electronics and ICT products and services to keep them in tune with the technology obsolescence and shelf life of products. Also there is a need to relook at the 100 per cent pre-dispatch acceptance testing clause.
- Ensure flexibility in policy to support and adopt new and emerging technology paradigms in Electronics and ICT

New Initiatives

- *Modified Special Incentive Package Scheme for improved value addition:* Manufacturing base of electronic products in the country is grossly inadequate in comparison to demand of such goods. Even in cases where products are manufactured in India, the extent of domestic value addition is low. This scheme (M-SIPS) has been introduced to promote large scale manufacturing in the Electronics System Design Manufacturing (ESDM) sector by providing a special incentive package. The incentives would partially offset the disabilities faced by domestic ESDM industry due to factors like higher cost of power, finance, logistics, fragmented location of industry and so on, and thereby reduce the viability gap faced by the manufacturing units in India.
- *Promotion of Electronics Manufacturing Clusters (EMC):* The growth of the Electronics System Design and Manufacturing (ESDM) industry in the country is constrained by infrastructure, power and finance, the three elements of operating environment which needs to be addressed. The scheme envisages financial support for development of EMCs as they are expected to aid the

growth of ESDM sector, help development of entrepreneurial ecosystem, drive innovation and catalyse economic growth. The scheme would support setting up of both Greenfield (in undeveloped/underdeveloped geographical area) and Brownfield EMCs (where a significant number of existing ESDM units are located). The focus is on upgrading infrastructure and providing common facilities for the ESDM units.

- *Semiconductor Fabs*: Semiconductor is at the heart of any electronic system and constitutes at least 25 per cent of the total value. In case of high-end equipment and mobile handsets, this content goes as high as 60 per cent. Presently, while this is imported, in order to enable manufacturing of electronic equipment and also push up the value addition in India, setting up of Semiconductor wafer fab (full scale as well as proto type) is a prerequisite and critical requirement for enhancing domestic manufacturing capabilities in India.
- *Cyber Security R&D and Human Resource Coordination*: The focus would be on supporting and facilitating basic research, technology demonstration, proof of concept and test bed projects in thrust areas of cyber security through sponsored projects at recognised R&D institutions. Proactive and collaborative actions in PPP aimed at cyber security incidents prevention, prediction, response and recovery actions and cyber security assurance will be the cornerstone for the cyber security R&D and human resource coordination.
- *Cyber Security Preparedness*: In order to ensure the cyber security preparedness, an improved interaction and engagement with various key stakeholders such as Govt., critical infrastructure sectors, sectorial CERTs, International CERTs, service providers including ISPs, product and security vendors, security and law enforcement agencies, academia, media, NGOs and cyber user community is essential. Carrying out periodic cyber security mock drills to assess the preparedness of critical sector organisations to resist cyber-attacks and improve the security posture are some other important steps in this regard.
- *Green IT*: Enhanced deployment and usage of Green IT in both computing and non-computing infrastructure (for example, buildings) would be promoted. Procurement policy needs to incorporate guidelines for preference for energy efficient products and to drive Green rating and stricter regulation and implementation of e-waste disposal.
- *Promote E-Governance cloud*: Cloud computing as a technology paradigm has a tremendous potential to reduce cost, implementation timelines and increase reusability. There should be an increased focus on cloud computing as a mainstream delivery model by establishing an 'e-Gov Cloud' which can be accessed by various tiers of government to implement digital public services.
- *Promotion of use of ICT by domestic industry for enhancing productivity in priority sectors like agriculture, health, education, retail, automotive, textile*: With the emergence of country-wide high bandwidth broadband networks, there is a need to build HR centric applications such as virtual labs, country wide virtual classrooms, and so on to ride on these platforms for improving the quality of students, faculty as well as research. There is also a need to continue with the programme on development of suitable technology/products for mass applications in these sectors.
- *Promote development of SMEs in ICT Sector*: The Software Technology Park scheme has played a stellar role in the growth story of the IT-ITeS/BPO sector in the country. To provide competitive edge to small and start-up companies and to attract investments beyond Metro cities (that is Tier II and Tier III cities), there is a need for similar enabling environment.
- *Enhancing Supercomputing Capacity in India*: Supercomputing plays an important role in both scientific advancement and economic competitiveness of a nation. In order to keep pace with supercomputing developments globally, it is important that we focus on building supercomputing systems of different sizes matching with the demands of HPC user applications, Supercomputing applications development, manpower development and R&D for Exascale computing by leveraging the already built HPC capabilities in the country.
- *Citizen Engagement Framework for e-Governance Projects*: As the government is incorporating ICT

into delivery of G2C services, there are hardly any embedded mechanisms to facilitate the voice and space for citizen participation in e-governance. It is with this vision that Citizen Engagement Framework (CEF) for e-Governance projects has been conceptualised. In addition, Social Media Framework for the Government of India has been created to enable government agencies to use blogs, forums and online social networks more effectively and reach out to their stakeholders and understand their concerns and hear their voices.

- *HR Policy Framework for e-Governance*: There is an urgent need not only to augment the HR pool but to create suitable organisational structures with clear roles and responsibilities for implementation of e-Governance projects. To supplement the resource pool within the Government, competencies outside the Government ought to be leveraged and an enabling framework for attracting, retaining and optimally utilising such skilled persons need to be put in place. Setting up of an e-Governance Academy as a Centre of Excellence and think tank in this area is also desirable.

Key Constraints and Challenges

16.40. The sector is facing numerous constraints and challenges. A list of these constraints and challenges theme wise is given below:

- *e-Government*
 - *Business process re-engineering (BPR)*: Implementation of BPR as an integral part of e-government programmes on the national and local levels, especially for those involving the transition to single-window electronic services' delivery based on integration of information systems operated by multiple agencies.
 - Fast tracking of the Mission Mode Projects identified under the National e-Governance Plan for electronic service delivery is a formidable challenge in view of the fact that a number of actors covering central, State and local governments are involved.
- Constraint of internal capacity to manage large e-Governance Projects and resourcing of Skilled, experienced manpower across all stage of Life Cycle.
- *Mobile Governance*: Providing adequate financial and institutional support to various agencies to foster creativity and innovation in developing appropriate applications for mobile based delivery of public services is very important with the involvement of all stakeholders in the supply chain.
- *E-waste management*: IT can be a strong enabler for realising the objectives of India's National Action Plan for Climate Change. Sustainable and environment friendly E-wastage management should be a part of these objectives.
- *Government procurement*: Adoption of standardised RFPs, Model Contracts, developed by DeitY, to reduce procurement cycles.
- *E-Learning*
 - Create and leverage Government e-Learning platform to aid training and skills development of Government Staff, especially end-users at junior level for driving adoption of e-Governance systems.
 - *Natural Language Processing (NLP)* is a complex technology area. Building any language technology product requires large resources. There are very few researchers working in the NLP area and constant efforts are required to expand the team all over India to address requirement of all 22 constitutionally recognised languages. Issues related to e-Pedagogy for content and its delivery on the e platform, establishment of e-classrooms for delivery of e-content and e-learning are very important and the corner stone for the successful implementation of e-learning module.
- *E-Security*
 - *Cyber security*: In addition to land, sea and air, cyber space is a new dimension without any borders affecting each individual. There is increasing evidence of espionage, targeted

attacks and lack of traceability in the cyber world as state and non-state actors are compromising, stealing, changing or destroying information and therefore potentially causing risk to national security, economic growth, public safety and competitiveness. Therefore, it is essential to focus on R&D, Human Resource, Security Standards and Certification and Cyber Security coordination in order to overcome such challenges during the Twelfth Plan.

- *E-Industry (Electronics Hardware and IT-ITeS)*
 - *Competition and strong pull from other countries:* China, Philippines, Vietnam, Poland, Hungary, Mexico, Brazil, Egypt are an indicative list of countries that are emerging as competitive locations for IT-ITeS sector. These are fast increasing to almost 50 locations which presents a huge challenge to India's success story. India's biggest competition in the Electronics Hardware sector is from China, which has achieved high economies of scale and has highly subsidised operating environment which is largely opaque.
 - *Reduced competitiveness of the industry:* India's competitiveness in IT-ITeS Sector is declining due to high cost of doing business due to inefficiencies of power, transport, security, concentration in metros due to inadequate infrastructure in other towns and so on.
 - *'Made in India' procurement:* Indian firms particularly the SME firms who develop products find it difficult to sell to the Government as they lack the sales capacity or they fail to meet the qualifying procurement criteria, for example, annual revenue, number of customer and so on. As a result the 'Made in India' IT products find it difficult to scale up.
 - *Lack of research capacity:* A key weakness of the Indian IT industry including Government agencies is the lack of original technology development. Majority of IT deployed in India is either imported or IPR resides with non-Indian entities. Innovation ecosystems in places like Silicon Valley, which lead in technology development, have demonstrated that

a key lever for technology development is the maturity of the post-graduate and doctoral research programmes. In India, the number of computer science doctoral research programmes is very low—both qualitatively and quantitatively.

- *ITA and the WTO:* Electronics was the first sector to be opened up and which accepted zero duty regime for large number of products. As a signatory to the Information Technology Agreement-1 (ITA-1) of the World Trade Organisation (WTO), India has implemented zero duty regime on 217 product lines. Under the Free Trade Agreements (FTAs) and Preferential Trade Agreements (PTAs) with various countries, the import of electronics hardware from these countries is allowed at a duty which is lower than the normal duty rate.
- *Disability Costs in local Manufacturing:* The three elements of operating environment which pose significant challenges to Indian manufacturers are: infrastructure, power and finance.
- *Lack of support for industry led innovation:* Electronics Sector constituted one of the largest IP wealth in the world. These IPRs have been created by industry competing with each other. However, our efforts have not led to industry led innovation in the sector. During the Twelfth Five Year Plan efforts would be to stimulate provision of risk capital to seed new ideas and startups in Electronics System Design and Manufacturing. An Electronic Development fund is proposed to be set up with industry/financial institutes' participation.

Path Ahead

16.41. Widening of R&D base, promoting R&D for manufacturing and creation/augmentation of R&D infrastructure in the field of Electronics and IT is essential for maintaining the competitive edge.

16.42. The Information, Communication Technology and Electronics (ICTE) has come to be accepted as a key enabler in development and is globally being accepted as a 'Meta-Resource'. The demand for electronics hardware is increasing and demand supply gap is widening. Moreover,

since the value-addition in domestically produced electronic goods is very small. Therefore, there is a need to offset the debility and attract Investments in ESDM Sector by providing suitable incentives to the sector.

16.43. To realise the vision of NEGP, there is a need to reorient the activities for maximising outcome to the citizens. Electronics Delivery of Services (EDS) Act needs to be put in place at the earliest in order to mandate provisioning of all public services compulsorily through electronics means from a specified date. Electronics and ICT are all pervasive today and there is a dire need to synergise with the important initiatives and capabilities in the strategic departments.

INDIA POSTS

Overview of the Sector

16.44. India Posts has been the backbone of India's communication and at the core of the country's social-economic development for the last 150 years. It has touched the lives of every citizen. A network of 1.55 lakh (approx.) Post Offices (POs) in the country with more than 1.39 lakh POs in rural areas is indicative of the commitment of the department towards its customers. The core activity of the department is processing, transmission and delivery of mails. The department has undertaken Mail Network Optimisation Project to improve the quality and efficiency of mail processing, transmission and delivery. Considering the vital need for providing benefits of technology to the customers, the counter operations are now being progressively computerised.

16.45. The Post Office Savings Bank provides financial inclusion to people all over the country through various saving schemes, as its reach and services are unparalleled by any other banking agency in the country. Postal Life Insurance (PLI), one of the oldest life insurance schemes initially meant only for the Postal employees, now caters to employees of the Civil and Military Personnel of the Central and State Governments, local bodies, government aided educational institutions and so on. Following the recommendation of Malhotra Committee on Insurance Sector Reforms, the Department of

Posts (DoP) started the Rural Postal Life Insurance (RPLI) Scheme for insuring the rural populace with special emphasis on women and weaker sections of Society.

16.46. The department is facing twin challenges posed by increasing competition and continuing advances in communication technologies. The department has therefore initiated an end to end IT modernisation project to connect all the 1.55 lakh post offices. The benefits and impact of this IT project will flow into all the Twelfth Five Year Plan schemes and activities and the next five year Plan period will be extensively a period for consolidation and implementation of the IT project.

Review of the Eleventh Five Year Plan

16.47. The Eleventh Five Year Plan witnessed the continued drive of computerisation of the post offices, administrative offices and accounts offices and completion of the supply of hardware to departmental post offices. Establishment of a strong IT base has enabled Department of Posts to provide several value added services, besides providing the platform for anywhere anytime banking. Mail Network Optimisation Project and setting up of Automated Mail Processing Centres were undertaken to improve the quality of mail operations. Postal Life Insurance is being transformed into a commercial business entity with the development and operationalisation of software modules for reporting daily net accretions of POLIF and RPOLIF by Head Post Offices. The Department of Posts has steadily expanded the insurance business during the Eleventh Five Year Plan. As on 31 March 2012, Postal Life Insurance had 5.6 million policies and Rural Postal Life Insurance had 19.63 million policies with a total sum assured of ₹79,183.44 crore and ₹82,540.86 crore respectively.

16.48. The department in last few years has also computerised 24,969 post offices and networked 22,177 post offices (as on 30 June 2012) in urban and rural areas. The department has also taken up Project Arrow for modernisation of post offices, as a part of which, 1,736 post offices have been modernised. India Post, 2012 Project aims to roll out integrated

software for Postal Banking, Postal Life Insurance, e-commerce and retailing. In addition, it will also provide rural ICT solution to more than 1,30,000 POs. With the introduction of 'One India One Rate' scheme, speed Post was expanded to cover more than 1,200 towns. The department has also completed construction of 95 post offices, 13 administrative offices and 15 staff quarters projects, besides organising the 6th World Philatelic Exhibition INDIPEX. Some of the other achievements include introduction of e-Post Office, opening of 1,008 franchisee outlets and providing necessary infrastructural equipment to more than 1 lakh branch post offices (BPOs).

Mails (Including International Mails and Global Business)

16.49. Department of Posts initiated a number of projects during the Eleventh Five Year Plan for modernisation of mails network, which include: Mail network optimisation; setting up of automated mail processing centres; deployment of dedicated freighter aircraft for carriage of mail in North East as well as metro routes; National Address Database Management project for building and managing the address database across the country along with postal Geographic Information System (GIS) mapping of the country; and Mail Motor Vehicles project for monitoring the movement of mail vans for their effective management and route optimisation.

Rural Business and Access to Postal Network

16.50. During the Eleventh Five Year Plan, 'Access to the Postal Network' scheme was implemented for improving access to postal network. Major components under the scheme include: opening of new BPOs in Rural Areas, opening of BPOs by redeployment, opening of sub post offices by redeployment, opening of franchise outlets in urban areas, rationalisation of postal network by relocation of branch post offices and sub post offices and provision of Infrastructural equipment for extra departmental branch post offices.

Computerisation and Modernisation of Postal Network

16.51. The department has initiated the programme of Computerisation of Post Offices, Mail Offices, Administrative and other offices, establishment

of IT infrastructure and development of software applications. As a part of this programme, DoP has engaged M/s. Accenture for providing professional consultancy to develop a technology strategy and action plan for process re-engineering total networking and computerisation of post offices, administrative offices and offices of the accounts wing. A comprehensive IT roadmap has been developed for network architecture, integrated software, proper data management including strengthening/establishment of National Data Centre(s) and Disaster Recovery Centre. In addition, the DoP has initiated projects for (i) Computerisation and Networking of Departmental Post Offices, and (ii) Upgradation and modernisation of Postal Accounts Offices and Postal Accounts Wing of Postal Directorate. Under the Human Resource Management programme, multiple training programmes, covering all the cadres of employees including Business Orientation Programmes, Capacity Building, Technology Training, Standardisation of Training and departmental training for the officers, Postmasters and new entrants, were conducted.

Vision and Strategy for the Twelfth Five Year Plan

- To make the Department of Post's products and services customer's first choice and serve its customers with a human touch.
- To sustain its position as the largest postal network in the world touching the lives of every citizen in the country.
- To provide mail, parcel, money transfer, banking, insurance and retail services with speed and reliability.
- To provide services to the customers on value for money basis.
- To continue to deliver social security services and to enable last mile connectivity as a Government of India platform.

Objectives

16.52. To fulfil the mandate, the department needs to reinvent itself for providing best in class customer service and growing its existing businesses by developing a professional workforce and modernising and consolidating the network. The department also

needs to come up with new services including financial Services.

Policy Issues, Programme Reforms and New Initiatives in the Twelfth Plan

16.53. The India Post has more than 1,50,000 post offices and its reach in the rural India is unmatched. This network spread should be leveraged to provide services to the residents. The department needs to reinvent itself by embracing technology and redefining its role by taking up e-commerce, banking and financial services especially in the rural areas. The Indian Postal Office Act 1898 needs to be replaced with a new act keeping in line with the latest trends.

16.54. *IT Induction and Modernisation:* The major thrust of the Twelfth Five Year Plan would be on implementing the IT Induction and Modernisation programme. Implementation of new and improved processes, enterprise resource planning, integration and interlinking of applications, greater access, enhanced productivity, improved functionality and efficient and cost effective services would be the hallmark of this programme. The main features of the project include Supply of mail office hardware, Development and deployment of rural ICT, Banking and PLI solutions, Establishment of Data Centre and Disaster Recovery System, Network Integration, Development and deployment of Integrated Scalable Software and change management activities. The DoP also needs to implement 'Sevottam'—a Service Delivery Excellence Model and Quality Certification as per the corresponding standard IS 15700: 2005 during the Twelfth Five Year Plan. It is also proposed to attain ISO 9001 Certification for all Head Post Offices.

16.55. *Project Arrow:* The Project Arrow envisages upgradation of POs in urban and rural areas both in terms of upgrading and enhancing the quality of service in 'core areas' and improving the 'look and feel'. So far 1,736 POs have been covered under the project. This activity has won the Prime Minister Excellence Award during the year 2009–10. It is proposed to cover more than 2,500 POs under Project Arrow in a phased manner. It is also proposed to undertake audit of 1,000 post offices.

16.56. *Mails Sector:* The Twelfth Five Year Plan aims at ensuring readiness of the department not only for the anticipated mail volumes but also to meet rising customer expectations and competition from electronic channels of communication and private couriers. The main focus shall be on the Express mail segment, bulk mail and parcels which is presently the most competitive as well as profitable sector worldwide, as well as in India covering Speed Post, International Mail, First class mail and second class mail. While continuing with the Automated Mail Processing Centre (AMPC) project at Mumbai, Chennai, Hyderabad and Bangalore, AMPCs would be established at Ahmedabad, Jaipur, Kochi, Patna, Lucknow, Bhubaneswar, Ludhiana and Vashi (Navi Mumbai). Under the National Address Database Management Project, GIS maps for the entire country and address database for 300 million households is proposed to be developed. The department has also proposed to replace the existing bag sealing system with a new single use self-locking plastic seals and tag labels to improve environmental conditions in the POs.

16.57. The department is incurring heavy expenditure on account of payment of haulage charges to Railways for conveyance of mails and has become uneconomical as the Railways charges passenger displacement fares for RMS wagons instead of freight charges. Non-availability of adequate capacity of wagons also adds to abnormal delay in transmission of mails and adverse public reaction. The dynamics of new type of mail flow makes it imperative for the department to rethink its operational strategy in mail process and transmission. It is therefore proposed to replace rail based transportation on short hauls with road transport network by outsourced/departamental vehicles wherever feasible. It is also proposed to upgrade Mail Motor Service vehicles and containerised transportation of mail and procure 4-wheeled vehicles (one tonner), for mechanisation of Business Mail and Speed Post, two wheeler vehicles for delivery and collection at Mail Hubs/POs during Twelfth Five Year Plan. Postman is the key person, in the postal network and ensuring his mobility is essential for last mile delivery of mail.

16.58. *International Mails, Global Business and e-Commerce:* Quality and efficiency improvement for Express Mail Service (International) will be one of the priority programmes during the Twelfth Five Year Plan. Business process enhancements that improve the ease of doing business, reduce operating expenses and improve customer services would be reinforced. DoP also needs to revamp its mail/parcel delivery capabilities. Postal operators across the world are playing an important role in the development of e-Commerce. In the first phase, the entire range of postal products will be made available to customers online. In the final phase, the e-Commerce business of DoP will evolve into a best-in-class portal with e-market place functionality. It will be an online market place selling a variety of non-postal products.

16.59. A Centre of Excellence for promoting cooperation between India Posts and other designated postal operators of the world is proposed to be established with focus on evolving modern postal operations and practices through experience sharing. The proposed Centre of Excellence could take over all deliberations with member countries of UPU, PAPU, African Union and the Asia Pacific on matters of cooperation in consultancy, Human Resource and allied areas.

16.60. *Financial Services (Savings Bank and Remittances):* During the Twelfth Five Year Plan, the DoP has envisaged the setting up Post Bank of India with expansion of IT infrastructure along with Processing centres and Customer Call centres. Automatic Teller Machine network of the PO will be expanded to semi urban and block level POs. Integrated remittance services, including Mobile based remittance services will be introduced in order to exploit the penetration of mobile phones all over the country. In addition, an Anti-Money Laundering (AML)/Combating of Financing of Terrorism (CFT) Compliance Structure will be put in place.

16.61. *Postal Life Insurance (PLI):* During the Twelfth Plan period, it is proposed to increase the coverage of PLI beyond the Government and Semi Government employees and digitise the records of PLI/RPLI with

the objective to insure 15 million more lives. Several new products such as ULIPS and Group policies which will benefit the masses especially in rural areas will also be introduced. This will go a long way in providing financial inclusion and risk coverage to rural population with special emphasis on women workers and economically weaker sections of the society. It is also proposed to undertake technology upgradation to facilitate payment of online premium of policies through electronic clearance service facility and use of hand held devices by PLI/RPLI Sales force and operators.

16.62. *Rural Business and Access to Postal Network:* Improving the access to postal network and rationalisation of the existing network are important Plan objectives of the department during the Twelfth Five Year Plan. As the Panchayats are increasingly becoming hubs of various kinds of activities in the villages, it is important that the rural Branch Post Offices are co-located with Panchayats so that they are able to provide the required infrastructural support to all activities of Panchayats in the interest of rural population and also increase the revenues of the department. It is recommended that BPOs should be established at all the Panchayat headquarters to ensure efficient delivery of various services to the people in such areas and also to improve financial inclusion of the currently excluded people. Efforts would also be made to link different local and community institutions such as Aanganwadis and people's collectives including SHGs with the POs.

16.63. *Engagement with Social Protection Programmes:* Department of Posts is considered as the first choice as a delivery channel for various social protection programmes. Availability of an extensive postal network with vast experience of delivering financial and other services offers an opportunity to the Central/State Governments in India to address the constraints associated with delivery of various social protection programmes. The postal network can also be substantially engaged towards achieving financial inclusion in rural India. The department should collaborate with other Government and non-Government agencies to implement their schemes and programmes on financial inclusion.

The BPOs can also be leveraged to transmit information like weather, prices, transfer of knowledge on farm management and facilitate sale/distribution of farm inputs to the farmer right at his doorstep. This would call for building capabilities of rural postal personnel by imparting knowledge and skills on various Government programmes, banking, insurance, accounts and finance, entrepreneurship and usage of computers to Gramin Dak Sewaks in the country.

16.64. Business Development: It is essential for the department to include logistics as one of its core activities as development of logistics sector is of paramount importance for the economic development of the country and it offers excellent opportunity for the department to improve its revenues. The department also needs to take a leap forward in express parcel post service in view of the overall volume of business being transacted across the country, and improve the overall efficiency of speed post service delivery due to increased technological capabilities. Human resource development and management is of paramount importance for achieving the goal of reaching out to all sections of society and providing efficient services.

16.65. Estates Management: Building requirements of the DoP have undergone significant changes with large scale induction of technology. Thrust during the Twelfth Five Year Plan will be to provide functionally useful modern space for post office operations; improve the general ambience and aesthetics of postal buildings and provide modern facilities and amenities to the users of India Post.

16.66. Philately Operations: Indian philately is respected internationally for its theme and design and adherence to good international practices. Several initiatives are proposed to be taken up during the Twelfth Five Year Plan to promote the philately operations, right down to the district level, including establishment of research wing and consultancy for marketing.

16.67. Postal Accounts and Finance: As per the decision of Ministry of Finance, all Government departments have to migrate to accrual based accounting

system. The department has already initiated action on this line.

Key Constraints and Challenges

16.68. In the rapidly transforming communications and financial services sectors and emerging socio-economic trends within the country and globally, the DoP is facing challenges posed by globalisation, entry of the private sector, growth of telephony, focus on inclusive growth, higher level of delivery standards, developments in other Postal Administrations and so on in its quest of becoming self-sustaining. The DoP also has to address issues relating to multiplicity of application software, co-existence of manual and computerised processes and raising productivity norms and demand for greater accountability and transparency. In the area of financial services, challenge is to achieve the projected financial inclusion and rural empowerment. In addition, enhancing skills and faster generation of employment in the sector, decentralisation, empowerment, dissemination of information and rural transformation with credit facilities by the postal sector are some of the other challenges faced by the department.

The Path Ahead

16.69. The total revenue of the DoP increased by 6.6 per cent from 2007–08 to 2008–09, by 11.1 per cent in 2009–10 to 2010–11 and by 13.75 per cent in 2010–11 to 2011–12. This trend is indicative of the fact that incremental improvements in infrastructure, IT support and quality monitoring during Eleventh Plan has taken effect and with the roll out of all IT induction dependent activities like Core Banking, Rural ICT, Mail Network Optimisation and Modernisation, the upward trend will not only be sustained but will also register a higher percentage growth. The objective is to achieve the challenges with the help of ongoing as well as new schemes like expansion of Automatic Teller Machine network; expansion of Mail Processing Centres and Customer Call centres; Setting up Post Bank of India; e-commerce; Integrated remittance services and Mobile remittance service; and creation of an Anti-Money Laundering (AML)/Combating of Financing of Terrorism (CFT) Compliance Structure. Induction

of IT in all post offices will also help in revenue generation due to the speed and accuracy in transactions, transparency, improved customer grievance redressal and provision of greater range of services over a secured network.

INFORMATION AND BROADCASTING

Overview of the Sector

16.70. The Indian Media and Entertainment Industry has evolved as fastest growing sectors of the economy over the last few years and it is expected to grow at an annual average rate on 13.2 per cent in the next five years to reach ₹1.19 trillion in 2015. Television, Radio and Films are projected to grow at Compound Annual Growth Rate (CAGR) of 14.5 per cent, 19.2 per cent and 10 per cent respectively by 2015. Digitalisation, enhanced number of channels, increased number of private stakeholder, momentum in crossover movies and crossover audience, increasing share in the global market, domestic demand for animation and special effect are some of the salient features of this sector. India today has a large broadcasting and distribution sector comprising around 800 plus satellite TV channels, 100 Multi System Operators (MSO), 6,000 Independent Cable operators, around 60,000 Local Cable Operators (LCO), 7 DTH operators and several IPTV service providers. As per industry reports, out of a total of 138 million TV homes, about 30 million are dependent on Doordarshan's terrestrial broadcast services and 74 million are covered by cable services and the rest by Direct to Home (DTH) and Internet Protocol Television Services (IPTV) services. Television industry is more and more getting localised in nature with the spurt of regional channels over the last few years. Doordarshan (DD) is the world's largest terrestrial broadcaster with over 1,400 terrestrial TV transmitters. The reach provided by this route is phenomenal with DD covering 88 per cent of India's geographical areas and these transmitters provide coverage to about 92 per cent population of the country. It is estimated that Direct to Home (DTH) subscriber base could reach 70 million by 2015. With the widespread adoption of broadband in the country and the growing techno savvy population, Internet Protocol

Television (IPTV) has a potential to become a huge success in India. Appropriate policy guidelines have been adopted in respect of IPTV, Headend in The Sky (HITS), expansion of FM radio network (Phase III), and Community Radio Services, and so on FM Phase-III will extend radio's reach to 294 towns and 839 stations.

16.71. With convergence of technologies, it is now possible to provide multiple services on a single platform and on single device. To take full advantage of the technology, digitisation of broadcasting network needs to be given priority along with archiving of content and complete switch over to digital transmission. This would help usher in new value added services like Internet Protocol TV, Mobile TV and HDTV. This also calls for a policy to review the existing regulatory institutions and enactment for the establishment of a common regulator for content as well as for carriage.

16.72. The film and entertainment sector needs to be holistically reviewed in the light of technological interventions which have redefined entertainment today. The Cinematographic Act needs to be relooked to address issues relating to digital cinemas, piracy concerns. There is also a need to establish low cost cinema exhibition houses across the country to make cinema affordable. The film festivals needs to be more attractive and should be projected as a platform for encouraging film distribution, exhibition and other related activities.

16.73. There are various issues that revolve around this sector, these inter-alia include foreign investments, content regulation, intellectual property rights, content enrichment, restructuring of PrasarBharati, digitalisation of network and, content for archival and dissemination, issues of piracy, spectrum allocation and maintaining archives of the entire spectrum of Information and Broadcasting media unit.

Review of Eleventh Five Year Plan

Doordarshan

16.74. Eight new High Power Transmitters (HPTs) were set up at Port Blair (A&N), Kokrajhar

(Assam), Bikaner (Rajasthan), Dharamshala (H.P.), Chattarpur (M.P.), Saharsa (Bihar) and Bilaspur (Chattisgarh), thereby providing coverage especially to remote, hilly and border areas hitherto uncovered. Six high power transmitters were also commissioned at Kupwara (J&K), Jalgaon (Maharashtra), Vaodara (Gujarat), Barrmer (Rajasthan), Balurghat (W.B.) and Kharagpur (West Bengal), which enabled Doordarshan to provide reliable and extended service to the people. Two high power ageing and obsolete transmitters were also replaced with new transmitters at Chennai for DD1 and DD News thereby helping to improve the transmission quality. In addition, 56 Low Power Transmitters (LPTs) were also installed during the Plan period. This has increased the reach as well as quality of the TV services in the targeted areas. Also during the Plan, 34 new Very Low Power Transmitters (VLPTs) were installed. Capacity of Doordarshan's Direct To Home (DTH) platform 'DD Direct plus' was upgraded from 50 to 59 Standard Definition Television (SDTV) channels and 65,000 Set Top Boxes (STBs) along with 35,000 TV sets were distributed in remote and border areas. DTH Service in C-Band especially for Andaman and Nicobar (A&N) Islands was commissioned by setting up of a 10 Channel C-Band Earth Station at Delhi. This has enabled the people of A&N island territory to access 10 channels of Doordarshan.

16.75. Doordarshan as a Host Broadcaster of Commonwealth Games—2010, successfully provided coverage of Commonwealth Games Delhi—2010 in High Definition (HD) format. On the eve of Commonwealth Games, a new High Definition DD channel was launched by Doordarshan. Necessary HD uplinking facility in 'C' and 'Ku' bands was commissioned. There has been some setback in the physical and financial targets during Eleventh Five Year Plan period. The main reasons were litigation relating to procurement of transmitters, delay in approval of new schemes specially digitalisation scheme of Doordarshan, lengthy procurement procedure for machinery and equipment and re-tendering of work due to non-compliance of the specifications by bidders.

16.76. Digitalisation of Transmitters and Studios in DD Network: The Doordarshan network presently has 1,415 analog transmitters of varying powers providing coverage to 92 per cent of the population and 81.6 per cent by Area. Doordarshan network also comprises of 67 studio centres spread all across the country. Eleventh Five Year Plan scheme of digitalisation, which inter alia includes establishment of 40 digital transmitters and full digitalisation of 39 Studio centres, was approved at a cost of ₹620.12 crore in April, 2010. Digitalisation of Doordarshan network is targeted to be completed by December 2017. For digitalisation of its terrestrial Network, Doordarshan has planned to establish a total of 630 digital transmitters (HPTs-230 and LPTs-400) for providing the present level of coverage as is being provided by 1,415 analog transmitters.

All India Radio (AIR)

16.77. AIR launched digital transmission in DRM from a 250 kW Short Wave (SW) transmitter in Delhi. AIR programmes in digital quality are now available in UK, West Europe, Nepal, Mauritius, East Africa, Sri Lanka, Russia and NE Asia. Obsolete 1,000 kW Medium Wave (MW) transmitters at Rajkot and Kolkata (Chinsurah) have been replaced with state-of-the-art digital (DRM) transmitters. In addition to the western and eastern parts of India, AIR programmes to Afghanistan, Iran and Pakistan from the Rajkot transmitter and to Bangladesh, China and Nepal from the Kolkata transmitter would now be available in digital format. Establishment of permanent studios in Leh (J&K) and Tawang (AP) have been initiated and the studio facilities at Mysore (Karnataka) have been upgraded. New Studios are also getting ready at Jaipur and Dehradun, which will have digital production and transmission facilities. AIR has also commissioned satellite earth stations at Leh (J&K) and Rohtak (Haryana), enabling these areas to distribute news and other important programmes to other AIR stations in the regions. News-on-Phone Service has been introduced from 5 more stations—Lucknow, Imphal, Simla, Guwahati and Raipur, making a total of 14 such stations. Strengthening of radio coverage in the border areas and Jammu & Kashmir is of strategic importance for India. Therefore, a programme for strengthening

AIR and Doordarshan coverage in the J&K was taken.

16.78. Digitalisation Plan: The Eleven Five Year Plans have given impetus to the growth of broadcasting in India resulting in a phenomenal expansion. From the six radio stations at the time of independence, the network has now grown to 279 stations with 436 transmitters providing coverage to 99.18 per cent of the population and 91.85 per cent area of the country. AIR FM, which is increasingly becoming popular, provides coverage to about 37 per cent of population at present. Digitalisation of AIR production, transmission and networking infrastructure is to be completed by December 2017. But it has to be ensured that till that time, the listeners are not deprived of the programmes on the existing analogue receivers. During the Eleventh Five Year Plan a scheme for digitalisation of Transmitters (70 MW and 9 SW), Studios (98 nos) and Connectivity as well as augmentation of Training and R&D facilities was taken up.

Film Sector

16.79. There is a gradual increase in the number of countries and films participating in the International Film Festival of India (IFFI). During the 42nd IFFI which was recently concluded, 255 films from 67 countries participated. IFFI now attracts entries from all over the world. The participation by Indian films in various film festivals and in various film markets has also increased. During the Eleventh Five Year Plan, National Film Development Corporation (NFDC) has produced 11 films in different languages and 8 films are under production. Films Division has completed production of 183 documentaries and Children Film Society of India (CFSI) produced 11 feature films during this period. A programme was also taken up for digitisation and restoration of old films. Considerable progress has been made towards setting up of National Museum of Indian Cinema and is likely to be completed by 2013 to coincide with the Centenary year of Indian Cinema.

Information Sector

16.80. Directorate of Advertisement and Visual Publicity (DAVP) is the nodal multi-media

advertising agency of the Government which carries information on policies, programmes and achievements of various Ministries and Departments to masses through various media. It focused on the technological upgradation of its communication equipment and modernisation of its programme designs. In order to disseminate information on flagship programmes of the Government, Public Information Campaigns (PICs) is the most crucial and important component of the Media Outreach Strategy organised by Public Information Bureau (PIB) in joint collaboration with fellow media units of Ministry of Information and Broadcasting to raise awareness on flagship programmes of the Government. Song and Drama Division (S&DD) mounted a new Sound and Light Programme titled 'Jamunia' based on a Multi Media Theatrical format, which was well received by the people.

Broad Objectives, Targets and Thrust Areas during the Twelfth Five Year Plan

16.81. The growth potential of Media and Entertainment sector needs to be harnessed in order to place Broadcasting sector on a higher growth trajectory by taking advantage accrued due to convergence of technologies. In the liberalised economy, the role of Government has undergone a phenomenal change from a services provider to facilitator and there is a need for creating supportive policy environment for different stakeholders in the media and entertainment sector in order to step up the growth trend. There is a need to promote and facilitate the Broadcasting, Films and Print media industry in India to ensure its growth and development and to generate employment. Media Units need to be strengthened further to ensure dissemination of public messages in a more purposeful and efficient manner. Keeping in view the present day realities and emerging scenarios, their individual roles also need to be clearly redefined so as to achieve complete synergy in delivery mechanism among the media units. There is a need to ensure free flow of information to the public and safeguarding freedom of the media in general. The Government's role in making information available to people in strategic and inaccessible areas of the country should continue to remain paramount. Last but not the least, the

potential of software in film and broadcasting needs to be exploited internationally to make India a global soft power and there is a need to review the Acts, Rules and Regulation as per the contemporary needs of this sector. During the Twelfth Five Year Plan thrust would be on the following major programmes:

Broadcasting Sector

1. Digitalisation needs to be given thrust with special emphasis on convergence technology. The digitalisation of AIR, Doordarshan, Cable sector should be completed as per schedule.
2. Digital content needs to be given push during Twelfth Plan along with comprehensive programme audit of DD and AIR and to improve the content being telecast by DD/AIR.
3. Restructuring and strengthening of Prasar Bharati with the twin objectives of (i) enabling it to perform its primary role of Public Service Broadcaster (PSB) more purposefully and efficiently; (ii) making the non-PSB component self-financing within Twelfth Plan period.
4. Enhancing broadcast coverage in boarder areas and North Eastern areas through expansion of broadcasting infrastructure and services in the border areas.
5. Earmarking of some frequencies/channels of DD and AIR for niche programmes.
6. Expansion of FM coverage in the Twelfth Plan and dedicating one channel for nationwide news and current affairs FM channel.
7. Strengthening the capacity of Electronic Media Monitoring Centre (EMMC) for monitoring broadcast content including Private FM channels and Community Radio services.
8. Notification of policy and guidelines for Mobile TV services.
9. Supporting Community Radio Movement and Information, Entertainment and Communication (IEC) activities.
10. Installation of DRM+ transmitters at 50 locations including all state capitals and some other major cities in the country.
11. Replacement of 28 MW transmitters by FM and installation of 330 new FM transmitters (150 at the locations where private FM is coming

in phase III [but AIR does not have FM set up there], 25 at the locations for which demands from a number of VIPs are pending, 5 for additional channels and 150 in the uncovered areas).

12. Broadcasting Infrastructure Network Development.
13. Special Projects like Auditorium, Global Coverage of DD International Channel and Broadcast Museum.
14. IEC activities for promoting Digitalisation, Automation of Broadcasting wing and Capacity building of Cable TV industry in Digital wire line Broadcasting.

Film Sector

1. To devise appropriate policy initiatives for creating an enabling environment conducive to the growth and development of film sector including preservation and sustenance of the film heritage of India.
2. To devise appropriate policy for simplifying the procedure for clearance for setting up of film theatres.
3. To preserve and enhance public access to the archival wealth of films, video and audio resources.
4. To devise single window clearance system for film shooting in India, for both domestic and international film production houses.
5. To promote India as a film destination in film market and film festivals.
6. To aggressively pursue for entertainment tax and services tax to be subsumed in Goods and Services Tax (GST).
7. Establishment of a National Museum of Indian Cinema at Mumbai to coincide with the centenary year of Indian cinema in 2013.
8. Infrastructure Development Programme relating to Film Sector.
9. Development Communication and Dissemination of Film Content.
10. Anti-Piracy initiatives.
11. Setting up of National Film Heritage Mission.
12. Setting up of National Centre for Animation, Gaming and VFX.

Information Sector

1. To encourage information dissemination in traditional media through PPP mode for intensive campaign at village fairs, festivals and social gatherings.
2. To create awareness on social issues through inter-personal and live performance.
3. Media Infrastructure Development Programme.
4. Development Communication and Dissemination.
5. Human Resource Development.

Key Constraints and Challenges

16.82. Information and Broadcasting sector in the country will undergo a major facelift Twelfth Five Year Plan making it comparable with that of developed world. Some of the game changers and challenges for the sector are as follows:

1. *Going digital in TV and Radio*
 - a. The Government is committed to adhere to the date-line already notified for Cable TV digitalisation. HITS is an alternate platform to the cable sector.
 - b. Digitalisation of terrestrial transmission, adding to the digital network capacity in the country.
 - c. Digitalisation of All India Radio, particularly MW, SW and FM is another challenge. PrasarBharati has designed a plan of action to go digital to replace analogue MW and SW transmission through adoption of DRM+ technology.
 - d. Ensuring that PrasarBharati re-gains its lost position as public service broadcasting agency and becoming self-financing for non-PSB component.
2. *Community Radio Expansion and Community Empowerment*
 - a. Provision for adequate availability of fund for NGOs to initially set up Community Radio stations and judicious decision in terms of

policy intervention for increasing commercial airtime.

- b. Making this sector a vibrant medium of IEC, spurring content innovation and carrying message from the Government to the local people.
3. *Film Heritage Mission*
 - a. Film Heritage Mission will not only consolidate and add value to the cultural assets but also will act as a game changer in converting thousands of films to digital format. This Mission will help propagate India's cultural values to different countries.

Policy Issues and Recent Initiatives

16.83. The Ministry has taken a number of initiatives in the recent past with the objective to create an enabling environment in the information and broadcasting sector. These include:

1. *Broadcasting Sector*
 - a. *Policy on Headend in the Sky (HITS)*: HITS would provide greater channel capacity and is capable of bringing down the investments required at the level of the last mile operator, thereby enabling deeper penetration of cable services into rural areas. However, there is some constraint with regard to availability of transponder capacities for HITS services. The implementation of Digital Addressable System (DAS) in the cable TV sector would have a great positive impact on HITS services as it would enable HITS to penetrate and capture greater market share, particularly in rural areas.
 - b. *Policy on IPTV Service*: IPTV platform is promising due to its superior quality and interactive service but the reach is limited to households having broadband connections. Once broadband penetration in rural India improves, IPTV would stand a better chance of success. However, it is likely to take some time before the service makes inroads in the market.

- c. *Digital Addressable System (DAS) in the Cable TV Sector*: The Ministry has taken a major decision at reforming the present analogue cable television networks by digitalising the same to address the inherent drawbacks in the analogue networks. DAS will be implemented in a phased time bound manner with the complete switch off of analog cable TV service in the country by 31 December 2014. The implementation of DAS will be a game changer for the television sector and will take growth of broadcasting sector to new heights. It will benefit all stakeholders including cable operators, broadcasters, customers and the government.
- d. *Enhancement of FDI Limits in the Broadcasting Sector*: Rationalisation of Foreign Investments (FI) limits in various segments of broadcasting sector needs to be addressed. There is need for a holistic review of the existing FI limits for different segments of broadcasting sector.
- e. *Content Regulation and Broadcasting Regulator*: Regulation of content of Television channels and setting up an independent regulator for the broadcasting sector has been a much debated issue. Within the industry, the preponderant view is that self-regulation is the best way to regulate the media and no purpose would be served by introducing any other measures to regulate content. The Indian Broadcasting Foundation (IBF), taking a cue from NBA's self-regulation and in consultation with the Ministry, has set up a mechanism for self-regulation in case of general entertainment channels. As part of this, IBF has laid down Content Code and Certification Rules 2011 covering an entire gamut of content-related principles and criterion for television broadcast. The self-regulation mechanism put in place by the broadcasters will, however, not replace the existing regulatory functions of the Government, arising out of the extant statute, namely, Cable Television Networks (Regulation) Act, 1995 and Rules framed thereunder.
- f. *Amendment to the Guidelines on Uplinking/Downlinking of Channels*: There is need to make changes with respect to existing policy on uplinking/downlinking of Channels and teleports which, inter-alia, includes uniform permission period of 10 years for uplinking/downlinking of channels and teleports, stipulating time frame for operationalisation, enhancement of permission fee, mandatory submission of performance Bank Guarantee for fulfilling the roll out obligations. The proposed policy also provides for transfer of permission in case of merger/demerger/amalgamation with the approval of the Government.
- g. *Interoperability of DTH Set-Top-Boxes (STB)*: Interoperability of the STBs has been a long pending issue. Technical interoperability essentially protects the interest of the subscribers by enabling them to shift from one operator to another without having to buy a new STB.
- h. *License Fee Computation in DTH Sector*: Presently, the license fee collected by the Ministry of Information and Broadcasting from DTH operators is based on the Gross Revenue, as defined in the Article 3 of the Schedule to the DTH License Agreement. As per this definition, taxes revenue earned from the sale of Set Top Box, installation, commissions, content cost, subscription and service are required to be included for the purpose of calculation of annual license fee. The TDSAT has, however, in its orders dated 26 August 2008 and 28 May 2010, applied the principle of Adjusted Gross Revenue (AGR) for determination of annual license fee, removing majority of components such as installation charges, taxes, commissions, content cost, sale of STBs and so on. The Government has filed an appeal in the Supreme Court against these TDSAT orders. As of now, the DTH operators are paying license fee as per adjusted gross revenue which is less than according to gross revenue computation.
- i. *Rationalisation of Taxes in Broadcasting Sector*: A long standing demand of the

broadcasting sector has been for DTH, Cable Services, IPTV services, HITS services and for similar content distribution services, the Service Tax, Entertainment Tax and VAT be subsumed under the proposed Goods and Services Tax regime (GST) and only a single/unified GST rate be notified for these services.

- j. *Music royalty in FM Radio*: Music royalty issue is a major bone of contention between radio and music players and the royalty rates have been one of the problems affecting the viability of the private FM industry. The Copyright Board, which was given powers by the Supreme Court of India to decide in the matter of radio companies versus music rights owners on the issue of royalty payment, has decided to reduce the royalty payment to two per cent of their net advertising revenues. This matter is still not settled as music companies have challenged this order in court and the industry will need to wait for a final decision; however no stay has yet been granted.
- k. *Promotion of Indigenous Manufacturing Capacity*: A concern has been raised in various quarters that there is a lack of indigenous manufacturing capacities for broadcasting equipment in India. With digitalisation being one of the priority agenda for all the stakeholders, there is a need to enhance domestic manufacturing capabilities for production of STBs and other digital equipments.

2. Film Sector

- a. The Government has initiated steps for setting up of a mechanism for single window clearance for film shooting in India.
- b. The Ministry has taken up the matter with the Ministry of Finance for adoption of GST subsuming all service tax and entertainment tax under it.
- c. To enable expansion of the exhibition sector, the issue of simplification of regulatory clearances for setting up exhibition outlets needs to be addressed. State Governments will need

to be asked to explore possibility for granting exemption from entertainment tax to low cost theatres for Indian and world award winning cinema.

- d. Revision of the Cinematograph Act, 1952.
 - e. Declaring SRFTI, FTII as national centres of excellence enabled by an Act of the Parliament.
 - f. There is a need to resolve issues with respect to high rates of entertainment tax and lack of uniformity in tax structure, across States.
 - g. There are issues which need to be addressed as digital technology and broadband infrastructure include:
 - i. Establishment of uniform standards of technology for theatres;
 - ii. An effective preservation and archiving of films in digital formats vis-à-vis traditional forms of storage; and
 - iii. internet and web-based piracy of films.
 - h. *Countering Piracy*: The film sector faces the massive challenge of grappling with pirated software on web-based platforms in the current Indian environment. Further, mechanisms for regulation of content on the Internet are non-existent. Appropriate policy framework needs to be designed.
- ## 3. Information Sector
- a. In DAVP, on-line billing has been introduced. This has substantially raised the transparency level of its functioning. There is a need to take the matter forward by making DAVP's operation entirely online.
 - b. There is a need to periodically review the pricing of the Government spot in various channels in order to ensure that Government spots reach the maximum viewers and particularly at the regional channels catering to niche viewers.
 - c. While the Government has been spending a large sum of its publicity budget through DAVP, there is a need for periodical evaluation of the campaigns to ascertain their impact.

- d. There is a need to cover all districts of the country through Public Information Campaigns (PICs) during the Plan period and support for expansion of 'Jamunia' in all regional languages of the country.
- e. There is a need to take appropriate steps to make DFP (Directorate of Field Publicity) effective.
- f. There is need for an integrated approach by combining all the media units such as PIB, DAVP, DFP and S&DD engaged in information dissemination to ensure maximum impact of the Government information campaign on the people.
- g. Inter Media Publicity Coordination Committee (IMPCC), at the State capital level duly constituted by the Ministry needs to be strengthened and rejuvenated through appropriate policy direction to regularly meet, assess and refocus its media campaign.
- h. IIMC (Indian Institute of Mass Communication) needs to be upgraded to an institute of excellence in media education and research.

Path Ahead

16.84. The Twelfth Five Year Plan would aim at transforming the information, film and broadcasting sector into a modern, efficient, responsive and vibrant sector. To achieve this objective, necessary policy intervention, suitable infrastructure, investment in traditional as well as modern media unit, participation of private sector in PPP model, viable policy environment for facilitating and sustaining growth and development of media and entertainment sector need to be created. Apart from these, barriers in the way of investment in infrastructure, reaching out to rural, remote and inaccessible and strategic area need to be tackled effectively and efficiently. For optimal and efficient utilisation of resources, both manpower and capital, synergy between various media units of media and entertainment sector is required. Suitable plan/policies/programmes are needed in this direction.

16.85. The Twelfth Five Year Plan (2012–17) outlays (GBS) for the Ministry of Communications and IT and Ministry of Information and Broadcasting are given in Annexure 16.1.

ANNEXURE 16.1

Twelfth Five Year Plan (2012–17) Outlays for the Ministry of Communications and IT and Ministry of Information and Broadcasting

₹ in crore			
Ministry/Department	GBS	IEBR	Twelfth Plan Outlay
1. Ministry of Communications and IT			
• Department of Telecommunications	20,825.00	51,285.40	72,110.40
• Department of Electronics and IT	36,078.00	3,944.29	40,022.29
• Department of Posts	5,527.00	0.00	5,527.00
2. Ministry of I&B	7,583.00	1,000.00	8,583.00
Total	70,013.00	56,229.69	1,26,242.69

Rural Development

17.1. The Eleventh Plan period saw major new initiatives towards inclusive growth in rural India. The total budgetary allocation for all rural development programmes by the Government of India in the Eleventh Plan was ₹2,91,682 crores which accounted for 25 per cent of the total Central Budget Plan provision. Rural development programmes cover employment through the Mahatma Gandhi National Rural Employment Guarantee Act and the National Rural Livelihoods Mission, housing via the Indira Awaas Yojana and other State schemes and bank support, sanitation through the Total Sanitation Campaign, provision of drinking water via the National Rural Drinking Water Programme, social security through the National Social Assistance Programme, watershed development via the Integrated Watershed Management Programme (covered in Chapter 5 of Volume 1), road connectivity through the Pradhan Mantri Gram Sadak Yojana (described in Chapter 15 of Volume 2) and electrification via the Rajiv Gandhi Grameen Vidyutikaran Yojana (described in Chapter 14 of Volume 2).

17.2. Based on a critical review of these programmes and their performance in the Eleventh Plan, this chapter outlines the major new initiatives proposed during the Twelfth Plan period.

MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE ACT (MGNREGA)

The Experience So Far

17.3. The most significant rural development initiative of the Eleventh Plan period was the Mahatma

Gandhi National Rural Employment Guarantee Act (MGNREGA). Over the last six years, MGNREGA has delivered the largest employment programme in human history, which is unlike any other in its scale, architecture and thrust. Its bottom-up, people-centred, demand-driven, self-selecting, rights-based design is new and unprecedented. Never have in such a short period so many crores of poor people benefited from a Government programme.

17.4. In 2011–12, nearly 5.00 crore families were provided over 211 crore person-days of work under the programme. Over the last six years, MGNREGA has generated more than 1,200 crore person-days of work at a total expenditure of over ₹1,66,760 crores. The share of SC/ST families in the work provided under MGNREGA has been 55 per cent and 45 per cent of workers are women. Average wages of workers have gone up by 54 per cent over the last five years and wages have now been so indexed that workers will be protected from the ravages of inflation. Nearly 10 crore bank/post office accounts of our poorest people have been opened and around 80 per cent of MGNREGA payments are made through this route, an unprecedented step in the direction of financial inclusion. An overview of MGNREGA performance from 2006–07 to 2011–12 is given in Table 17.1.

17.5. In many parts of the country, spectacular successes have been recorded in water harvesting. Distress migration has been arrested in several areas. Some State Governments have been leaders in this and the National Consortium of Civil Society Organisations on MGNREGA has also set up examples of excellent work.

TABLE 17.1
Overview of MGNREGA Performance, 2006–12

	2006–07 (200 Districts)	2007–08 (330 Districts)	2008–09 (All Districts Hereon)	2009–10	2010–11	2011–12
Households Employed (crore)	2.10	3.39	4.51	5.26	5.49	4.99
Person-days of Employment generated (crore)	90.5	143.59	216.32	283.59	257.15	211.41
Work Provided per year to Households who worked (days)	43	42	48	54	47	42
Central Release (₹ crore)	8,640.85	12,610.39	30,000.19	33,506.61	35,768.95	29,184.85
Total Funds Available (including Opening Balance) (₹ crore)	12,073.55	19,305.81	37,397.06	49,579.19	54,172.14	43,273.58
Budget Outlay (₹ crore)	11,300	12,000	30,000	39,100	40,100	40,100
Expenditure (₹ crore)	8,823.35	15,856.89	27,250.10	37,905.23	39,377.27	37,548.79
Average Wage per day (₹)	65	75	84	90	100	117
Total Works taken up (lakhs)	8.35	17.88	27.75	46.17	50.99	74.13
Works completed (lakhs)	3.87	8.22	12.14	22.59	25.90	15.01

Source: Ministry of Rural Development, GoI.

17.6. Many critics and sceptics of MGNREGA who were extremely vocal during the years leading up to its passage by Parliament and in the early years of its implementation have been silenced, especially after it was recognised that the purchasing power the programme created in rural areas and the operation of the Keynesian multiplier played a crucial role in generating demand for industry during the dark days of the recession and assisted in our comparatively faster emergence out of it.

17.7. However, there is no denying the fact that the true potential of MGNREGA as an instrument of rural transformation is yet to be fully realised. Since the programme marks a radical departure from earlier efforts of a similar kind, there have been many problems in infusing the system with the new culture of demand-driven, rights-based, decentralised decision-making. The MGNREGA provides a historic opportunity for strengthening Panchayati Raj in India but the experience so far also alerts us to the need for doing much more in this direction.

17.8. There are problems that arise from the sheer scale of the programme. At the same time, new opportunities have arisen because of advances in

Information Technology that allow us to get rid of inefficiencies and corruption in a manner quite inconceivable in the past. The MIS currently used by MGNREGA is already the best we have ever had. More than 8 crore muster rolls and over 12 crore job cards have been placed online. But there is huge scope for further improvement in overcoming systemic delays as shown by the software being used, for example, in Andhra Pradesh.

17.9. We also need to view MGNREGA as a programme whose success will, in itself, pave the way for its downscaling. A large proportion of MGNREGA workers are small and marginal farmers, the productivity of whose lands has been so decimated over the years, that they have been compelled to work under MGNREGA. The real success of MGNREGA will lie in raising the agricultural productivity of millions of these farmers who will then be able to return once again to farming and will no longer need to depend on MGNREGA for their survival. Urgent measures are required to convert MGNREGA into a productivity-enhancing instrument that will also allay the falsely perceived conflict between MGNREGA and agriculture—for MGNREGA is the foundation for solving the problems of the poorest farmers of our country.

Relationship with Agriculture and Rural Livelihoods

17.10. Ever since work on MGNREGA was launched in 2006 there have been two divergent perceptions about its relationship with agriculture—one, as a relationship of positive synergy and the other, of a potential source of conflict. The sources of synergy are many:

17.11. The MGNREGA has led to major increases in wages of rural workers and when we recognise the fact (attested by NSSO data on ‘landed labourers’) that the majority of MGNREGA workers are impoverished small and marginal farmers, especially in our tribal areas, we can see the direct impact MGNREGA has made on raising incomes of our small and marginal farmers.

17.12. A comprehensive time series of rural wage data—both agricultural and non-agricultural—put together by the Ministry of Statistics and Programme Implementation indicates that the advent of MGNREGA has resulted in a significant structural break in rural wage increases.¹ Between 1999 and 2005, pre-MGNREGA, nominal wages in the rural economy grew at an average annual rate of 2.7 per cent (year on year average). Post-MGNREGA, the rate of average wage increases almost quadrupled to 9.7 per cent between 2006 and 2009. And between January 2010 and May 2011 (the last date for which this data is available), annual nominal wage growth averaged almost 18.8 per cent. Since January 2010, agricultural wages rose 20.2 per cent over year ago while non-agricultural rural wages increased 16.7 per cent over year ago. Wage growth for men in the agricultural sector averaged 19.7 per cent over year ago while that for women 20.8 per cent over year ago. The average daily wage rates for male agricultural labour are given in Table 17.2 (A).

17.13. State-wise trends in the wages of casual workers in rural areas compiled by the Labour Bureau, Shimla indicate that agricultural wages are booming at the fastest rate ever. The Labour Bureau’s data, compiled on a monthly basis, are based on primary information collected from 600 sample villages over

20 States. They cover wage payments both in cash as well as kind, with the latter valued at the prevailing local retail prices.

17.14. The tightening of the labour market post-MGNREGA is a positive indicator of poverty alleviation and also signals a pressure for technological advances that raise farm productivity in areas of relative labour shortage. This is the process of agrarian transformation the world over.

17.15. What is more, since a very large proportion (80 per cent) of the works under MGNREGA are also focused on soil and water conservation on the lands of the small and marginal farmers, it is clear that MGNREGA is making a potential contribution to raising their incomes through improved agricultural productivity, and also reducing the need for small and marginal farmers to continue to work on MGNREGA sites. Studies conducted by Indian Institute of Science (IISc), Bangalore; Indian Institute of Forest Management, Bhopal; Administrative Staff College of India, Hyderabad and University of Agricultural Sciences, Bangalore have all concluded that MGNREGA works have had a positive impact on agricultural productivity. In one of the studies conducted in Chitradurga district of Karnataka, IISc found that MGNREGA works, besides enhancing agricultural productivity, successfully reduced water, soil and agricultural vulnerability.

17.16. As far as the perception of conflict between MGNREGA and agriculture is concerned, this is based on a number of misconceptions and exaggerations.

17.17. Let us first remember that the average annual person-days of work generated under MGNREGA since inception has never exceeded 54 days. Surely this in itself indicates the critical but still small and supplementary nature of this employment for our self-selecting poorest people. And if we closely examine the question of seasonality of this work, an analysis of the quantum of MGNREGA works provided across the year indicates a powerful seasonal fluctuation, with a disproportionately higher share of works

TABLE 17.2 (A)
Average Daily Wage Rates for Agricultural Labour: Male

(in ₹)

State	December			% Increase	
	2008	2009	2010	Dec 09/Dec 08	Dec 10/ Dec 09
Andhra Pradesh	98.31	137.95	176.29	40.32	27.79
Assam	81.19	96.40	114.10	18.73	18.36
Bihar	71.42	86.55	101.85	21.18	17.68
Gujarat	78.72	82.76	91.36	5.13	10.39
Haryana	132.64	168.22	195.02	26.82	15.93
Himachal Pradesh	164.72	180.42	195.22	9.53	8.20
Karnataka	72.90	87.54	111.76	20.08	27.67
Kerala	220.27	250.79	319.13	13.86	27.25
Madhya Pradesh	61.33	69.79	84.43	13.79	20.98
Maharashtra	82.61	95.10	119.36	15.12	25.51
Orissa	68.05	86.70	123.96	27.41	42.98
Punjab	130.63	133.49	176.21	2.19	32.00
Rajasthan	109.84	113.65	145.69	3.47	28.19
Tamil Nadu	113.28	137.98	174.08	21.80	26.16
Uttar Pradesh	81.14	94.89	116.53	16.95	22.81
West Bengal	87.40	99.94	118.47	14.35	18.54

Note: Average rate for five operations (ploughing, sowing, weeding, transplanting and harvesting) has been considered.

being done during the off-season in agriculture. The month-wise employment data under MGNREGA during FY 2010–11 (Table 17.2 B) indicates that it is in the lean agricultural season (January–June), that around 70 per cent of person-days of work were generated. And if we were to correct for the fact that in major MGNREGA States like Tamil Nadu this is actually not the lean season, the proportion of MGNREGA work provided in the off-season in agriculture would be even higher.

Expanded List of Works

17.18. During the Twelfth Plan we propose to allow the largest possible number of works which help strengthen the synergy between MGNREGA and agriculture without compromising on the fundamental features of the Act or its architecture, which have been celebrated across the globe. The more rural people feel a sense of resultant ownership and a stake in the programme, the more efficiency and transparency we will be able to achieve. The list of works

has also been expanded in response to demands of the States for greater location-specific flexibility in permissible works, as also to help improve the ecological balance in rural India and provide a cleaner, healthier environment to its people (Table 17.3). In response to each of these demands, Schedule I of the Act has been modified to provide an additional list of permissible works under MGNREGA. Some of these works are new but many of them come within the category of works already permitted under MGNREGA. This is being provided in response to demands from States for more elaborate, specific and unambiguous list of works that could be taken up under the categories currently permissible.

17.19. Each work indicates the unit cost as also the labour–material ratio. These unit cost estimates are indicative and provide a broad order of magnitude. They may vary depending on local conditions and more updated SoRs. However, the labour–material ratio specified for each work must be strictly adhered

TABLE 17.2 (B)
Seasonality of MGNREGA Employment Provided during 2010-11

State	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March	Total
	%	%	%	%	%	%	%	%	%	%	%	%	%
Andhra Pradesh	23.5	33.3	22.5	6.9	2.5	1.1	1.0	0.7	0.7	0.8	1.8	5.2	100.0
Assam	9.8	6.6	4.2	3.3	4.9	6.5	6.7	9.6	13.7	11.8	11.1	11.7	100.0
Bihar	11.2	13.7	11.4	6.2	5.6	6.8	5.4	5.7	8.9	9.5	9.3	6.3	100.0
Chhattisgarh	19.6	27.1	14.2	1.3	0.7	1.0	2.0	1.8	3.2	9.7	10.8	8.7	100.0
Goa	6.9	7.7	7.3	6.8	7.4	4.8	6.5	5.8	10.1	14.5	12.8	9.4	100.0
Gujarat	18.1	26.8	10.7	4.0	2.8	2.3	3.1	4.3	6.3	8.4	7.2	5.9	100.0
Haryana	3.8	3.5	3.1	3.4	5.1	6.0	8.1	10.3	13.5	16.3	13.8	13.2	100.0
Himachal Pradesh	9.7	12.9	12.0	10.1	9.5	9.4	7.2	8.2	5.4	1.9	4.2	9.4	100.0
Jammu And Kashmir	3.7	3.3	3.0	5.6	7.0	8.8	11.2	12.7	14.9	12.4	9.3	8.0	100.0
Jharkhand	11.9	13.2	11.3	7.6	6.8	8.6	6.2	4.8	5.9	7.7	8.6	7.5	100.0
Karnataka	0.5	0.6	1.3	1.6	2.2	3.2	4.7	5.4	7.5	13.3	26.9	32.8	100.0
Kerala	3.0	6.0	7.6	9.8	8.0	10.1	7.1	7.2	8.8	11.3	11.2	9.9	100.0
Madhya Pradesh	15.7	18.0	16.6	7.5	3.8	3.2	3.4	3.8	6.7	8.1	7.6	5.4	100.0
Maharashtra	28.8	25.1	12.9	3.4	1.7	1.3	1.5	1.3	3.4	4.7	7.3	8.6	100.0
Manipur	3.3	11.8	4.7	11.5	13.0	10.9	10.2	5.0	4.3	12.7	8.8	3.9	100.0
Meghalaya	8.7	7.2	8.7	9.1	10.4	11.6	10.2	9.2	6.8	6.6	6.1	5.5	100.0
Mizoram	6.7	6.4	9.8	7.0	7.1	8.9	8.1	8.2	6.3	7.2	14.0	10.4	100.0
Nagaland	14.0	11.6	8.9	7.1	8.6	5.9	7.0	11.1	7.8	7.0	5.5	5.6	100.0
Odisha	16.8	24.6	12.7	3.1	2.8	3.3	4.0	4.7	5.9	6.8	8.2	7.2	100.0
Punjab	7.8	9.6	10.4	6.8	7.4	7.9	7.5	5.7	5.7	5.5	8.2	17.5	100.0
Rajasthan	12.4	22.9	26.5	9.4	2.7	1.5	1.1	1.2	2.9	6.0	7.2	6.1	100.0
Sikkim	6.5	9.0	9.5	8.9	5.0	6.6	3.3	5.9	11.1	15.6	11.5	7.0	100.0
Tamil Nadu	12.4	12.6	12.1	15.9	10.7	7.6	7.7	3.2	3.8	3.6	5.2	5.2	100.0
Tripura	3.7	7.7	9.4	9.5	11.9	13.2	7.2	5.7	5.2	8.6	8.0	9.9	100.0
Uttar Pradesh	8.8	9.8	10.5	9.6	5.9	2.9	1.9	4.5	11.1	13.5	12.2	9.3	100.0
Uttarakhand	8.2	6.0	6.3	6.8	7.7	6.1	6.2	7.6	11.3	14.5	11.3	7.8	100.0
West Bengal	17.0	16.3	14.6	7.4	4.1	4.0	3.2	2.9	4.8	8.3	9.9	7.4	100.0
Andaman and Nicobar	23.7	9.7	11.7	3.7	1.5	0.0	0.8	1.3	1.3	25.3	16.8	4.0	100.0
Lakshadweep	4.5	1.9	11.1	24.0	11.2	10.7	4.8	11.7	9.1	6.5	4.3	0.3	100.0
Puducherry	4.1	12.0	19.6	24.0	16.7	13.6	9.9	0.0	0.0	0.0	0.1	0.0	100.0
All India	13.5	17.3	14.4	8.0	5.0	4.1	3.7	3.7	5.7	7.6	8.7	8.3	100.0

to. Many of these activities entail a higher material component but it must be ensured that in the final mix of activities chosen by the Gram Panchayat, the overall labour-material ratio in each Gram Panchayat is maintained at 60:40. The selection of more material-intensive works and their number must be done within this overall constraint. While

taking up works under MGNREGA, the following conditions will need to be followed:

- Only those works to be taken up that result in creation of durable assets
- The order of priority of works will be determined within the GP

TABLE 17.3
Additional List of Permissible Works Under MGNREGA

No	Work	Standard Dimensions	Unit Cost	Wage: Material Cost Ratio
A. WATERSHED RELATED WORKS				
1.	Contour Trenches	Cross section 0.5m*0.5m	₹11,300 per hectare	100:0
2.	Contour Bunds	height 0.6m, base width 2.0m and cross-sectional area of 0.66 sq.m	₹13,637 per hectare	100:0
3.	Boulder Checks	7m length, maximum height 1m, upstream and downstream slopes 1:1 and 3:1, top width of 0.5m	₹1,600	100:0
4.	Farm Bunding	height 0.6m, base width 1.7m and cross-section area 0.57 sq.m	₹7,729 per hectare	100:0
5.	Gabion Structures	2m height, 1m top width and 12m length	₹45,000	30:70
6.	Underground Dykes	12m length, 6m maximum depth and 2m top width	₹43,000	70:30
7.	Earthen Dams	65m length, maximum height 4.65m, upstream and downstream slopes 2:1 and 2.5:1, top width 2m	₹2.63 lakhs	95:5
8.	Dugout Farm Ponds	25m*20m*2m	₹98,470	100:0
9.	Stop Dams	length 20m, maximum height 2.7m, top width 1.5m and side slopes 1:1	₹5.32 lakhs	25:75
B. WATERSHED RELATED WORKS IN MOUNTAIN REGIONS				
10.	Springshed Development	Various watershed interventions	₹18,000–₹38,000 per hectare	90:10–60:40
C. AGRICULTURE RELATED WORKS				
11.	NADEP Composting	3.6m*1.5m*0.9m	₹8,000	25:75
12.	Vermi-Composting	3.6m*1m*0.75m	₹9,000	25:75
13.	BioLiquid Manure	Sanjeevak Pit 1m*1m*1m	₹2,000	30:70
D. LIVESTOCK RELATED WORKS				
14.	Poultry Shelter	7.5 sq m for 100 birds	₹40,000	20:80
15.	Goat Shelter	7.5 sq m for 10 animals	₹35,000	25:75
16.	Pucca Floor, Urine Tank and Fodder Trough for Cattle	Cattle shed floor 26.95 sq.m, 1 cu.m fodder trough and cattle urine collection tank 250 litres	₹35,000	30:70
17.	Azolla Cattle-Feed	Azolla pit 2m x 2m x 0.2 m	₹2,000	15:85
E. FISHERIES RELATED WORKS				
18.	Fisheries in Water Bodies on Public Land	500 cu.m fish nursery pond, excavation of 15000 cu.m in tank bed, fish drying platform 30 sq.m	₹11 lakhs (₹75 per cubic metre)	80:20
F. WORKS IN COASTAL AREAS				
19.	Fish Drying Yards	10m*10m, 15 cm thick plain cement concrete, brick protection work 20 cm thickness	₹75,000	15:85
20.	Belt Vegetation	Plant	₹20	80:20
21.	Storm Water Drains	100 m long storm water drain	₹2.3 lakhs	15:85
G. RURAL DRINKING WATER RELATED WORKS				
22.	Soak Pits	NRDWP specifications	₹2,000	50:50
23.	Recharge Pits	NRDWP specifications	₹5,000	50:50

(Contd.)

(Table 17.3 Contd.)

No	Work	Standard Dimensions	Unit Cost	Wage: Material Cost Ratio
H. RURAL SANITATION RELATED WORKS				
24.	Household Toilets	TSC specifications	₹4,500	60:40
25.	School Toilets	TSC specifications	₹35,000	25:75
26.	Anganwadi Toilets	TSC specifications	₹8,000	25:75
27.	Solid Liquid Waste Management	TSC specifications for 1000 people	₹5 lakhs	35:65
I. FLOOD RELATED WORKS				
28.	Deepening and Repair of Flood Channels		main channels: ₹180/ metre field channels: ₹30/ metre	100:0 100:0
29.	Chaur Renovation		₹4,76,000 per hectare	100:0
J. IRRIGATION COMMAND RELATED WORKS				
30	Rehabilitation of Minors, Sub-Minors and Field Channels		₹3,000 per hectare	60:40

Source: Mihir Shah Committee (2012): MGNREGA Operational Guidelines, MoRD, GoI.

- 60:40 ratio for labour:material costs should be maintained at the GP level
- No contractors/labour-displacing machinery to be used

Strengthening the Demand-driven Character of MGNREGA

17.20. The single most important distinguishing feature of MGNREGA from employment programmes of the past is that provision of work is triggered by the demand for work by wage-seekers and provided as their legal right. All previous employment programmes provided work when governments decided to provide work, not when people demanded work. MGNREGA is to change that. The old practice of *jab kaam khulega, tab kaam milega* has to be changed to *jab kaam maangege, tab kaam khulega*. This requires that we pay very close attention to generating awareness among potential wage-seekers and set up systems that facilitate and rigorously record registration for work, issuance of job cards and application for work.

17.21. The major weakness so far has been that States have not set up effective systems of recording demand. The new MGNREGA Guidelines in operation from the Twelfth Plan (Box 17.1) take major steps to overcome this weakness.

Labour Budget

17.22. A unique feature of Mahatma Gandhi NREGA is its demand-driven character. But before we begin to record demand we need to make a prior assessment of the quantum of work likely to be demanded as also ascertain the timing of this demand. Concomitantly, we need to prepare a shelf of projects that would allow us to meet this demand. This matching of demand and supply of work is the process of planning under MGNREGA and this is to be achieved through the preparation of a Labour Budget, which has two sides—one, assessment of quantum and timing of demand for work and two, preparing a shelf of projects to meet this demand in a timely manner.

17.23. A Labour Budget must, therefore, reflect

1. Anticipated quantum of demand for work
2. Precise timing of the demand for work, and also
3. A plan that outlines the quantum and schedule of work to be provided to those who demand work

17.24. This is the only way work-providers can open work in a manner that is synchronised with the pattern of migration in that area so as to preempt distress migration. It must also be incumbent upon work-providers to proactively inform

Box 17.1**New Guidelines to Strengthen Demand-driven Character of MGNREGA**

1. The Gram Panchayat or Programme Officer, as the case may be, shall be bound to accept valid applications and to issue a dated receipt to the applicant.
2. Refusal to accept applications and provide dated receipts will be treated as a contravention under Section 25 of MGNREGA.
3. The provision for submitting applications for work must be kept available on a continuous basis through multiple channels so designated by Gram Panchayats who may empower ward members, anganwadi workers, school teachers, self-help groups, village-level revenue functionaries, common service centres and Mahatma Gandhi NREGA Labour Groups to receive applications for work and issue dated receipts on their behalf.
4. Provision must also be made (wherever feasible) for workers to register applications for work through mobile telephones in addition to the MGNREGA website and this should feed in directly into the MIS. In case of mobile telephones, the system must be made convenient to illiterate workers and may include Interactive Voice Response System (IVRS) and voice-enabled interactions. This option must automatically issue dated receipts.
5. State Governments will ensure that the MGNREGA MIS will record the demand for work. It will track (for each GP) the gap between date of application for work and date of opening of work.
6. MGNREGA software will automatically generate the pay order for payment of unemployment allowance to such wage seekers whose demand for work is not met within 15 days of demand. Reports prepared on this will have to be part of the essential set of reports to be tracked at the State level.

Source: Mihir Shah Committee (2012): MGNREGA Operational Guidelines, MoRD, GoI.

work-demanders well in advance about the schedule of work to be provided so that they do not need to migrate in distress.

17.25. These plans are currently supposed to be presented for approval only at the Gram Sabha on 2nd October each year. This is far too late to prevent distress migration of households because decisions on migration are normally taken in the monsoon season. In the absence of a timely work guarantee, many are likely to migrate after the harvest of the kharif crop. It is important, therefore, for the GP to inform potential workers of available employment and the timing of this employment well in advance of the kharif harvest. With effect from the Twelfth Plan, annual plans will be presented by the Gram Panchayat at a Gram Sabha meeting to be held on the 15 August.

Planning for an Adequate Shelf of Projects

17.26. As demand gets better recorded, there needs to be a corresponding increase in supply of work. This requires strengthening of capacities at the cutting-edge level of implementation. Unfortunately, the main implementing agency under MGNREGA, the Gram Panchayat, is badly lacking in capacities to plan and implement high quality works under MGNREGA. This is also the missing 'F' (functionaries) which

could galvanise PRIs, especially Gram Panchayats, as the bedrock of Indian democracy.

17.27. Beginning with the Twelfth Plan, each Block will appoint a full-time Programme Officer for Mahatma Gandhi NREGA. It will not be good enough for BDOs or other block officers to be given 'additional charge' for the programme. It has also been decided that blocks, where either scheduled castes plus scheduled tribes form greater than or equal to 30 per cent of the population or the annual MGNREGA expenditure was more than ₹12 crores in any year since the programme started, will mandatorily have at least three Cluster Facilitation Teams (CFT), each of which will service a Cluster of Gram Panchayats (CGP), being accountable to each GP within their Cluster. Each CGP will cover around 15,000 job cards or an area of about 15,000 ha, broadly corresponding to the boundaries of a milli-watershed and local aquifer. The CFT will comprise a fully dedicated, three-member professional support team for MGNREGA. The CFT will be a multidisciplinary team led by an Assistant Programme Officer (APO) and will comprise specialists in earthen engineering, community mobilisation, hydrogeology, agriculture/allied livelihoods. This will enable more professional planning based on the watershed approach aimed at improved land and water productivity.

TABLE 17.5
Accountability Matrix for Delays in Wage Payments under MGNREGA

Reasons for Delay in Wages	Enter the Designation of Personnel/Officer Responsible for Delay in Wage Payments and Number of Days of Delay					
	Centre	State	District	Block	GP	Paying Agency
Delay in making available the MGNREGA funds						
Delay in closing of muster rolls						
Delay in measurement						
Delay in data-entry, generation of pay order						
Delay in issuing cheque for wage-payments						
Delay in transfer of cash to sub-agency						
Delay in end-point wage disbursement						

MGNREGA staff/agency responsible for meeting the timelines. Non-adherence to stipulated timelines should be penalised and the states should levy penalties on MGNREGA staff or agency responsible for any delay in wage payments. An accountability matrix (Table 17.5) will be used to track the inefficiencies in delay in wage payments and disciplinary/punitive actions shall be initiated accordingly.

17.31. An important cause for delay of wage payments is also non-availability of sufficient funds at district/block/GP level. In some districts/blocks/GPs there is shortage of MGNREGA funds, while in others there is a surplus. Once the MGNREGA fund is allotted to a district/block/GP, it is very difficult to perform transfers of the fund across district/block/GP. Fund allocation hence becomes an arduous task in implementation of MGNREGA. To tackle this problem, MGNREGA 2.0 proposes an integrated fund management system called e-FMS (Electronic Fund Management System) which ensures that the MGNREGA fund is not excess or deficient at any level. Under e-FMS, the MGNREGA fund is a centrally pooled fund managed at state level. The users, that is, GP at village level or Programme Officer at Block level or DPC at district level, all across the State, are the users of this centralised fund and will have access to this pooled fund (with certain restrictions). The users can now undertake only electronic transactions through the centralised fund, for the purpose of wage/material/administrative payments as per the actuals (with certain ceilings). All electronic transfers

are realised in a span of 24 hours. Based on this principle of centralised fund and decentralised utility, the e-FMS ensures timely availability of funds at all levels and transparent usage of MGNREGA funds. This improves efficiency of the programme on the whole and also has a multiplier effect on timely delivery of wage payments.

Strengthening Banks and Post Offices

17.32. Another inadvertent source of delays has been the decision by Government for MGNREGA payments to be made through banks and post offices. While this has led to a palpable reduction in leakages, the lack of sufficient density of banks/POs and lack of adequate personnel manning them, has emerged as a major bottleneck, especially in remote, tribal areas, contributing to delays in wage payments. The Business Correspondent (BC) model is one way to overcome these problems. In order to strengthen the viability of the BC model, the Ministry of Rural Development (MoRD) has written to all States asking them to appoint BCs through a transparent process of selection with ₹80 per active account per year to be absorbed under the 6 per cent administrative expenditure head of MGNREGA. This is an interim measure that will help BCs overcome teething problems before they mature to self-sustaining viability as their business expands. A major point of delay has been the crediting of workers' bank accounts as this involves physical movement of cheques and wage lists from the GP to the bank after which banks are required to feed in details of the bank

accounts of wage earners once again. To make this transaction seamless, MoRD has worked with five banks in four States (Orissa, Gujarat, Rajasthan and Karnataka) to successfully develop electronic transfer of data files to banks. This solution is now being taken up in other States also and should be in place by the second year of the Twelfth Plan in all States. This will reduce the time taken in crediting accounts of workers.

17.33. A similar solution is being developed for transmitting data to Head Post Offices (HPOs) which will cut down the time required for documents to travel from Branch Post Offices (BPOs) to HPOs via Sub-Post Offices. This is being already tried out in Rajasthan. A major problem faced by BPOs is that their cash and line limit is very low. States need to raise the cash and line limit for their BPOs so that they are not strapped for funds while making payments to MGNREGA workers. A provision is being made that, in consultation with the Chief Post Master General for the circle, an amount equal to one month's wages will be mandatorily required to be kept with the HPO to avoid delays on account of clearance of cheques and so on.

Better Social Audits, Vigilance and Grievance Redressal

17.34. Given the large number of complaints of corruption, MGNREGA 2.0 pays great attention to strengthening both preventive and ameliorative measures to address the issue. Whereas in Andhra Pradesh, social audits have been institutionalised by State Governments, they have worked very well. They have proved a great check on corruption and large recoveries have also been made. Under MGNREGA 2.0, the MoRD has notified Social Audit Rules that mandate the establishment of a Social Audit Unit (SAU) to facilitate conduct of social audit by Gram Sabhas. This Social Audit Unit can be either a Society or a Directorate, in each case independent of the implementing departments/agencies. The Social Audit Unit shall be responsible for building capacities of Gram Sabhas for conducting social audit by identifying, training and deploying suitable resource persons at village, block, district and State-level drawing from primary stakeholders and other civil society

organisations having knowledge and experience of working for the rights of the people. The SAU will create awareness amongst the labourers about their rights and entitlements under the Act and facilitate verification of records with primary stakeholders and work sites. All States have agreed that they will immediately initiate this process and social audit will first be completed in all Gram Panchayats in one selected block in every State.

17.35. States are now required to upload photographs of works at different stages of execution through the Ministry's software NREGASoft. A pilot has been launched in the Ramgarh district in Jharkhand for use of the Aadhaar number for biometric based authentication of payments to MGNREGA workers. The Aadhaar number along with the job card number will be now part of the MIS to help eliminate non-genuine and duplicate job cards.

17.36. Complementing social audit will be audit by the Comptroller and Auditor General (CAG). All expenditure on all schemes of the Ministries of Rural Development and Drinking Water Supply and Sanitation have now been opened up to audit by the C&AG both at the Centre and in the States. This will be irrespective of the implementing agency and will include not only financial audit and compliance audit but also performance audits with regard to these schemes. To begin with performance audits of MGNREGA will be taken up in 12 States—Assam, Andhra Pradesh, Bihar, Chhattisgarh, West Bengal, Jharkhand, Madhya Pradesh, Rajasthan, Gujarat, Maharashtra, Orissa and Uttar Pradesh.

17.37. All States will also make an arrangement for a three-tier vigilance mechanism to proactively detect irregularities in the implementation of the Act and to follow up detected irregularities and malfeasance, including those identified during social audit, and ensure that the guilty are punished and recoveries of misspent funds duly made. At the State level there will be a Vigilance Cell consisting of a Chief Vigilance Officer who could be either a senior Government officer or a retired officer supported by at least two senior officials (serving or retired), one engineer and an auditor.

17.38. Elaborate steps to institute transparency, proactive disclosure and grievance redressal have also been put into place under MGNREGA 2.0. It has also been decided that the following will be considered offences punishable under Section 25 of the Act:

- Job cards found in the possession of any Panchayat or MGNREGA functionary
- Missing entries or delay in entries in the Job Card
- Refusal to accept applications and provide dated receipts
- Unreasonable delays in measurement of works
- Unreasonable delays in payment of wages
- Failure to dispose of complaints within seven days

17.39. Limitations have also been imposed on administrative expenses, which form a maximum of 6 per cent of expenses under MGNREGA. At least two-thirds of the expenses admissible under this head will be spent at the block level and below. The following items shall under no condition be booked under the administrative costs of MGNREGA:

- New vehicles
- New buildings
- Air-conditioners
- Salaries/remuneration/honoraria of functionaries who are not exclusively or wholly dedicated to MGNREGA work

NATIONAL RURAL LIVELIHOODS MISSION (NRLM-AAJEEVIKA)

17.40. Even as a reformed MGNREGA 2.0 gets underway, during the Twelfth Plan it is the NRLM that will emerge as the centrepiece of India's battle against rural poverty. NRLM has been designed to overcome the limitations of SGSY (Box 17.2). The foundation of water infrastructure and agrarian stability provided by MGNREGA will be harnessed to generate sustainable livelihoods for the poor through the NRLM, which will work simultaneously on five critical dimensions of rural livelihoods and human development:

- Strengthening the package of credit-cum-technology support to strengthen rural livelihoods

- Empowering institutions of the poor that will fundamentally alter the balance of power in rural India
- Facilitating the poor to compete on more equal terms in the market so that they can derive real benefits from the new opportunities opening up in rural India (rather than being at their receiving end)
- Improving the quality of human development programmes such as drinking water, sanitation and housing by making higher private investments possible through a credit component being added to the subsidies being currently provided
- Imparting the much needed skills to the rural population to meet the demands of both the growing rural and urban economies and ensuring placement of skilled workers in appropriate jobs

NRLM: New Directions

17.41. Phased Implementation: The SGSY experience is yet another instance of the 'universalisation without quality' syndrome that has plagued many rural development initiatives in the recent past. The NRLM has been designed to be implemented in a phased manner (Table 17.6) specifically keeping this experience in mind to ensure quality of outcomes and to avoid spreading resources too thin, too quickly.

17.42. In each phase, select districts and blocks will be identified by each state for intensive implementation of NRLM activities. The 'intensive blocks' that are taken up for NRLM implementation would be provided a full complement of trained professional staff to undertake a whole range of activities under the key components of the Mission:

- Building institutions of the poor
- Promotion of financial inclusion
- Diversification and strengthening of the livelihoods of the poor
- Promotion of convergence and partnerships between institutions of the poor and the government and non-government agencies
- Promotion of skills and placement support
- Support for livelihoods and social innovations

Box 17.2 Limitations of SGSY

The SGSY was launched in 1999 by restructuring the Integrated Rural Development Program (IRDP). The cornerstone of the SGSY strategy was that the poor need to be organised and their capacities built up systematically so that they can access self-employment opportunities. In the 10 years of implementing SGSY, there is a widespread acceptance in the country of the need for poor to be organised into SHGs and SHG federations as a prerequisite for their poverty reduction.

A major problem identified by the Radhakrishna Committee on Credit Related Issues under SGSY (2009) is that most of the SHGs remain crowded in low productivity, primary sector activities. The success of the programme depended on raising their abilities to diversify into other high productive activities. Even in the better performing state of Andhra Pradesh, the income gain to a swarozgari from enterprise activities under SGSY was a mere ₹1,228 per month. The small income gain was due to low productive, traditional activities in which they were engaged and due to low absorption of technology.

The Committee argued that nearly two thirds of the total funds were given out as subsidy, thus making the whole programme subsidy-driven. The subsidy disbursed under SGSY was ₹12,900 crore, while credit mobilised was ₹27,800 crore, that is a credit-subsidy ratio of only 2.15:1, much below the target ratio of 3:1. This was partly due to the failure to strengthen the demand side by improving the capacity of the poor to absorb credit for income generating activities. But it was also due to supply side failures. Financial services did not have the systems and procedures suited to the poor.

Only 6 per cent of the total SGSY funds were utilised for training and capacity building during the past decade. Ill-trained groups under SGSY were a severe handicap in moving towards the Eleventh Plan goal of inclusive growth. Training is of vital importance in the management aspects of running both SHGs and their federations, as well as in improving existing livelihood options and also adopting new ones. It is very important to recognise as argued by the Radhakrishna Committee 'that prior to SHG-Bank Linkage, substantial preparatory work needs to be done for bringing the poor together through a process of social mobilisation, formation of sustainable SHGs and training them to pool their individual savings into a common pool for lending it among the needy. It also includes equipping them with skills to manage corpus fund created with their own savings, interest earned from lending and revolving fund contributed by the government'.

Another defining feature of SGSY was the very uneven distribution of SHGs across regions, with the southern states, which account for 11 per cent of the rural poor having 33 per cent of the SHGs, while the northern and north-eastern States, which account for more than 60 per cent of the rural poor having only about 39 per cent SHGs.

It was in the backdrop of these limitations of the SGSY that the Government of India approved restructuring of SGSY as the National Rural Livelihoods Mission (NRLM) and launched the same in June 2011.

17.43. The rationale behind adopting a phased, intensive approach is as follows:

- Building sustainable institutions of the poor, promotion of financial literacy and inclusion through bank linkage and provision of livelihood support services, skill development and placement, involves intensive social mobilisation effort and capacity building.
- All these activities also require a good deal of professional support. While the NRLM envisages hiring of services of competent professionals, most of the States do not have the required capacity, which can only be built in a phased manner.
- In the long run, institutions of the poor can be sustained only if leaders from the poor communities are identified, trained and prepared for undertaking larger leadership roles. The process of building local community leaders and resource persons is by its very nature time-consuming.
- Promotion of livelihoods of the rural poor does not afford a simple linear solution which all States and districts can equally adopt. What works in one state/district may not work equally effectively in another. It is only from learning by doing and innovating that appropriate solutions can emerge, as amply demonstrated by the successful phased expansion adopted in the states of Andhra Pradesh, Kerala and Tamil Nadu.
- The phased expansion approach will also facilitate early piloting of key strategies in certain 'resource blocks' which can then provide the 'proof of concept' required on the ground for others to adopt and replicate.

TABLE 17.6
Phasing of the National Rural Livelihoods Mission

	2012–13	2013–14	2014–15	2015–16	2016–17	Total Twelfth Plan	Total 13th Plan	Total
Intensive Districts	150	0	150	0	300	600	0	600
Cumulative Intensive Districts	150	150	300	300	600	600	600	600
Intensive Blocks	600	0	1,500	0	2,100	4,200	1,800	6,000
Cumulative Intensive Blocks	600	600	2100	2,100	4,200	4,200	6,000	6,000
Households Covered in Lakh	45	23	60	75	128	330	570	900
Cumulative Households Covered in Lakh	45	68	128	203	330	330	900	900
SHGs in '000	360	180	480	600	1,020	2,640	4,560	7,200
Cumulative SHGs in '000	360	540	1,020	1,620	2,640	2,640	7,200	7,200
Youth Skilled for and Placed in Jobs in Lakh	5	10	25	30	30	100	150	250
Cumulative Youth Skilled for and Placed in Jobs in Lakh	5	15	40	70	100	100	250	250
Self-employed in Lakh	2	4	6	8	10	30	60	90
Cumulative Self-employed in Lakh	2	6	12	20	30	30	90	90

Note: The figures for 2012–13 include figures of already existing SHGs.

- The community-based institutions also require certain amount of time to internalise new learning, practices and innovative experiments, before expanding and scaling up.
- Simultaneous implementation of the intensive strategy in all blocks and districts would imply a thin distribution of available resources leading to sub-optimal and non-sustainable outcomes. The phased approach will enable States to apply scarce resources to their priority districts and blocks, where strong civil society support may also be available.

Block Level Professional Support

17.44. The lack of quality in SGSY outcomes had a great deal to do with absence of high quality professional support at the block and sub-block level for undertaking intensive social mobilisation, institution building, capacity building, financial inclusion and promotion of multiple livelihoods of the poor. Under NRLM a special provision will be made for this and the professional support costs incurred at the block/sub-block levels will be treated as costs of institution and capacity building and not as administrative

costs. In the phased approach adopted under NRLM, the block-level professionals will move from one block to another after promoting and nurturing community institutions of the poor for a certain period. Gradually, the trained community resource persons (CRPs) would take over the responsibility of the institutions from the professional staff, whose costs would be progressively absorbed by the institutions as they grow financially stronger. The professional support costs of NRLM will progressively diminish with the increase in the use of CRPs.

Skill Development and Placement in Jobs

17.45. A major focus of the NRLM is skilling rural poor youth. This is both for self-employment in microenterprises and job placement given emerging widespread employment opportunities at the entry level in high growth sectors like textiles, construction, hospitality, retail, security, automobile, health, services and so on. The services provided by NRLM in the 'jobs' sub-component will include:

- Mapping the demand for jobs;
- Skill development/training;

- Counselling youth by matching their aspirations and existing skill set with demand;
- Placement and post-placement support.

17.46. NRLM will aim at supporting 1 crore youth in the Twelfth Plan in this manner. The focus will be on youth from IAP districts, J&K, North Eastern States, districts/blocks with high SC population and minority concentrated districts. The initiative will also aim at enrolling as many girls as possible.

17.47. The self-employment and microenterprises sub-component would pursue multiple streams:

- Micro-entrepreneurs and enterprises directly nurtured by Rural Development and Self-Employment Training Institutes (RUDSETIs)
- Micro-entrepreneurs through apprenticeship and nurturing by practicing micro-entrepreneurs (as under Kudumbasree in Kerala)
- Working with other training partners, including CBOs, CSOs and so on

17.48. These models envisage transforming unemployed youth into confident self-employed entrepreneurs through a short duration experiential learning program followed by systematic long duration hand holding support/ apprenticeship. In the Twelfth Plan it is proposed to nurture 30 lakh entrepreneurs from among the poor to set up micro-enterprises.

RURAL DRINKING WATER AND SANITATION

Review of National Rural Drinking Water Programme (NRDWP)

17.49. As against the target of 7,98,967 habitations for coverage under NRDWP during the Eleventh Plan, the coverage up to 31 March 2012 was 6,65,034 (83 per cent). States of Jharkhand, Chhattisgarh, Nagaland, Madhya Pradesh, Odisha, Himachal Pradesh and Tamil Nadu have exceeded their targets, whereas Sikkim, Punjab, Assam, Arunachal Pradesh and Jammu & Kashmir have reported low (less than 50 per cent) achievement against targets. As against the planned Central outlay of ₹39,300 crore in the Eleventh Plan the anticipated expenditure is ₹39,211 crore. In addition, the States are expected to spend

₹49,000 crore. The investments in rural drinking water (1951–2012) are given in Table 17.7.

TABLE 17.7
Investments in Rural Drinking Water, 1951–2012

Plan Period	Investment made (₹crore)	
	Centre	State
First (1951–56)	0	3
Second (1956–61)	0	30
Third (1961–66)	0	48
Fourth (1969–74)	34	208
Fifth (1974–79)	157	348
Sixth (1980–85)	895	1,530
Seventh (1985–90)	1,906	2,471
Eighth (1992–97)	4,140	5,084
Ninth (1997–2002)	8,455	10,773
Tenth (2002–07)	16,254	15,102
Eleventh (2007–12)	39,211	49,000

17.50. The difficulty has been that even as coverage becomes universal, there is a growing problem of 'slipback', with habitations suffering a fall in the water table and water quality, especially given the growing dependence on groundwater. Water quality has emerged as a growing concern, chemically due to geogenic leaching (arsenic and fluoride) and biologically due to bacteriological contamination. The fact that the same aquifer is being tapped for both irrigation and drinking water, without any coordinated management of the resource, has greatly aggravated availability of drinking water. Lack of convergence with sanitation, on the other hand, compromises water quality, even as it makes provision of improved sanitation difficult.

17.51. Poor operation and maintenance has resulted in high rates of attrition and dilapidated facilities. This has happened mainly because primary stakeholders do not feel a sense of ownership over the facility created and in the absence of sufficient support structures and professional capacities, upkeep suffers. On the other hand, where people have been centrally involved, they have both paid for the service provided and felt a stake in maintaining the assets, garnering adequate support for the same

through the revenues generated. There are also disturbing reports about social exclusion, with SCs, STs and minorities being discriminated against. Keeping this in mind, from 2011–12, earmarking of funds for expenditure under the SCSP (22 per cent) and the TSP (10 per cent) has been made mandatory under NRDWP. Appropriate use of IMIS and GIS maps in the planning process is being promoted to prevent social exclusion. Provision of drinking water in minority concentrated districts is one of the activities monitored under the Prime Minister's New 15 Point Programme. Implementation of rural water supply schemes is being closely monitored in the 90 minority concentrated districts.

NRDWP in the Twelfth Plan

17.52. Based on this analysis of what is going wrong with NRDWP and drawing upon some successes, the Twelfth Plan envisages a major change in the way NRDWP projects are to be run:

- While the ultimate goal is to provide households with safe piped drinking water supply at the rate of 70 lpcd, considering that 40 lpcd has been the norm over the last 40 years and there is still a large population uncovered with this level, as an interim measure the goal has been kept at 55 lpcd for the Twelfth Plan.
- By 2017, it is targeted that at least 50 per cent of rural population in the country (as against 35 per cent today) will have access to 40 lpcd piped water supply within their household premises or within 100 metres radius (and within 10 metres elevation in hilly areas) from their households without barriers of social or financial discrimination. Individual States can adopt higher quantity norms.
- By 2017, it is targeted that at least 35 per cent of rural population have individual household connections (as against 13 per cent today).
- Convergence between drinking water supply and sanitation will be strengthened taking up villages covered with piped water supply to get open defecation free (ODF) status on priority and vice versa.
- A part of NRDWP outlay will be set apart for integrated Habitat Improvement Projects to provide housing, water and sanitation facilities in rural areas at par with urban areas.
- Participation of the beneficiaries, especially women, in water supply schemes will be ensured right from the conceptualisation and planning stage, spanning construction and post-scheme completion management stages. Capacity building of members of the Village Water and Sanitation Committees is of critical importance here.
- The subsidiarity principle will be followed and decisions made at the lowest level possible especially on issues like location, implementation, sustainability, O&M and management of water supply schemes, while retaining an umbrella role for the Gram Panchayats for effective implementation.
- The Ministry of Drinking Water and Sanitation has devised a Management Devolution Index (MDI) to track and incentivise more substantive devolution of functions, funds and functionaries to the Gram Panchayats. While allocating resources across States, 10 per cent weight is given to the population of GPs to whom drinking water supply schemes have been devolved weighted by the MDI for the State.
- The weakest aspect of rural water supply is Operation and Maintenance. Allocation for O&M has been increased from 10 per cent of NRDWP allocation at present to 15 per cent in the Twelfth Plan.
- All new drinking water supply schemes will be designed, estimated and implemented to take into account life cycle costs and not just per capita capital costs.
- All Government schools and anganwadis (in Government or community buildings) will be provided with water supply for drinking and for toilets as per relevant quantity norms by convergence of NRDWP for existing schools and SSA for new schools set up under SSA. For private schools, supply of water will be ensured by enforcement of the provisions of the Right to Education Act by the Education Department.
- All community toilets built with public funds and maintained for public use will be provided with running water supply under NRDWP.
- Solar powered pumps will be provided for implementation in remote, small habitations and those with irregular power supply, especially in IAP

districts, by converging subsidy available under Ministry of New and Renewable Energy.

- Waste water treatment and recycling will be an integral part of every water supply plan or project. Management of liquid and solid waste will be promoted together with recycling and reuse of grey water for agriculture and groundwater recharge and pollution control. This will be done on priority in NGP villages.
- A holistic aquifer and surface water management approach with active community and PRI participation will converge in a District Water Vision that includes monitoring and recording of groundwater levels and rainfall at sub-block level and Aquifer Management Plans to protect and recharge drinking water sources.
- Care will be taken to ensure that minimum distance is maintained between the toilet systems and water sources, to alleviate the problem of nitrate contamination.
- Mining activity should only be carried out at a safe distance from major drinking water sources to protect the quality and sustainability of the source.
- A progressive tariff with different pricing tiers for different uses and different classes of consumers can be considered at various administrative levels, that is, the Gram Panchayat, district and State as appropriate. Incentives may be provided to the GPs for collecting user charges from the beneficiaries. A minimum collection of 50 per cent of O&M cost (including electricity charges) through user charges will be the target.
- Given the growing importance of water quality issues, dedicated funding will be provided to States with quality affected habitations, over and above the normal NRDWP allocation to the State. Within this dedicated funding highest priority will be given to arsenic and fluoride affected habitations. Part of the funding would also be made available to tackle bacteriological contamination in the priority districts with high incidence of JE/AES cases as identified by the Ministry of Health and Family Welfare.

REVIEW OF TOTAL SANITATION CAMPAIGN (TSC)

17.53. The TSC was launched in 1999 as a demand-driven, community-led programme with major IEC

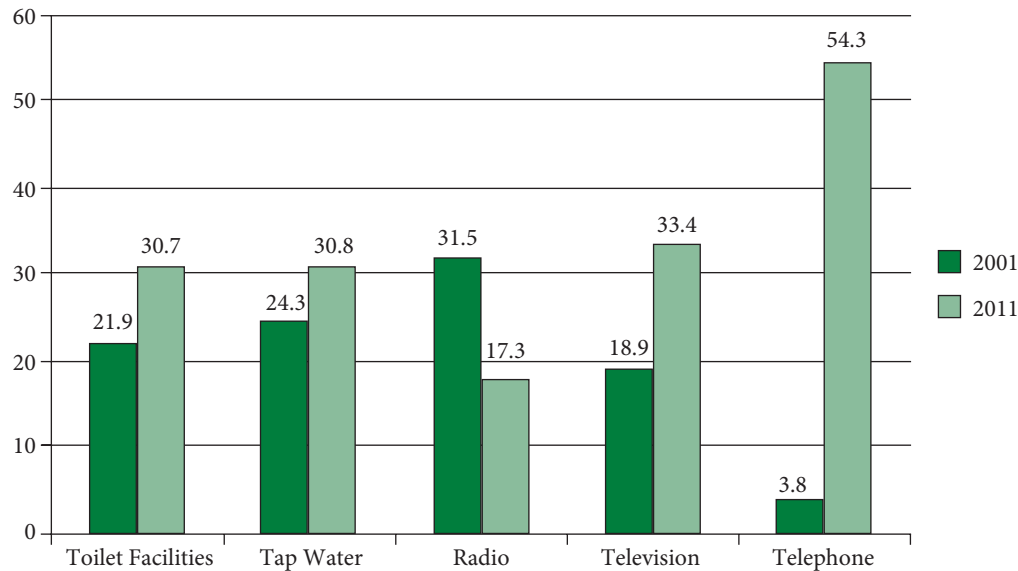
inputs to make sanitation a felt need of the people. The TSC has been able to accelerate sanitation coverage from 22 per cent as per the 2001 Census to 31 per cent in 2011, with over 28,000 PRIs becoming 'Open Defecation Free' (ODF). TSC received a major boost during the later half of the decade, with the introduction of the Nirmal Gram Puraskar (NGP) in 2005, an innovative incentive scheme for Gram Panchayats, blocks and districts, that have attained 100 per cent sanitation coverage.

17.54. However, progress remains far from satisfactory. Open defecation by around 600 million people is our biggest national shame. Since drinking water and sanitation continue to be treated in separate silos, both the quality of drinking water and that of sanitation gets compromised. Latest Census data reveals that the percentage of households having access to television and telephones in rural India in 2011 exceeds the percentage of households having access to toilet facilities and tap water (Figure 17.1).

17.55. Access to household amenities in ten worst performing States in terms of toilet facilities in rural India in the year 2011 (percentage of rural households) is given in Table 17.8.

17.56. The households by type of latrine facility in rural India as per Census 2001 and Census 2011 are given in Figures 17.2 and 17.3, respectively. The percentage of households with no latrine facilities in rural India in 2011; physical progress and financial progress during the Eleventh Plan of Total Sanitation Campaign are given in Table 17.9, Table 17.10 and Table 17.11, respectively.

17.57. Several independent assessments signal the need for a radical change in approach. The WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation estimates that in 2008 around 638 million people in India still defecated in the open and the reported usage of sanitation facilities at 30.7 per cent against the TSC sanitation coverage figure of 57 per cent for the same year. The JMP also revealed that 58 per cent of the world's population defecating in the open in 2008 was in India. A recent impact study by the World Bank's Water



Source: Census of India, 2001 and 2011.

FIGURE 17.1: Access to Household Amenities in Rural India (2001 to 2011)

TABLE 17.8
Access to Household Amenities in Worst Performing States in Terms of Toilet Facilities in Rural India, 2011
(Percentage of Rural Households)

Rank (worst as 1)	State	Toilet Facilities	Tap Water	Radio	Television	Telephone
1	Jharkhand	7.6	3.7	17.3	13.7	38.7
2	Madhya Pradesh	13.1	9.9	13	18.6	36.4
3	Odisha	14.1	7.5	10.6	19.4	33.6
4	Chhattisgarh	14.5	8.8	9.5	21.1	21.2
5	Bihar	17.6	2.6	25.8	10.2	53.5
6	Rajasthan	19.6	26.9	13.9	25.6	66.2
7	Uttar Pradesh	21.8	20.2	25	23.5	63.6
8	Tamil Nadu	23.2	79.3	18.7	85.3	66.3
9	Karnataka	28.4	56.4	17.6	46.3	62.6
10	Andhra Pradesh	32.2	63.4	6.1	49.3	54.8

Source: Census of India, 2011.

and Sanitation Programme in five States reveals that only 67 per cent of the toilets even in NGP villages were being used, while this percentage fell to just 46 per cent in non-NGP villages. A study, supported by UNICEF in 2008 revealed that in 56 per cent of NGP Gram Panchayats 70 per cent families were still defecating in the open and only 6 of the 162 NGPs had been able to sustain the NGP status. In a study for the Ministry of Drinking Water and Sanitation, the Centre for Media Studies (2010) found that the key factors explaining the gap between access to and

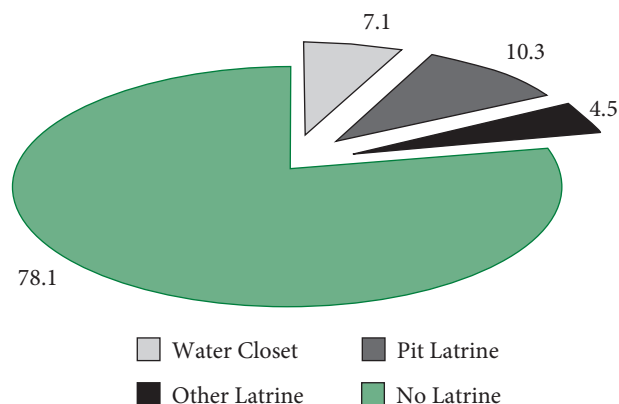
usage of sanitation facilities were poor quality of construction and unfinished toilets, a major reason for which was the very low incentive provided under the TSC.

17.58. The Twelfth Plan Working Group is of the clear view that the APL–BPL distinction and the very low incentive under the TSC have played havoc with the programme. Many slip-backs in the NGP villages have been attributed to non-availability of water, clearly indicating need to synergise the drinking

TABLE 17.9
Percentage of Households with No Latrine Facilities in Rural India, 2011

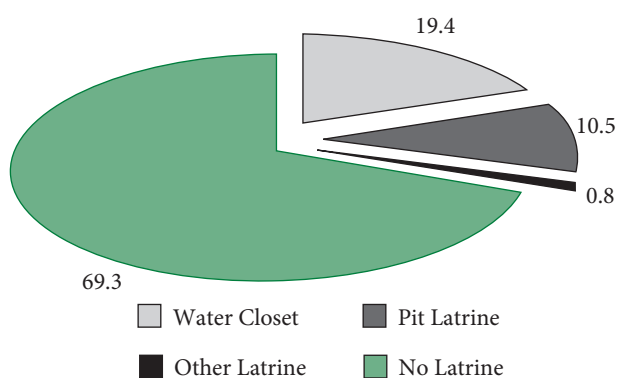
State	2011	2001
Jharkhand	92.4	93.4
Madhya Pradesh	86.9	91.1
Odisha	85.9	92.3
Chhattisgarh	85.5	94.8
Bihar	82.4	86.1
Rajasthan	80.4	85.4
UP	78.2	80.8
Tamil Nadu	76.8	85.6
D&N Haveli	73.5	82.7
Karnataka	71.6	82.6
Andhra Pradesh	67.8	81.9
Gujarat	67	78.3
Maharashtra	62	81.8
J&K	61.4	58.2
Puducherry	61	78.6
West Bengal	53.3	73.1
Daman & Diu	48.6	68
Arunachal Pradesh	47.3	52.7
Meghalaya	46.2	59.9
Uttarakhand	45.9	68.4
Haryana	43.9	71.3
Assam	40.5	40.4
A&N Islands	39.8	57.7
HP	33.4	72.3
Nagaland	30.8	35.4
Punjab	29.6	59.1
Goa	29.1	51.8
NCT of Delhi	23.7	37.1
Tripura	18.5	22.1
Sikkim	15.9	40.6
Mizoram	15.4	20.3
Manipur	14	22.5
Chandigarh	12	31.5
Kerala	6.8	18.7
Lakshadweep	2	6.9
India	69.2	78.1

Source: Census of India, 2011.



Source: Census of India, 2001.

FIGURE 17.2: Households by Type of Latrine Facility in Rural India in 2001



Source: Census of India, 2011.

FIGURE 17.3: Households by Type of Latrine Facility in Rural India in 2011

water and sanitation programmes. One of the limitations of the TSC is the narrow range of technology options offered in a country with such immensely diverse geographic, hydrologic, climatic and socio-economic conditions (high water table, flood prone, rocky ground, desert/water scarce areas and extreme low temperatures). This has led to many problems, including non-acceptance by local communities, water pollution especially in shallow water table regions, and waste of public funds. There is need to broaden the ranges of models permissible under TSC. Finally, the absence of a dedicated implementation agency at either the State/district or GP level, to implement TSC has emerged as a major bottleneck affecting quality of outcomes.

TABLE 17.10
Total Sanitation Campaign, Physical Progress, Eleventh Plan

Financial Year	IHHL BPL	IHHL APL	Total IHHL	School Toilets	Sanitary Complexes	Anganwadi Toilets
2007–2008	57,63,430	57,64,460	1,15,27,890	2,36,259	3,006	86,489
2008–2009	55,70,899	56,94,983	1,12,65,882	2,53,004	3,245	68,995
2009–2010	58,69,608	65,38,170	1,24,07,778	1,44,480	2,230	66,227
2010–2011	61,55,933	60,87,798	1,22,43,731	1,05,509	3,377	50,823
2011–2012	47,34,816	40,64,048	87,98,864	1,22,471	2,547	28,409

TABLE 17.11
Total Sanitation Campaign, Financial Progress, Eleventh Plan

Financial year	Total outlay (₹ in crore)	Total expenditure (₹ in crore)
2007–08	1,060	996
2008–09	1,200	1,193
2009–10	1,200	1,200
2010–11	1,580	1,580
2011–12	1,500	1,500
Total (in crore)	6,540	6,469

Total Sanitation Campaign in the Twelfth Plan 17.59. The Twelfth Plan visualises a major break from the past under TSC:

- The goal of the Twelfth Plan will be that 50 per cent of the Gram Panchayats attain Nirmal Gram status by the year 2017.
- The APL–BPL distinction and the focus on individual toilets are to be replaced by a habitation saturation approach. Rechristened the Nirmal Bharat Abhiyan (NBA), the programme will cover SC, ST, physically handicapped, small and

marginal farmers and woman-headed households in each habitation.

- The idea is not to sacrifice quality and sustainability of outcomes in the mad rush to attain targets, even if this means moving somewhat slower in reaching universal coverage.
- Through a convergence with MGNREGA, the unit cost of individual household latrines will rise to ₹10,000 as described in Table 17.12.
- Toilet designs will be fine-tuned in accordance with local social and ecological considerations.
- There will be a specific provision for capacity building at a rate not exceeding 2 per cent of district project outlay.
- In order to focus more centrally on sustainability of outcomes, the programme shall be taken up in a phased manner wherein GPs shall be identified, based on defined criteria of conjoint approach to sanitation and water supply, for achievement of NGP status. This would progressively lead to Nirmal blocks, Nirmal districts and eventually Nirmal States. The pattern of fund release will be tweaked with flexibility to the districts to prioritise funding to GPs identified for Nirmal Grams. Thus, Nirmal Grams with full access and usage of toilets, water availability and systems of

TABLE 17.12
Major Increase in Unit Cost Support for IHHLs during the Twelfth Plan

IHHL	Centre	State	Beneficiary	Total TSC	MGNREGA	Total
Total Cost (₹)	3,200	1,400	900	5,500	4,500	10,000
Labour Cost (₹)				0	2,700	2,700
Material Cost (₹)				5,500	1,800	7,300
Labour: Material Cost				0:100	60:40	27:73

waste disposal and drainage, shall be the outcome of NBA.

- A new strategy will be devised to facilitate convergence between drinking water and sanitation projects. NBA will give priority to coverage of areas with functional piped water supply systems (PWSS), followed by areas with ongoing PWSS that are nearest to completion. Next, new PWSS will be taken up in GPs of districts where IHHL coverage has reached higher milestones of coverage in a descending order. In all such new and ongoing PWSS, NBA should be implemented simultaneously with the planning and execution of PWSS to ensure that behavioural change for usage of toilets is generated. Care will be taken that PWSS are planned and executed covering entire habitations on a saturation basis, so that health and other impacts of safe water and sanitation are clearly discernable.
- Running water availability must also be ensured in all Government school toilets, anganwadi toilets and Community Sanitary Complexes under NRDWP.
- Child-friendly toilets will be developed in anganwadis and schools. This will be accompanied by capacity building of school teachers, ASHA and anganwadi workers and ANMs among others on hygiene and sanitation. Sanitation will be made a part of the school curriculum so that safe sanitation practices are ingrained in the minds of children who would be the torch bearers of sanitation in their households and the community.
- In order to ensure smooth O&M of toilets, a massive training campaign will be launched in convergence with the National Rural Livelihoods Mission in skills such as masonry work, brick-making, toilet pan making and plumbing. 'Nirmiti Kendras' will be set up for development and manufacture of cost-effective construction materials. The existing Production Centres and Rural Sanitary Marts will also be revitalised and appropriate SHGs entrusted with this task.
- Effective hand-holding with adequate IEC must continue for a period of time even after construction to ensure sustainability of outcomes. Comprehensive region-specific communication and information strategy will be deployed for

demand generation and sustainability. Office-bearers and members of GPs, VWSCs, BRCs, SHGs, Swachhata doots, women and youth groups, school committees, and so on will be involved in dissemination of information and effective communication. NGOs and CBOs of repute may be engaged for maximum results for individual contact, motivation and implementation. Key Resource Centres must also be identified within State/district for training of State/district level functionaries in IEC.

- NBA will be implemented at the GP level through VWSCs who could receive technical support from NGOs/CBOs identified by the District authorities. The VWSC must be mandatorily made a Standing Committee of the GP to ensure community participation in planning, construction, operation and management with the GP providing overall guidance to the VWSCs. A sense of ownership will be created through owner-driven construction through self labour and hiring of skilled labour.
- Solid and liquid waste management will be taken up in Nirmal Grams on a priority basis for which an assistance of ₹5,00,000 will be additionally available per 1,000 people from the redesigned MGNREGA 2.0.

17.60. Justification for the huge jump in outlays for sanitation and drinking water is provided by recent scholarly work on the relationship between sanitation and health. A recent article in *Lancet*² suggests that the impact of sanitation and hygiene interventions on child under-nutrition has been seriously undervalued in the existing research as this effect has been modelled entirely through diarrhoea. The study argues that a key cause of child under-nutrition is a subclinical disorder of the small intestine known as tropical enteropathy. This is caused by faecal bacteria ingested in large quantities by young children living in conditions of poor sanitation and hygiene. The study finds that provision of toilets and promotion of hand-washing after faecal contact could reduce or prevent tropical enteropathy and its adverse effects on growth; and that the primary causal pathway from poor sanitation and hygiene to under-nutrition is tropical enteropathy and not diarrhoea. Though based on field studies conducted

in Africa, This study has important policy implications for India. Accelerating provision of toilets and improved drinking water quality will prevent tropical enteropathy, which in turn will yield improvements in child growth, health and survival.

17.61. A study of the TSC completed in July 2012,³ finds that at mean program intensity, infant mortality decreased by four per thousand and children's height increased by 0.2 standard deviations. Relative to other children born in the same districts or in the same years, rural children exposed to better sanitation in their first year of life were more likely to survive infancy. Districts in which more latrines were constructed over this period saw a greater decline in rural infant mortality rates, controlling for other changes. Rural children born in years and districts with more TSC latrines available in the first year of their lives are taller than children born in other years or districts.

RURAL HOUSING

17.62. Allied to these initiatives on rural livelihoods, are significant steps towards improving basic amenities in rural India, the most important of which is housing. Under the Indira Awaas Yojana (IAY), since 1985, nearly 285 lakh houses have been constructed with an expenditure of about ₹84,234 crore.

IAY during the Eleventh Plan Period

17.63. The summary of the financial and physical progress of IAY during the Eleventh Plan period is given in Tables 17.13 and 17.14.

TABLE 17.13
IAY-Financial Performance during Eleventh Plan
(2007-08 to 2011-12)

Year	Total Available Fund* (₹crore)	Utilisation (₹crore)
2007-2008	6,527.17	5,464.54 (83.72)
2008-2009	14,460.35	8,348.34 (57.73)
2009-2010	15,852.35	13,292.46 (83.85)
2010-2011	17,956.54	13,465.73 (74.99)
2011-2012	18,982.69	12,451.12 (65.59)

Notes: (i) *Includes Opening Balance and Centre and State Releases.

(ii) Figures in the parentheses are per cent utilisation to total available fund.

TABLE 17.14
Physical Performance of IAY During Eleventh Plan
(2007-08 to 2011-12)

Year	IAY Houses (in lakh)	
	Target	Constructed
2007-2008	21.27	19.92 (93.66)
2008-2009	21.27	21.34 (100.32)
2009-2010	40.52	33.85 (83.55)
2010-2011	29.09	27.15 (93.36)
2011-2012	27.27	22.30 (81.80)

Note: Figures in the parentheses are per cent achievement of total target.

17.64. Over the years, there have been important revisions in the scheme and related institutional processes for making IAY accessible to the poorest in rural India:

1. IAY waitlists have been prepared Gram Panchayat-wise by the States/UTs on the basis of their housing and poverty status as per the BPL list. In order to introduce transparency in the selection of beneficiaries, permanent waitlists are supposed to be displayed in all Gram Panchayats.
2. IAY houses are allotted (in this order of preference) in the name of the woman or jointly between the husband and the wife.
3. Financial assistance provided under IAY was raised twice during the Eleventh Plan, on 1 April 2008 from ₹25,000 in plain areas and ₹27,500 for hilly/difficult areas to ₹35,000 and ₹37,500 respectively and to ₹45,000 in plain areas and ₹48,500 in hilly/difficult areas on 1 April 2010. The higher assistance is also provided to districts under the Integrated Action Plan (IAP) for select backward and tribal districts. IAY beneficiaries are also covered under the Differential Rate of Interest (DRI) scheme for lending up to ₹20,000 per housing unit at 4 per cent interest.
4. Sanitary latrine and smokeless chullah are required to be constructed along with each IAY house. For construction of the sanitary latrine, financial assistance is made available from the Total Sanitation Campaign (TSC) funds in addition to IAY assistance.
5. There is a provision for making available home-stead sites to those rural BPL households whose

names are included in the permanent IAY wait-lists but do not have a house site. ₹10,000 per homestead site is currently provided, this funding being equally shared by the Centre and the States. States are also incentivised by allocating additional IAY houses equal to the number of homestead sites provided through any of the stipulated means—regularisation of existing occupied land, allotment of government land or purchase/acquisition of land. If the amount per beneficiary falls short, the balance amount is contributed by the State Government. BPL families allotted land through purchase are, to

the extent feasible, provided assistance for house construction in the same year.

17.65. Progress on some of these innovative features has been slow. For instance, Table 17.15 shows that the drive towards convergence with other rural infrastructure schemes has not been up to the mark.

17.66. Again, only a few States such as Bihar, Karnataka, Kerala, Rajasthan, Andhra Pradesh, Maharashtra, UP and Sikkim have so far requested for funds for purchase of homestead land under this scheme. Progress is summarised in Table 17.16.

TABLE 17.15
Convergence of IAY with other Rural Infrastructure

S. No.	Convergence (per cent of IAY houses)							
	Period	TSC	Smokeless Chullahs	Bio-Gas Plant	RGGVY	Kitchen Garden	Life Insurance Scheme	Health Insurance Scheme
1	2008-09	5.91	5.17	0.00	0.11	0.29	0.74	0.29
2	2009-10	26.50	22.70	0.12	0.65	0.64	4.21	1.00
3	2010-11	26.85	24.05	0.07	1.10	0.95	6.18	2.07

TABLE 17.16
Scheme for Purchase of Home Site and Incentive for Additional Target under IAY

S. No.	State/UT	2009-10			2010-11		
		Purchase of Homesite		Incentive	Purchase of Homesite		Incentive
		Amount Released (₹ Lakh)	No. of Sites to be Purchased	Additional Houses Sanctioned	Amount Released (₹ Lakh)	No. of Sites to be Purchased	Additional Houses Sanctioned
1	Andhra Pradesh				10,228	2,04,568	
2	Bihar	5,334	1,06,674				
3	Gujarat			33,154			18,342
4	Karnataka	5,400	1,08,000		6,082	1,21,634	31,806
5	Kerala	3,209	64,189				
6	Madhya Pradesh						1,05,200
7	Maharashtra				2,500	50,000	
8	Rajasthan	1,721	34,412				95,702
9	Sikkim	83	1,666				
10	Tripura						15,050
11	Uttar Pradesh				190	3,790	
	Total	15,747	3,14,941	33,154	19,000	3,79,992	2,66,100

Rural Housing through other Sources

17.67. During the Eleventh Plan period, rural housing was also facilitated by assistance from State Governments and financial institutions/banks. This has been through both supplementing IAY grant assistance as well as via State-level schemes for rural housing. For instance, Government of Kerala provides additional resources to enhance the unit cost to ₹75,000 for general category households, ₹1,00,000 for SC households as well physically and mentally handicapped persons and ₹1,25,000 for ST households and destitute families. Government of Andhra Pradesh provides additional ₹20,000 to SC/ST beneficiaries of IAY. Around 15 States/UTs have their own schemes. During the Eleventh Plan, about 30 lakh houses were constructed under various rural housing schemes of State Governments.

17.68. National Housing Bank (NHB), National Bank for Agriculture and Rural Development (NABARD) and Housing and Urban Development Corporation (HUDCO) also provide support for rural housing. The NHB is the apex financial institution for housing in the country. It runs schemes such as the Rural Housing Fund (RHF), Golden Jubilee Rural Housing Refinance Scheme (GJRHFS) and Productive Housing in Rural Areas (PHIRA). NABARD made refinancing for rural housing as an eligible activity in the year 2001–02. Under the Rural Housing Scheme, NABARD extends refinance to banks for provision of loans to individuals/cooperative housing societies. HUDCO has been supporting Housing Boards, Panchayati Raj Institutions (PRIs), Development Authorities and other para-statal by extending loan assistance for weaker sections at 8 per cent to 8.5 per cent against its borrowing rate of 10.25 per cent. Of the total 1.5 crore housing units supported by HUDCO till date, over 89 lakh units (60 per cent) have been constructed in rural areas.

Rural Housing in the Twelfth Plan

Need for Greater Financial Support

17.69. One of the major reasons for continued shelterlessness in rural India is shortage of financial resources. According to the NSSO, about 66 per cent financing of new construction in rural areas

in 2010–11 was done by rural families with their own resources; about 27 per cent construction had some amount financed from non-institutional agencies such as moneylenders, family and friends while only 9 per cent of new construction was financed by institutional channels such as Government schemes, banks and so on. A Committee constituted by the Ministry of Rural Development for formulation of Concrete Bankable Schemes for Rural Housing (2011) found that although credit flow to the housing sector witnessed a growth of about 30 per cent over the last five years, lending to rural areas grew only about 10 per cent.

17.70. Quality of housing has also suffered due to inadequate financial support. It is, therefore, proposed to increase the unit assistance for house construction under IAY to ₹65,000 in plain areas and to ₹70,000 in hilly/difficult areas during the Twelfth Plan, with an increase each year to absorb rising cost of material and labour'. Given the overall financial constraint this may lead to a slowing down of achievement of targets but a conscious decision is being taken to ensure that good quality housing becomes possible through an increase in unit cost assistance provided. At the same time, DRI loans for IAY families will be enhanced up to ₹50,000 at 4 per cent rate of interest, along with extended repayment tenure up to 15 years. Provision of DRI loans for IAY beneficiaries will be made obligatory on the part of the banks given the investment that the government commits when sanctioning an IAY house. Approval of DRI loans will be included as an indicator of financial inclusion by the banks. Banks will develop standard processes that are simple and hassle-free to enable easier access to DRI loans by beneficiaries.

Smoother Transfer of Funds

17.71. The process of fund transfer from the Centre to the States is being simplified to facilitate convergence as well as enhance effectiveness and efficiency in the implementation of various rural habitat schemes. Funds will now be released to the States through a fund to be created by the State on the lines of MGNREGA or TSC. Central releases as well as State contribution will be credited to the State

Fund and the States are expected to release funds to DRDAs on the basis of predetermined criteria as defined in the guidelines. It is expected that these modifications in the administration of the scheme would help in reaching out to the targeted population effectively and in a manner that facilitates smooth functioning across departments.

Abolition of the APL–BPL Distinction

17.72. The Socio-economic and Caste Census (SECC) will be complete in time for the Twelfth Plan implementation. This Census will provide lists of households that are homeless as well as those who live in poor quality houses. There will be no reference made to any BPL list. Assistance under IAY will be provided to these households in order of priority to be determined on the basis of the other indicators of deprivation thrown up by the SECC.

Enhancing Access of the Poor to Land

17.73. The unit cost for purchase of homestead plots under IAY will be increased to ₹20,000 on IAY assistance pattern, that is, 75:25 contributions by the Centre and the State, respectively. A dedicated officer at the district level will be designated by the state government to address various bottlenecks faced by the beneficiaries in accessing homestead sites. A cluster approach will be adopted for developing homestead lands for groups of homeless families.

Improving Quality of IAY Houses

17.74. The most important change the Twelfth Plan seeks to bring is an improvement in quality of housing. Raising the financial assistance is certainly a necessary condition for improved quality but it is not sufficient in itself. IAY guidelines recommend that State Government and implementing agencies should facilitate access to information on innovative technologies, materials, designs and methods, but most States do not have any mechanism to do so. There is a clear need for developing and popularising appropriate technology through a network of institutions, which could result in low-cost, environment-friendly and disaster-resistant houses as per local cultural preferences. Developing a menu of specific designs and technology options for each region reflecting variations in environmental and cultural conditions would be the way to go forward.

Rural Building Centres (RBCs)

17.75. RBCs at the district level could play an important role as a single window solution for guidance on quality construction, supply of alternative materials, skill building of artisans and development and dissemination of innovative, location-appropriate technologies that minimise the use of high-energy construction materials. They could also carry out special skill upgradation programmes intended to impart both skills and organisational abilities, effective monitoring of housing construction, knowledge building and awareness creation on quality and safety features

17.76. The RBCs would provide a platform for developing comprehensive knowledge and experience of application of common alternative technologies for various geo-climatic zones of India needs to be developed. A network of RBCs would serve to link research institutions with rural habitat practitioners for dissemination of technical know-how. It would also facilitate further development of knowledge on alternate materials and technologies for different geo-climatic zones.

17.77. Proven alternative technologies that are cost-effective and environment-friendly need to be included in the State Schedule of Rates. Towards this end, partnerships need to be forged by the States with specialised research and development institutions, academic institutions and NGOs that have worked on alternate technologies. For instance, the National Mission on Bamboo Applications can provide advice on treatment, use and costing of bamboo based building elements for use in areas that have bamboo in abundance and have used the material traditionally due to its appropriateness in the specific geo-climatic context.

Emphasis on Disaster Risk Reduction

17.78. Along with concerted efforts to demystify and enable access to technical knowledge and skills for good quality construction, it is important that disaster risk in various locations be considered and analysed. Technical guidelines for house construction need to be modified suitably. Under the GoI–UNDP Disaster Risk Management Programme, the Ministry of Home Affairs has developed ‘Guidelines

for Development and Building Construction including Safety Provisions for Natural Hazards in Rural Areas'. The guidelines provide detailed understanding of the role and responsibility of various institutions including PRIs for addressing disaster risk of buildings in rural areas. In addition, there is detailed guidance on construction details that can make a difference to the safety of a building. There is a need to include such considerations for reducing disaster risk of housing stock in rural India irrespective of the source of funding. There is a need to pay special attention to 'multi-hazard'-prone areas spelt out in the Vulnerability Atlas of India through incorporation of disaster resistant designs in house construction. These areas will be designated as 'difficult areas' and provided higher unit assistance under IAY. In addition, all new houses will be insured through group insurance to spread the risk of losses due to natural disasters and other calamities such as fires.

Training of Masons, Artisans and Others

17.79. A large pool of skilled workers like masons, bar benders, plumbers, carpenters and other construction-related artisans trained in safe and sustainable construction practices needs to be developed for all construction activity in the future. Five per cent of the IAY budget in the Twelfth Plan is being dedicated to capacity building of these personnel

Partnerships with Civil Society and PRIs

17.80. Given the scale of shelterlessness and the need for improving quality, it is important that local stakeholders are able to effectively participate in housing delivery. PRIs are central to effective habitat development in rural areas. They need to take a lead in micro-planning and prioritising habitat development needs. Services of trained local groups and enterprises to take up innovative implementation of housing and habitat schemes should be made available to PRIs by the State Governments. SHGs could be an important vehicle for production of building materials and provision of construction services. NGOs have been playing an important role in facilitating rural housing through promotion of innovations in architectural design, housing finance, alternative technology, supervision of construction and promotion of an eco-habitat

approach. NGOs could be professionally engaged to support PRIs to facilitate safe and sustainable habitat development.

PROVISION OF URBAN AMENITIES IN RURAL AREAS (PURA)

17.81. PURA aims to provide urban amenities and livelihood opportunities in rural areas to bridge the rural-urban divide in the Indian society. The pilot phase of PURA was implemented from 2004-05 to 2006-07, with a total budget of ₹30 crores. There were seven clusters selected in seven States, with budgets of ₹4-5 crores per cluster. The implementation of the pilot phase did not yield the desired results as it faced the following issues:

- The pilot projects lacked a detailed business plan and there was limited participation by the private sector.
- The pilot projects were predominantly infrastructure-oriented projects, with limited attention being given to the implementation of economic activities.
- The criteria for selection of the clusters did not factor the growth potential for that area.
- There was no ownership at the State Government level and the entire implementation lacked an appropriate institutional structure with dedicated professional support.
- There was no convergence with other schemes of rural development or other departments.

17.82. Given the experience of the pilot projects, a restructured PURA was launched in the Eleventh Plan as a demand-driven programme through Public-Private Partnership (PPP) between Gram Panchayats and private sector partners. Core funding is sourced from the convergence of Central Government schemes and complemented by additional support through the PURA Scheme. The private sector brings on board its share of investment besides operational expertise. The PURA Scheme is implemented and managed by the private sector on considerations of economic viability but designed in a manner whereby it is fully aligned with the overall objective of rural development. To attract the private sector, the Scheme has a 'project based' design

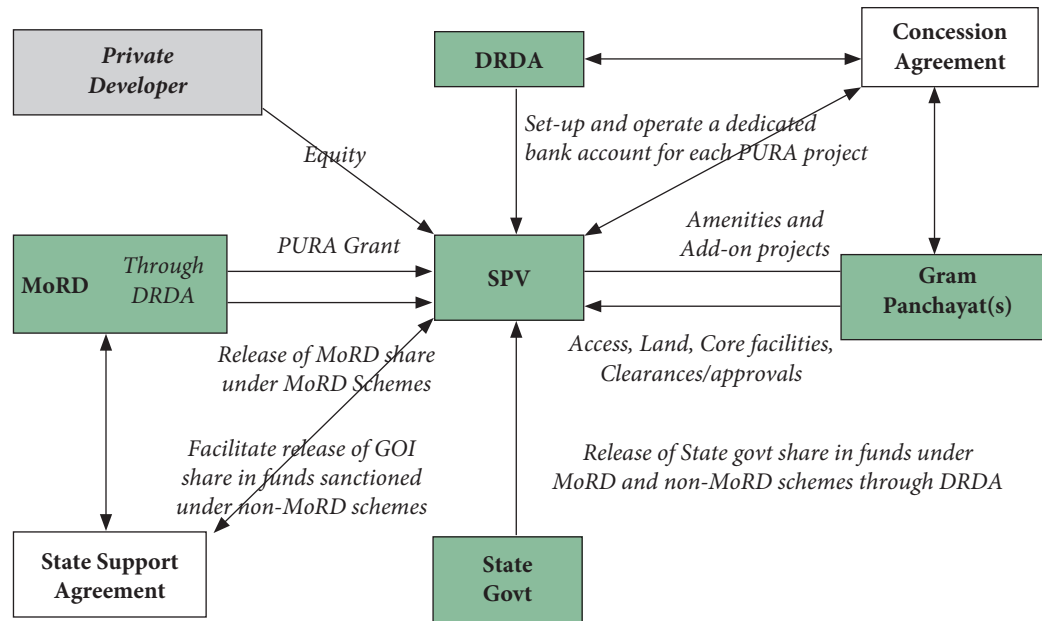


FIGURE 17.4: PURA Transaction Structure

with well-defined risks, identified measures for risk mitigation and risks sharing among the sponsoring authority (Gram Panchayat), Central Government, State Government and the selected bidder.

17.83. The transaction structure conceived to implement the project is shown in Figure 17.4.

17.84. MoRD issues Letters of Award to only those projects whose DPRs have been approved by an Inter-Ministerial Empowered Committee (EC) constituted for PURA. Post the issue of the Letter of Award, the concession and State support agreements are executed. Based on an understanding of challenges that have emerged through the brief experience of these pilot projects, the following improvements will be made in PURA going into the Twelfth Plan:

- There will be a better coordination procedure for granting the approvals to projects under non-MoRD schemes to ensure a single window clearance for the bidders. Guidelines will be issued to future bidders regarding the potential non-MoRD schemes that could be integrated within PURA projects, which could act as a useful databank for bidders.

- In many PURA projects it became evident that bidders had not adopted a consensus-building process and hence failed to incorporate many of the demands of the villagers. A proactive consensus building approach will be a basic guideline to the bidders with each step being documented. Each demand should be documented and if the same is not accommodated by the bidder, then this should be transparently shared with the primary stakeholders.
- Due to the multiple activities involved in a PURA project, the selected concessionaire is required to approach various departments within the State Government. This process can be time-consuming. Hence a project-level coordination committee must be constituted at the State Government level to grant various approvals or take decisions on the implementation challenges associated with PURA projects. An example is the committee constituted by the Government of Kerala to address issues relating to PURA projects.
- A Project Implementation Unit also needs to be established at MoRD to undertake the monitoring role for all PURA projects within the country.
- There is an imperative need for undertaking capacity-building activities for officials of Gram Panchayats and the District Administration. This

capacity-building would be aimed at providing officials with necessary skill sets to meet their obligations under the Concession Agreement and State Support Agreement. Handholding by the MoRD in the pilot phase would be required to achieve smooth implementation of the projects.

- An accurate baseline survey is crucial in determining the PURA grant for the project. The broad contents of the baseline survey needs to be provided to bidders as a standard document.
- Given the diverse backgrounds of the bidders, standard technical solutions (like sample designs of various structures) may be provided as a manual to the bidders. Such a reference document would enable standardisation of the DPRs and enable a smoother approval process for MoRD.
- A manual of various innovative cost-effective technologies may also be provided that could be adopted by the bidders in their projects.

17.85. Table 17.17 shows the infrastructure and amenities to be provided, operated and maintained under a PURA project by the private developer during the Twelfth Plan.

17.86. In order to ensure scaling of the PURA Scheme, it would necessary for State Governments to lead the entire process of managing PURA projects. The key activities would involve undertaking the procurement process for selection of private developers, facilitating/interacting with the private players in the course of preparation of Concept Plans and DPRs and undertaking its obligations under the Concession and State Support

Agreements. Further the State Governments would need to identify their nodal departments and build capacities of these nodal departments to handle PURA Projects. In addition, a funding pattern for PURA Grant in the ratio of 80:20, with 80 per cent of the funding for PURA Grant coming from MoRD and 20 per cent from the concerned State Government will be adopted. The role of MoRD will be that of a facilitator and the final approving and monitoring authority of the PURA Projects. An institutional structure on the lines of the PMGSY Scheme of the MoRD is suggested for upscaling PURA (Figure 17.5).

NATIONAL SOCIAL ASSISTANCE PROGRAMME (NSAP)

17.87. An integral element of India's battle with poverty and distress is to provide succour to senior citizens, differently abled people and others who have suffered due to mishaps in life through unconditional cash transfers. The NSAP refers to a basket of welfare schemes that provide social assistance to a wide range of people in need in both rural and urban India. At the beginning of the Eleventh Plan, the NSAP comprised the Indira Gandhi National Old Age Pension Scheme (IGNOAPS), the Annapurna Scheme and National Family Benefit Scheme (NFBS). In February 2009, two more schemes were added under NSAP—the Indira Gandhi National Widow Pension Scheme (IGNWPS) and the Indira Gandhi National Disability Pension Scheme (IGNDPS). Although they are small, these pensions have been described as a veritable lifeline for the millions of widows,

TABLE 17.17

Infrastructure and Amenities to be Provided, Operated and Maintained under PURA Project by Private Developer in the Twelfth Plan

Mandatory-under MoRD schemes	Under non-MoRD schemes as local conditions permit (Illustrative list)	Add-on projects to generate economic and livelihood opportunities* (Illustrative list)
<ul style="list-style-type: none"> • Water and sewerage • Village streets • Drainage • Solid waste management • Skill development • Development of economic activities 	<ul style="list-style-type: none"> • Village street lighting • Telecom • Electricity generation, and so on 	<ul style="list-style-type: none"> • Village linked tourism • Integrated rural hub, Rural market • Agri—common service centre and warehousing • Any other rural economy based project

*At least one such activity would be included in the project.

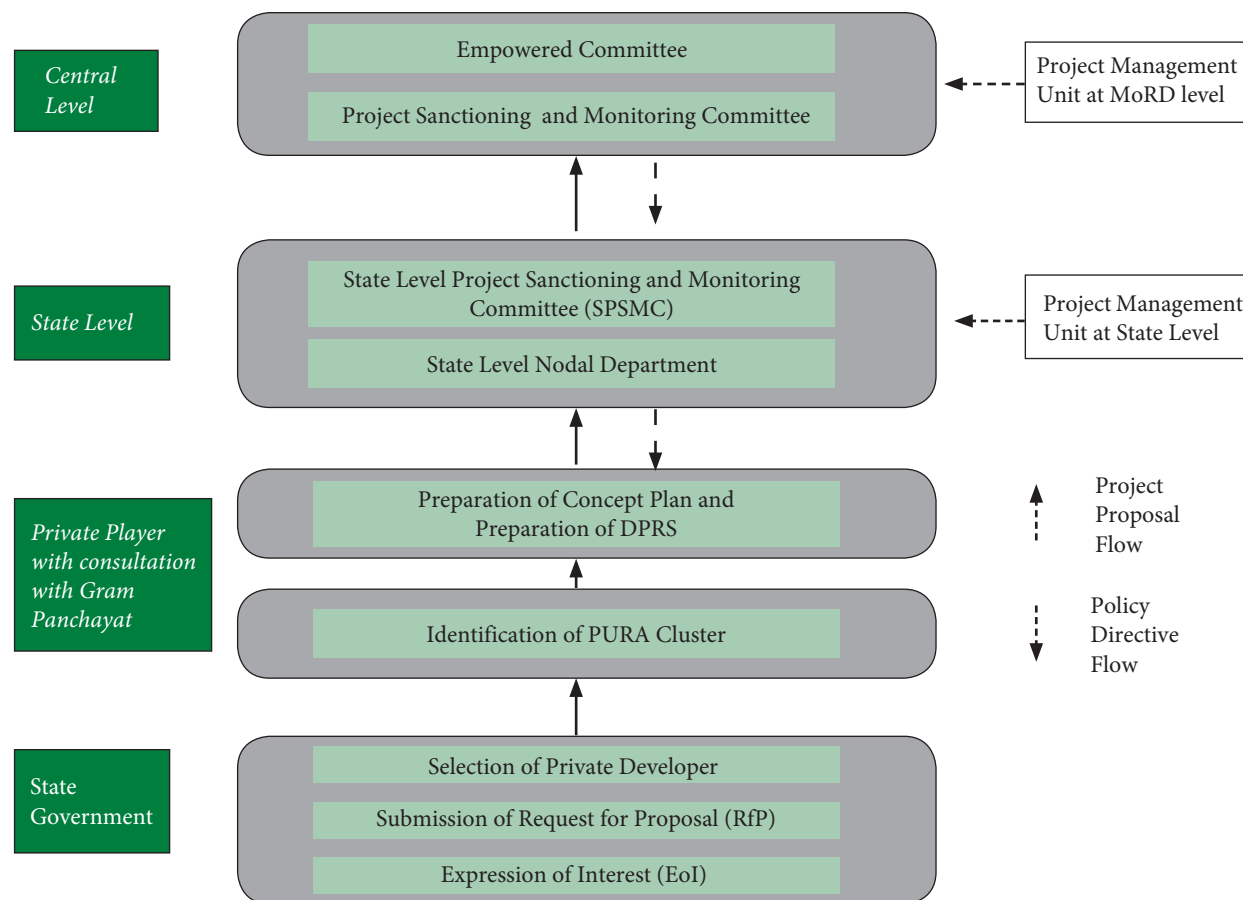


FIGURE 17.5: Institutional Structure for PURA

elderly and disabled people who receive them.⁴ NSAP allocation has increased eight-fold since 2002–03. IGNOAPS is the largest scheme within NSAP. In 2011–12, 82 per cent of the total NSAP expenditure was on IGNOAPS followed by the IGNWPS at 9.7 per cent. The physical and financial progress of NSAP during the Eleventh Plan is given in Table 17.18.

TABLE 17.18
NSAP Progress in the Eleventh Plan

Year	Expenditure Reported (₹ crore)	Beneficiaries (in lakh)
2007–08	3,110.99	128.89
2008–09	3,875.31	167.63
2009–10	4,718.83	216.06
2010–11	5,480.60	231.12
2011–12	5,121.95	253.64

17.88. While NSAP started as a Centrally Sponsored Scheme (CSS) in 1995, it was transferred to State Plans in 2002–03 and funds are now released as Additional Central Assistance to the States. Guidelines are issued by the MoRD at the Centre and the MoRD monitors expenditures under the ACA, but it is the responsibility of State Governments to identify beneficiaries, sanction benefits and disburse payments.

17.89. Under IGNOAPS, since 2006–07, old age pension of ₹200 per month was being provided to persons of 65 years and above who are destitute (BPL with effect from 19 November 2007). With effect from 1 April 2011, the age limit has been lowered to 60 years and for persons above 80 years, the pension has been enhanced to ₹500 per month. It is estimated that this change will benefit an additional 7.2 million persons in the age group of 60–64 years and 2.6 million persons above the age of 80 years.

Currently, 19 States/UTs are providing an additionality of ₹200 to ₹800 per month. Another 11 States/UTs are providing additional pension of between ₹50 to ₹200.

17.90. The NFBS provides a lump sum family benefit of ₹10,000 to the bereaved household in case of the death (natural or accidental) of the primary breadwinner (male or female) whose earnings contribute substantially to the total household income. This scheme is applicable to all the eligible persons in the age group 18 to 64. The bereaved household should belong to BPL families to qualify for this benefit. This sum has been raised to ₹20,000 with effect from 18 October 2012 with eligibility criteria of age group 18 to 59 years.

17.91. In February 2009, the IGWPS was started to provide pension to BPL widows in the age group 40–64 years at the rate of ₹200 pm per beneficiary. The estimated number of beneficiaries under Indira Gandhi National Widow Pension Scheme (IGNWPS) is 45 lakhs. IGNDPS was also started in the same month for BPL persons with severe or multiple disabilities⁵ (in the age group of 18–64 years) at the rate of ₹200 per month per beneficiary. It is estimated that 15 lakh beneficiaries will be covered under IGNDPS. As a result of change in the eligibility criteria for receiving old age pension in April 2011, eligibility criteria for widow pension under IGWPS and disability pension under IGNDPS got revised from 40–64 years to 40–59 years and from 18–64 years to 18–59 years, respectively. 36.05 lakh beneficiaries have been covered so far under IGWPS and 7.69 lakh under IGNDPS. With effect from 1 October 2012, the widow and disability pensions have been raised to ₹300 per month and eligibility criteria to age

group 40–79 years for IGWPS and 18–79 years for IGNDPS. The component-wise physical and financial progress of NSAP during the Eleventh Plan is given in Table 17.19.

17.92. NSAP faces several types of implementation challenges: logistical (application and sanctioning process, funds flow management), bureaucratic (low incentives, weak capacity), and management (MIS, reporting systems, verification). In the execution of NSAP, greater professional support is needed for ensuring quality, delivery and for suitable monitoring and evaluation, both at the Centre and State levels. Technical support groups comprising professionals and voluntary organisations will be set up at Central, State and district levels for continuous review of policy and performance of NSAP during the Twelfth Plan. Documentary requirements for proving eligibility and identity have proved extremely onerous for the beneficiaries who are among the most vulnerable. It is hoped that the use of UID (once available) will ease some of these pressures. Many States have devised somewhat arbitrary and harsh exclusion criteria which have been applied in a mechanical manner that discriminate against some of the most vulnerable. Even having a living adult son has meant exclusion in some cases. Such practices must be stopped. Shifting to payment through post offices or banks is a significant step in ensuring transparency. But as under MGNREGA, where density of banks/POs is low or because of lack of adequate staff, people have had to suffer great hardships in the transition period. Aged and disabled people may not be able to reach the POs or banks. The banking correspondent model with UID biometrics could be a way out as it would provide payments at the doorstep in a transparent manner.

TABLE 17.19
Physical and Financial Progress of NSAP Components, Eleventh Plan

Year	IGNOAPS		IGNWPS		IGNDPS		NFBS		Annapurna	
	₹Crore	Lakh	₹Crore	Lakh	₹Crore	Lakh	₹Crore	Lakh	₹Crore	Lakh
2007–08	2,896	115.14					176	3.34	40	10.76
2008–09	3,422	150.21					329	4.23	47	10.41
2009–10	4,354	163.34	152	32.13	29	7.00	154	3.44	30	10.16
2010–11	3,528	170.60	524	34.25	134	7.28	324	3.35	45	9.58
2011–12	4,214	199.55	496	36.55	105	7.77	282	2.48	25	7.28

17.93. IT solutions need to be seen as central to scheme implementation and not just as a peripheral MIS system. Use of IT can help reduce discretion, stem leakages through duplication, enhance efficiency by reducing time taken between steps, reduce the need for reporting at multiple levels, and facilitate accounting, particularly in States with lower human resources capacity. To be most effective, IT needs to be an end-to-end solution. This means not only that the solution encompasses the entire process cycle—from application to pension payment—but that it links each of the functional processes to each other. The solution needs to be transaction-based in the sense that it must involve no or extremely limited opportunity for original transaction data entry. An electronic registry of beneficiaries will require digitisation of legacy data and continuous entry of new beneficiaries. Digitisation will need a robust data migration process (for example, minimise duplicates, reduce risk of missing records) to ensure accuracy. Mechanisms should be built in to cross-check the registry with other databases such as the SECC, UID or ration cards for verification. A robust electronic registry is the base on which application management can be built to record, acknowledge and check compliance with eligibility norms while minimising the burden of proof of documentation that is presently placed on the applicant.

17.94. In order to streamline the processes of communication of information of actual transfers to programme managers at the State level, an electronic fund management system (as described for MGNREGA above) could make a big difference. The NSAP guidelines do not require any formal fiduciary assurance from the States in terms of end-use of funds other than the annual utilisation certificate (UC). The basis for recognition of programme expenditure for the purpose of the UC is not clear, which may result in States adopting varying yardsticks for what is expenditure. Third party review of the payment processes and enforcement of ploughback of unspent balances with pension distribution agencies (PDAs) must be introduced so that the possibility of ‘ghost beneficiaries’ and unspent balances lying with PDAs is reduced.

17.95. At present, there is no mechanism for systematic revision of pension payments in line with inflation. A case can be made during the Twelfth Plan to adopt an approach similar to that adopted for MGNREGA wages, whereby an index such as the CPIAL or CPIIW could be adopted to tie pension payments to inflation, allowing for cost of living differences across States. The periodicity of revision could be aligned with preparation of annual budget estimates.

17.96. The use of BPL lists has led to large errors of inclusion and exclusion. Eligibility and coverage rates will need to be reassessed after the SECC process is completed.

FLEXI-FUND FOR RURAL DEVELOPMENT

17.97. There is an increasing demand to give States much greater flexibility in spending decisions with respect to Government schemes. The demand is justified on the basis that States have differing needs, priorities and levels of development and the ‘one size fits all’ model of Centrally Sponsored Schemes (CSS) does not allow these interstate variations to be adequately reflected. The BK Chaturvedi Committee has addressed this issue and proposed a new framework for introducing much greater flexibility as described in Chapter 10 of Volume 1 on Governance.

17.98. The Ministry of Rural Development has proposed going even further by setting up a Rural Development Flexi-fund (RDF) of ₹40,000 crores (of which 70 per cent would be the Central share of ₹28,000 crore) with the intent to devolve a significant share of Central funds related to Rural Development to the States over the Twelfth Plan period directly through this Fund. This would ensure better targeting and focused projects on state-specific priorities. It would also send a powerful signal about the Central Government’s deep commitment to cooperative federalism.

17.99. The RDF will be a separate line item in the Budget of the Ministry of Rural Development (MoRD). It would be available as an additional amount that can be spent either on existing Centrally Sponsored Schemes of the MoRD and Ministry of

Drinking Water and Sanitation, or on new projects proposed by the respective States. Thus the RDF would provide inter-scheme flexibility to States among the Centrally Sponsored Schemes of the Ministry of Rural Development and Ministry of Drinking Water and Sanitation.⁶ This will be in addition to the *intra-scheme flexibility* made possible by the BK Chaturvedi Committee for all Centrally Sponsored Schemes. The MoRD will lay out broad guidelines on what the RDF can be used for. In order to avoid inter-district distortions, the flexi-fund will be essentially a fund to incentivise: (i) innovation in service delivery, (ii) building sustainable rural infrastructure (iii) 'Greening' of rural development and (iv) devolution to and empowerment of PRIs.

17.100. With these provisos the RDF will be available for use under any CSS and even for work not currently covered under any of the CSS. In order to be eligible to use the fund, States will have to propose projects that merit support based on the above four criteria. The project reports (DPRs) prepared by the States will be discussed and approved by a Central Committee under the Chairmanship of Member (RD) Planning Commission, and comprising Secretary (RD), GoI and 2–3 eminent Rural Development experts.

PLAN OUTLAY

17.101. The tentative Gross Budgetary Support (GBS) for the Ministry of Rural Development for the Twelfth Five Year Plan (2012–17) is ₹4,43,261 crore. Out of this, about 85 per cent is for the flagship programmes implemented by the Department of Rural Development, that is, Mahatma Gandhi National Rural Employment Guarantee Act (₹1,65,500 crore), Indira Awas Yojana (₹59,585 crore), Pradhan Mantri

Gram Sadak Yojana (₹1,24,013 crore) and National Rural Livelihood Mission (₹29,006 crore).

17.102. The Twelfth Plan Central Sector Tentative Gross Budgetary Support for Rural Drinking Water Supply and Sanitation is ₹98,015 crore. 100 per cent of this outlay is for flagship programmes, namely National Rural Drinking Water Programme and Nirmal Bharat Abhiyan, administered by Ministry of Drinking Water and Sanitation. This provision will draw matching provisions from the States to the tune of ₹1,32,393 crore. Thus, the total outlays in the Twelfth Five Year Plan for Rural Drinking Water Supply and Sanitation sector would be about ₹2,30,408 crore.

NOTES

1. JP Morgan (2011): *India: Rural Wages Surge*, India Equity Research Reports.
2. Jean H Humphrey (2009): 'Child Undernutrition, Tropical Enteropathy, Toilets and Hand Washing', *Lancet*, 374: 1032–35.
3. Dean Spears (2012): *Effects of Rural Sanitation on Infant Mortality and Human Capital: Evidence from India's Total Sanitation Campaign*. This study uses administrative records on implementation of TSC and data from the third round of the District Level Household Survey (DLHS-3) and bulletins of the 2010–11 Annual Household Survey.
4. Dutta, P., S. Howes, and R. Murgai (2010): 'Small but Effective: India's Targeted Unconditional Cash Transfers.' *Economic and Political Weekly*, XLV(52) pp. 63–70.
5. Disability is legally defined as (i) blindness, (ii) low vision, (iii) leprosy cured, (iv) hearing impaired, (v) loco motor disability, (vi) mental retardation and (vii) mental illness. Persons with disability are persons suffering from not less than 40 per cent of any of the above disabilities as certified by a medical authority. Persons with severe disability are persons with 80 per cent or more of one or more disabilities. Multiple disabilities are combination of two or more disabilities.
6. Mahatma Gandhi NREGA is excluded from this list as it a special demand driven scheme based on a legal entitlement under the MGNREGA Act, 2005.

18

Urban Development

INTRODUCTION

18.1. About 377 million Indians comprising of about 31 per cent of the country's population, live in urban areas according to Census 2011. This is a smaller proportion compared to other large developing countries, for example, 45 per cent in China, 54 per cent in Indonesia, 78 per cent in Mexico and 87 per cent in Brazil. With the more rapid growth of the Indian economy in recent years, which is expected to continue, the rate of urbanisation will increase. Projections are that by 2031, about 600 million Indians will reside in urban areas, an increase of over 200 million in just 20 years.

18.2. Urban areas are engines of economic growth. Data on the urban share of the gross domestic product (GDP) for the Indian economy is not available on a regular and consistent basis but estimates by the Central Statistical Organisation (CSO), available for a few years, indicate that this share increased from 37.7 per cent in 1970–71 to 52 per cent in 2004–05. The mid term appraisal of the Eleventh Plan projected the urban share of GDP at 62–63 per cent in 2009–10.

18.3. Urbanisation will be central to India's strategy of achieving faster and more inclusive growth because agglomeration and densification of economic activities (and habitations) in urban conglomeration stimulates economic efficiencies and provides more opportunities for earning livelihoods. Thus urbanisation increases avenues for

entrepreneurship and employment compared to what is possible in dispersed rural areas. It, thereby, enables faster inclusion of more people in the process of economic growth.

18.4. Although the theme of a 'rural–urban divide' still colours some policy discourse in India, there is a growing recognition that urbanisation is necessary to realise India's growth potential, and that rural–urban linkages must be strengthened. Indeed this will accelerate growth of the rural sector also.

18.5. The High Powered Expert Committee (HPEC) under the chairpersonship of Dr. Isher Judge Ahluwalia that was constituted by the Ministry of Urban Development for estimating the investment requirements for urban infrastructure services has observed that the fortunes of the agricultural sector are crucially linked to the manner in which growth in the industry and services sectors unfolds. People living in rural areas typically tap the opportunities that cities provide for employment, entrepreneurial avenues, and education. As urbanisation grows, demand for food items other than food-grains, that is, vegetables, lentils, milk, eggs and so on, also grows. This leads to investments in infrastructure, logistics, processing and packaging in rural and peri-urban areas. Such investments and other economic inter-linkages connect and build synergy between rural and urban centres. Thus the rural sector also benefits from good management of neighbouring urban conglomeration.

Urbanisation Trends and Their Implications

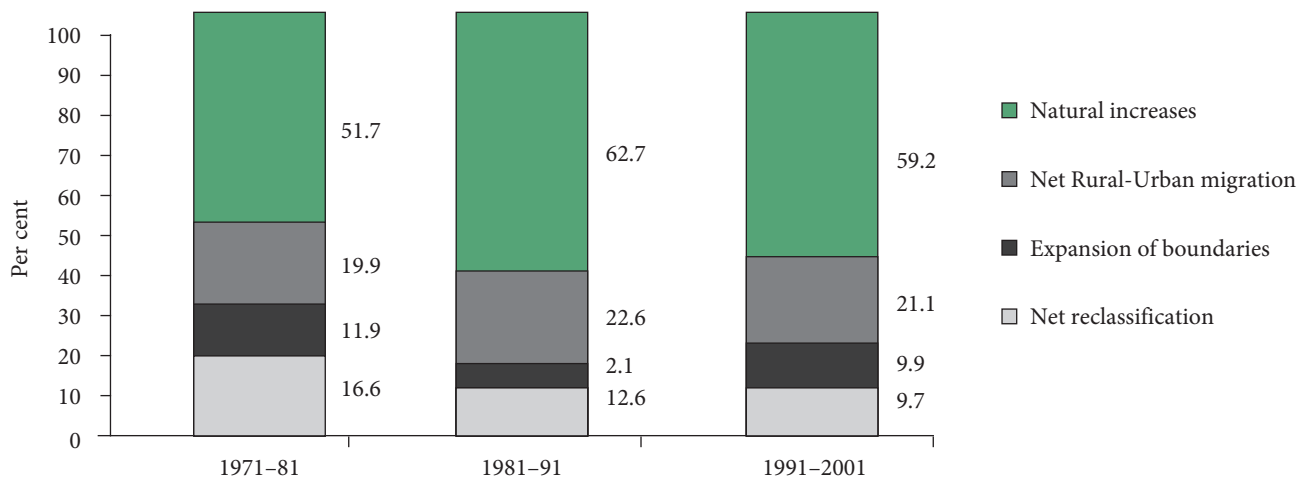
18.6. As mentioned above, the degree of urbanisation at 31 per cent of the population is one of the lowest in the world though it is accelerating. The share of persons living in urban areas rose by 3.35 per cent in the decade 2001 to 2011 while it had risen by only 2.10 per cent in the decade 1991 to 2001. The sources of increase in urban population are shown in Figure 18.1.

18.7. About 60 per cent of the growth in the urban population is due to natural increase. Rural-urban migration has contributed to only about 20 per cent of increase in urban population. In this regard, the Isher Ahluwalia HPEC has observed that notwithstanding three decades of rapid economic growth, rural urban migration has remained relatively low as industrialisation has been capital intensive and the services boom fuelled by the knowledge economy has also been skill intensive. This has prevented Indian cities from realising their full potential of generating employment opportunities and consequently making the development process more inclusive.

18.8. There is a concentration of the urban population in large cities and existing urban agglomerations. As per census 2011, there are 53 million plus cities accounting for about 43 per cent of India’s urban population. Class-I cities with population over 3 lakh

accounted for about 56 per cent of the urban population and with a population ranging from 1 lakh to 3 lakh accounted for another 14 per cent. This pattern of population concentration in large cities reflects spatial polarisation of the employment opportunities. While it is expected that gains from an agglomeration economy would lead to some polarisation of economic activities, there is a need for developing an optimal portfolio of cities by drawing regional development plans and promoting growth centres that are employment intensive and consistent with the economic potential including the natural endowment of cities and regions. The availability of water to provide for the needs of a large urban population must be a critical factor in plans for urban development.

18.9. Though the proportion of urban population concentrated in larger cities continue to remain high, there is some evidence that other urban growth nodes are emerging underscoring the need for adequate policy attention to smaller cities and peri-urban areas as against the narrow focus of concentrating on large ‘Mission Cities’ as was followed in the Eleventh Plan period. Census 2011 notes that the number of towns in India increased from 5,161 in 2001 to as many as 7935 in 2011. It points out that almost all of this increase was in the growth of ‘census’ towns (which increased by 2,532) rather than ‘statutory’ towns (which increased by only 242).



Source: Reproduced from Isher Ahluwalia Hpec Report (2011).

FIGURE 18.1: Sources of Increase in Urban Population

‘Statutory’ towns are towns with municipalities or corporations. Whereas, ‘census’ towns are agglomerations that grow in rural and peri-urban areas, with densification of population that do not have an effective urban governance structure or requisite urban infrastructure, for example, sanitation, roads and so on in place.

18.10. An accelerated pace of urbanisation would imply significant spill over of existing cities into peri-urban areas. As borne out by a recent study by the World Bank—*India Urbanisation Review: Urbanisation beyond Municipalities* (2012) already there are evidences that peri-urban areas in the vicinity of large cities are centres of intense economic activities. A large number of new towns are ‘born’ in the vicinity of existing cities with million plus population. If these trends are any indication of how the future will unfold, much of India’s urbanisation challenge will be to transform land-use and expand infrastructure in its largest cities and neighbouring

suburbs—places that are not pristine or green field, but already support 9 per cent of the country’s population and provide 18 per cent of the employment on 1 per cent of the country’s land area. Jobs and people are flowing from metropolitan cores to nearby settlements—regardless of whether they are classified as urban or rural often giving rise to haphazard urbanisation in the peri-urban areas. The challenge is to ensure that new cities and existing metropolises are connected and land-use change is coordinated with infrastructure development to accommodate urban redevelopment and urban spatial expansion (refer to Box 18.1). Failure to do so would eventually necessitate expensive ‘retrofits’ in future.

The Country’s Urban Conditions and Challenges

18.11. Broadly, the urban sector in India faces two distinct but mutually linked sets of challenges. Based on NSSO Report No. 508 (2004–05) it is estimated that the number of urban poor had increased by

Box 18.1 Vision of Our Cities

The objective of the Twelfth Plan is faster, more inclusive and more sustainable growth. The vision of India’s urban growth must be aligned with the objectives of inclusion and sustainability.

Urbanisation should be guided towards inclusive, equitable and sustainable growth of towns and cities with proper civic amenities. Good urbanisation would ensure that towns and cities are free from slums and provides adequate opportunities for productive employment and a decent quality of life to all their inhabitants including the poor.

The smart cities of our vision would be engines of growth as they would increasingly compete for investments nationally and internationally too. Therefore, cities must provide world class infrastructure and services at affordable costs to give a competitive edge to the economic activities they host. Besides, cities should be able to provide basic services to migrant workers, their families and other vulnerable sections of society including women and children. The future renewal of our cities should facilitate transition from ‘informality’ of large number of workers towards more formal livelihoods in line with their aspirations. They should address various vulnerabilities including residential, occupational and social vulnerabilities, associated with urban poverty. As an overriding principle, ‘people’ should be brought to the heart of the urban agenda, for both, deciding the vision of their city and for choosing the process of reaching that goal. This implies that all citizens have access to basic services of clean water, sanitation, sewage, solid waste management, urban roads, safe and affordable public transport systems, affordable housing, and a clean and healthy environment. Besides creating avenues for gainful employment, Indian cities should also meet the rising aspirations of people for a better quality of life. Citizens should be proud of their towns and cities and take responsibility for their cleanliness, safety and hospitality.

Environmental sustainability of Indian cities is another integral part of the vision. Future growth should be consistent with cities’ natural endowments and the economic potential of the region in which they are situated. All cities should be efficient in using available resources particularly energy, water and land.

Our cities must also preserve and foster their cultural and historical heritage and benefit from the tourism potential of their heritage and natural endowments.

34.4 per cent from 1973 to 2004. The NSSO (66th round) has estimated that during the period 2004–05 and 2009–10, the unemployment rate in terms of the usual status decrease by 1 percentage point for both, urban male and females notwithstanding an impressive growth registered by the economy in this period. Hence, the first challenge is to significantly step up the rate of creation of jobs in the urban sector

18.12. The second set of challenges before the Government is to guide the process of urbanisation and ensure that basic services, for example, sanitation, water supply, and basic housing are provided to urban citizens expected to be around 600 million within 20 years. If these challenges are not tackled expressly, not only would India's cities get increasingly chaotic and choked, rural poverty will be converted to urban poverty with no gains to improvement of livelihoods of India's burgeoning population.

18.13. Already, cities and towns of India are visibly deficient in the quality of services they provide, even to the existing population. A recent compilation of key indicators of the present state of urban service delivery is given in Box 18.2.

18.14. The high coping cost of deficient infrastructure especially to the urban poor has been reported in several studies. For example, due to the intermittent and inadequate supply of water, it has been estimated that the urban poor pays significantly more than the average price for water, often tenfold higher. In a city sanitation study, conducted by the MoUD (2010) none of the 423 cities where the study was conducted were found to be 'healthy and clean'. The Water and Sanitation Programme of the World Bank, using data for 2006, suggested that per capita economic cost of inadequate sanitation in India is ₹2,180. The cost in terms of Disability Adjusted Life Years (DALY) of

Box 18.2 State of Service Delivery—Key Indicators

Water supply: As per 2011 census 70.6 per cent of urban population is covered by individual connections, compared with 91 per cent in China, 86 per cent in South Africa and 80 per cent in Brazil. Duration of water supply in Indian cities ranges from 1 hour to 6 hours, compared with 24 hours in Brazil and China and 22 hours in Vietnam. Per capita supply of water in Indian cities ranges from 37 lpcpd to 298 lpcpd for a limited duration, while Paris supplies 150 lpcpd continuously and Mexico 171 lpcpd for 21 hours a day. Most Indian cities do not have metering for residential water connections. Seventy per cent of water leakages occur from consumer connections and due to malfunctioning of water meters. Non-revenue water (NRW) accounts for 50 per cent of water production compared with 5 per cent in Singapore.

Sanitation: Even a partial sewerage network is absent in 4861 cities and towns in India. Almost 50 per cent of households in cities like Bangalore and Hyderabad do not have sewerage connections. As per 2011 census, about 13 per cent of urban households do not have access to any form of latrine facility and defecate in the open. Census 2011 also revealed that about 37 per cent of urban households are connected with open drainage and another 18 per cent are not connected at all. Less than 20 per cent of the road network is covered by storm water drains. As per the report of the Central Pollution Control Board (CPCB) 2009, only about 20 per cent sewage generated was treated before disposal in Class I cities and Class II towns (as per 2001 census). As per CPCB report brought out in 2005, about 1,15,000 MT of Municipal Solid Waste is generated daily in the country. However, scientific disposal of the waste generated is almost non-existent.

Public transport: Public transport accounts for only 27 per cent of urban transport in India. Share of the public transport fleet has decreased from 11 per cent in 1951 to 1.1 per cent in 2001. In 2009, only 20 out of 85 Indian cities with a population of 0.5 million had bus services.

Source: As compiled in Isher Ahluwalia HPEC report (2011) and Census of India and MoUD

Affordable housing: The Technical Group on the Estimation of Housing Shortage projects the total shortage of dwelling units in urban areas in 2012 to be 18.78 million units. The projected slum population in India is 94.98 million in 2012. As against this, the number of dwelling units sanctioned under JNNURM in 7 year Mission period was 1.6 million units. The supply of decent affordable housing by private sector has remained woefully inadequate.

Source: Ministry of Housing and Urban Poverty Alleviation and Report of the Pronab Sen Committee on Slum Statistics (2010).

diarrhoeal disease for children from poor sanitation is estimated at ₹500 crore (HPEC 2011).

18.15. Many studies have demonstrated that there is considerable positive impact on health status after having adequate access to water and sanitation, both in terms of hygiene related behaviour as well as reduction in water borne diseases and skin diseases. There is a very strong gender dimension to safe water and sanitation. Women bear the maximum brunt in their absence. They are forced to spend time and energy collecting water for the household use and by that are forced to give up on income generating opportunities and leisure time. There are severe health consequences of such work on women. In absence of sanitation they have to go out in dark only for defecation which has adverse health consequences on them besides increasing risks of sexual violence. Higher morbidity rates within the families because of lack of these services forces them to spend time on caring for the sick within the family and thereby increasing their burden. This also leads to poor health status of women and lower incomes in their hands.

18.16. The scenario in urban transport is equally alarming. Current urban transport trends in Indian cities are leading to broader sustainability challenges for people and the environment in terms of lost man-hours due to long commute times, greater reliance on expensive private transport, increasing emissions and road fatalities. A MoUD study in 2010 based on sample of 87 cities estimated that under a business-as-usual scenario, in about 20 years time, the expected average journey speeds on major corridors in many cities would fall from 26–17 kmph to 8–6 kmph.

18.17. Air quality has also deteriorated sharply carrying with it concomitant health costs. For instance, per capita emission levels in India's seven largest cities have been estimated (Palanivel 2002) to be at least three times higher than the WHO standards. Air pollution levels were low in only three cities of the 127 cities monitored by the Central Pollution Control Board under the National Air Quality Monitoring Programme (2009).

18.18. To conclude, urbanisation is increasing at a faster rate than earlier. Since urbanisation is 'efficient' and could be job-creating, it must be planned and properly guided. An accelerated pace of urbanisation would also result in significant spill over in peri-urban areas and therefore, these areas need to be included in urban planning and provided for. While India needs to plan for its urban expansion, the conditions of delivery of services in existing cities and decent housing even for the current level of urban population is highly deficient. There is a pressing requirement to address the problem of urban poverty. The task enumerated above calls for a renewed thrust towards improvement in governance structure especially at the level of urban local bodies and a major improvement in delivery of urban services in cities.

REVIEW OF MAJOR INITIATIVES TAKEN UNDER THE ELEVENTH PLAN

JNNURM

18.19. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched in December 2005 for a period of seven years with an outlay of ₹66,085 crore. The objectives of the scheme included empowerment of Urban Local Bodies (ULBs), planned and holistic development of cities and making them inclusive. The scheme mandated preparation of City Development Plans (CDP) and a set of urban reforms at State and Municipal levels.

18.20. JNNURM renewed the focus on urban renewal and gave impetus to many urban reforms. Central allocation of ₹66,085 crore led to overall commitment of investment of ₹1,23,711 crore under the scheme (refer to Table 18.1).

18.21. Some of the key inadequacies noted during implementation of the programme included failure to mainstream urban planning, incomplete reforms and slow progress in project implementation. Delay in securing land for projects and obtaining approval from various regulatory authorities also led to delay in implementation of some of the projects.

18.22. Despite the stress on urban planning, in many cities the planning process is yet to be strengthened

TABLE 18.1
Physical and Financial Progress under JNNURM (March 2012)

	UIG	UIDSSMT	BSUP	IHSDP	Total
7 year Allocation (in ₹ crore)	31,500	11,400	16,357	6,828	66,085
No. of Projects sanctioned	559	808	528	1,078	2,973
Total cost of project (in ₹ crore)	67,275	14,039	30,416	11,981	1,23,711
Total ACA Committed (in ₹ crore)	30,971	11,372	15,092	7,704	65,139
Total ACA released (in ₹ crore)	18,479	8,469	8,642	4,905	40,495
Per cent of ACA released to ACA sanctioned	60%	74%	57%	64%	62%
No. of DU approved in lakh (BSUP and IHSDP)			10.3	5.7	16.0
No. of projects completed (UIG and UIDSSMT)	127	142			269
No. of Dwelling units completed (in lakh) (BSUP and IHSDP)			4.4	1.8	6.2

and made participatory. Invariably peri-urban areas around cities' limits have grown haphazardly. Lack of participatory planning has resulted in programmes suffering from 'lack of ownership'.

18.23. A significant interstate variation in completion of reform underscores the need for their careful calibration on the basis of city size and capabilities. In many States, incomplete governance and financial reforms prevented emergence of the municipal entities as viable and financially sustainable entities. Lack of capacity has further emerged as a serious constraint. Thus, despite some good examples in some cities, the overall progress in improving service delivery standards has been unsatisfactory. Another major shortcoming was the limited success in leveraging of JNNURM fund by locating non-budgetary financial resources including funds under PPP framework.

Other Initiatives in the Urban Sector in the Eleventh Plan

18.24. Swarna Jayanti Sahari Rozgaar Yojana (SJSRY) is designed to enable urban poor to get gainful employment. Under this scheme 3,941 towns have been covered and an assistance of ₹3,360 crore has been released. Since inception, about 12.3 lakh persons have been imparted training under the scheme. For making India slum free, pilot phase of Rajiv Awas Yojana was launched in 2011. The scheme has

a progressive architecture which includes in-situ rehabilitation of slums and legislation to provide property rights to slum dwellers. Another thrust has been implementation of the Employment of Manual Scavengers and Construction of Dry Latrines (prohibition) Act 1993. Under the Integrated Low Cost Sanitation Scheme (ILCS) 2.5 lakh dry latrines have been converted into sanitary ones and about 1.55 lakh new toilets have been sanctioned.

Urban Transport

18.25. A major achievement leading to transformational change in public transport has been a significant extension of Metro rail network in large cities. Delhi metro phase-II has been successfully completed and phase-III involving an investment of ₹35,242 crore is under implementation. Metro rail projects in Bangalore, Chennai and Kolkata involving an investment of ₹31,084 crore are under implementation. In addition, metro projects in Hyderabad and Mumbai involving investment of more than ₹22,000 crore are being developed on a Public-Private Partnership basis. Under JNNURM, 21 projects including Bus Rapid Transit (BRT) System with an approved cost of ₹5,211 crore were sanctioned. Besides, purchase of 15,260 buses gave a major boost to public transport. Another 123 projects like roads, flyovers, ROBs and parking projects with an approved cost of ₹10,162 crore were sanctioned for traffic improvement and parking (refer Box 18.3).

Box 18.3
Transforming Public Transport in Cities

Under UIG component of JNNURM, 15,260 low-floor and semi-low-floor buses enabled with intelligent transport system were sanctioned to 65 Mission cities with admissible central assistance of ₹2,089 crore. As a result of the scheme, 34 cities across India have organised city bus services for the first time.

Conclusion

18.26. JNNURM has led to a significant step up in investment in urban sector. However, urban sector continues to suffer from low-level of service delivery, structural problems, grossly inadequate availability of resources and lack of capacity at different levels of the government. Successful management of India’s urbanisation would not only require a significant step up in investments for urban improvements under the Twelfth Plan period, but also emphasis on measures to address the glaring weaknesses in urban governance and management. In addition, reducing urban poverty has emerged as a major thrust area in managing our cities.

Strengthen Urban Governance

18.28. Despite the 74th Constitutional Amendment, which required States to transfer eighteen functions to the ULBs, there is significant variation in devolution of functions, functionaries and funds across the States. City mayors lack the powers and tenure to be truly accountable for delivery of urban services. At the metropolitan level, Metropolitan Planning Committees (MPCs) are yet to evolve and District Planning Committees must function not only in letter but in the intended spirit too. In most States either State agencies or parastatals are in-charge of urban service delivery rather than ULBs. This maze-like structure of management and accountability hampers good urban management.

THE STRATEGY FOR URBANISATION

Enablers for effective urbanisation

18.27. The strategy for the Twelfth Five Year Plan will be focused on strengthening the five enablers for urbanisation—governance, planning, financing, capacity building and innovation (Figure 18.2).

18.29. To strengthen the urban governance framework, it is proposed to adopt the following strategies during the Twelfth Five Year Plan period:

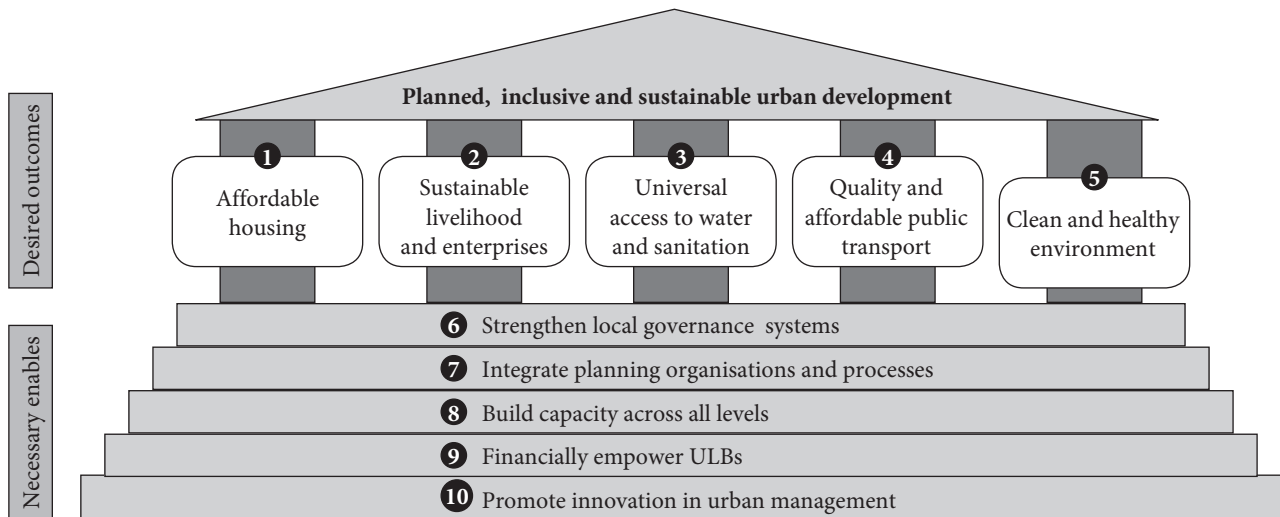


FIGURE 18.2: Key Constitutes of India’s Urban Future

Achieve Convergence at the Central Government Level

18.30. Urban development, housing and poverty alleviation are inter-related subjects. Various expert bodies including Isher Ahluwalia led HPEC have recommended the merger of the Ministry of Urban Development with that of the Housing and Urban Poverty Alleviation. Their merger would improve the effectiveness and the efficiency of urban management in India. Till this is achieved, a concerted effort must be made for convergence of the programmes and initiatives of both the Ministries and merger of both the Ministries deserves a careful consideration. Ultimately all schemes run by different Ministries of the States and the Central Government must converge on ground at the municipal level. This must be an overarching guiding principle for the Twelfth Plan.

Set Up Municipal Services Regulators

18.31. An independent utility regulator should be set up at the State level to monitor service levels and adjudicate disputes related to delivery and pricing of services. The regulator would facilitate transparency by regular publication of service level benchmarks, and help set the vision for ULBs. Therefore, setting up of a suitable urban regulator at the State level must be a priority.

Empower and Extend the Term of the Mayor

18.32. Eminence of elected bodies in decision making is a prerequisite for participatory development processes. JNNURM pushed for elections to municipal bodies. The stage has come where the heads of such elected bodies should be adequately empowered. With the objective of establishing single point accountability the Mayor should be the executive head of the city. Also the Mayor should be vested with appropriate authority, for example, in a Metropolitan Area the Mayor of the largest ULB should be the Chair of the Metropolitan Planning Committee. While local conditions should determine whether cities should adopt a Mayor-in-Council or an Executive Mayor system, in either scenario, the Mayor's term should be extended to five years. The Isher Ahluwalia HPEC has also recommended that the executive head of the city will

need to be empowered to run an efficient system of delivering urban services in a manner which harnesses agglomeration economies, minimises congestion diseconomies and creates a socio-economic environment that attracts investment and generates livelihoods whilst adhering to the constitutional requirements of a duly elected legislative body, the third-tier of Government. Hence suitable empowerment of mayors should be mandated as a key governance reform under JNNURM.

Strengthen the Unified Metropolitan Transport Authority (UMTA)

18.33. As recommended by the Second Administrative Reforms Commission, all the million plus metropolitan areas should set up an UMTA to develop and implement city level transportation plans. These must be integrated with spatial and land use plans of cities.

Introduce Citizen Charters

18.34. Every municipality should publish a citizen's charter. The charter should contain comprehensive information on service levels for all urban services, including the same for basic services for the urban poor at ward level and specification of time limits for approvals relating to regulatory services such as licenses and permits. The charter should also specify the relief available to the citizens in case of non-adherence as prescribed in the report of the Second Administrative Reforms Commission.

Increase Adoption of Information Technology at the ULB Level

18.35. Information Technology (IT) can play an important role in improving governance. With municipal administration becoming increasingly complex, the benefits of IT adoption are becoming more visible across several municipalities. E-governance must be a mandatory reform under the renewed JNNURM and its implementation should be required in all cities receiving assistance under the capacity building component of the Mission. A major constraint in full fledged transition to e-governance is lack of a suitable national level architecture. This has led to States and ULBs independently developing e-governance platforms which are often mutually incompatible. This has also prevented

States from replicating successful architecture developed in other States leading to avoidable expenditure. To address this problem, the Ministry of Urban Development should finalise a suitable national level architecture with sufficient flexibility for customisation at the State and ULB level within the first year of the Twelfth Plan.

Clarification of Roles of ULBs and Parastatals

18.36. In large metropolitan areas and cities, dedicated Government agencies with operational autonomy should be carved out to provide services like water supply, solid waste management, sewerage, sanitation, primary health services, primary education, roads and urban transport. The elected municipal bodies may procure services from these agencies by entering into suitable MoUs with them with clearly specified and mutually agreed upon output parameters/deliverables. This arrangement would make delivery of services more accountable to people while the expert knowledge available with parastatals will be available in conceptualisation and implementation of projects (refer Box 18.4).

Set Up Area Sabhas and Ward Committees to Decentralise Urban Governance

18.37. Ward Committees and Area Sabhas should be set up for institutionalising participatory development process for effectively carrying out the functions devolved to ULBs under the Twelfth schedule of the Constitution. For this purpose, Area Sabhas would be constituted by comprising all citizens in one or two polling station areas who should elect, once in a five year, a small Committee of representatives. Further, Ward Committees should be set up in every electoral ward of Municipalities and Panchayats by drawing representatives from Area Sabhas. Together, these institutions will ensure that executive power is located at the ULB level, while the deliberative powers are vested with the Ward Committee. These structures will institutionalise participatory and accountability mechanisms. These structures should be further empowered through enactment of Community Participation Act and Public Disclosure Law. Enactment of these laws would be part of the mandatory reforms under the renewed JNNURM.

Box 18.4

Harmonising the Role of Parastatals with Elected Municipal Bodies

A frequently expressed criticism of JNNURM has been that large numbers of projects were executed through parastatals. As a result, ULBs, which are the main institution under the constitutions for participatory governance at ground level, have remained marginalised. Lack of participatory process has reduced ownership of programmes by people. At the same time, planning and execution of urban service delivery like water supply, sanitation, urban transport and so on are highly interdependent and complex in nature and require technical inputs. Thus, a key challenge is harmonising the role of experts dominated parastatals with the elected municipal bodies representing people for whom the Plan is drawn.

The roles and responsibilities of different institutions in such situations should be clarified along five principal dimensions:

- **Unique Purpose:** Each institution should have a clearly defined 'unique' purpose for itself, in line with people's aspirations. Typically it should not overlap with any other institution at the same federal level
- **Measure of Effectiveness:** In line with the unique purpose, relevant measures of effectiveness should be put in place. These will not only help in creating external accountability for the institution as a whole, but will also provide guidance to the individual employees to discharge their duties.
- **Exclusive Decision Rights:** The decisions which the institution is empowered to take and which others are required to follow must be specified. These decisions rights must be reconciled with decision rights granted to other institutions.
- **Expertise and Capabilities:** Empowering any institution with certain decision rights alone is not enough. The critically necessary capabilities/expertise required by the institution to perform its functions and fulfil its purpose must be defined, along with processes for ensuring it will have these capabilities.
- **Inter-linkages within the Ecosystem:** Lastly, it is critical to understand the inter-linkages with other institutions in a complex, multi-institutional environment. A particular institution may have different types of relationships with other institutions. These could range from being a regulator, to having a contractual arrangement or serving as a technical advisor.

Put In Place a Fiscal Responsibility Framework for ULBs

18.38. Adoption and monitoring of prudent financial management in ULBs should be institutionalised through appropriate legislation. ULBs should prepare a medium term (10 years) fiscal Plan, fix a ceiling for revenue expenditures and perform regular audits.

Adopt an Outcome Based Approach and Put Up a Robust Monitoring Mechanism

18.39. A significant change would be to shift to outcome-based monitorable milestones as a measure of performance instead of exclusively relying on expenditure. The implementing ministries should suitably draw their Result Framework Document (RFD) for better implementation of programmes aligned to the needs of people. For instance, Ministry of Housing and Urban Poverty Alleviation may draw a quantitative target of reduction of households staying in slum. Ministry of Urban development may draw target of increase in share of public transport; coverage of access to water and sanitation and so on. This robust system of monitoring of the implementation of the Plan would also require frequent consultations with all stakeholders including elected representatives, citizens groups, civil societies and experts. All the schemes drawn under the Twelfth Plan must contain these provisions for monitoring and for receiving feedback so that plans are owned by the people for whom and progressively by whom, they are made.

Set up Lokayuktas/Ombudsman at State and City Level

18.40. In line with the recommendations of the Thirteenth Finance Commission, it is essential to bring local office bearers, councillors and other office bearers under the purview of an Ombudsman or the Lokayukta. The role of the Ombudsman would be to mediate conflicts between citizens and various urban authorities.

Urban Planning

18.41. A key weakness of India's urbanisation efforts is that the agenda is being implemented through disjointed projects/activities with inadequate or no planning for the urban area as a whole. The 'Master Plan' approach generally focuses on only the core

area of the city, has little linkages to any financial and operating strategy and, in many cases has been used as a regulatory tool instead of being a blue print for development of dynamic and smart cities. A master plan typically freezes the land use pattern and building bye-laws and so on determines the permissible limits of Floor Space Index (FSI) and minimum set-back areas. Often these provisions do not take into account the potential of the city to grow, especially where trunk infrastructure has been laid. This results in sub-optimal use of land as well as the infrastructure. Though JNNURM mandated preparation of City Development Plans (CDP) before taking up any projects, in many cases, the CDPs became hastily put-up documents with limited consideration of socio-economic aspects. Exclusion of peri-urban areas where fast growth is taking place has further limited the adequacy of such planning for guiding the emergent needs of a city.

18.42. Absence of any long-term plan prevents development of 'good cities' in which all the parts of the system—urban services, transportation, housing, commercial activities—fit together harmoniously. Planning must be holistic before it is detailed, for example, urban housing and urban poverty issues cannot be separated from other aspects of urban planning. A whole-city-approach is required and, therefore, there is a need for both Central Ministries which provide assistance under JNNURM for urban renewal to work very closely together. Holistic planning, even if not detailed, is required at the local urban level, at the metropolitan level and at State and national levels too.

18.43. The concept of 'Master Plan' to guide a city's long-term development has evolved in many countries to increase the quality of participation of all sections of citizenry in the preparation and endorsement of the plan. Earlier master plans used to be prepared mostly by experts in urban planning to engineer the physical layout of the city which often excluded the needs of citizens, especially the poorest whose requirements thus became peripheral to the Plan. Best practice master planning today is a core participatory process and addresses the needs of citizens more holistically.

City Development Plan and Financial Plan

18.44. Every city/town should mandatorily draw a *Development Plan (DP)* by taking at least a 10-years perspective. The plan should take into account a city's natural endowment, and its economic potential and should promote clean and green city. It should specifically provide for the following:

1. Strategic densification especially along mass transit corridors with mixed land use
2. City mobility plan with special emphasis of making cities safe for vulnerable groups including women and children, pedestrian and cyclists
3. City sewerage and sanitation plan
4. City water plan
5. Economic and commercial activity plan
6. Infrastructure plan
7. Affordable housing plan
8. Environment conservation plan
9. Urban poverty reduction strategy and inclusion-ary zoning (old age homes, orphanages, working hostels, night shelters and so on)
10. Plan for peri-urban area

18.45. Financial plans that indicate the sources of funds required for the holistic urban development of a city must also be prepared. Performance against the agreed upon targets indicated in the Financial Plan should not only be used to monitor the efficacy of financial reforms being implemented across the State and city but also form the criteria of release of central assistance to the ULBs.

18.46. Drawing of DP and FP should be a necessary precondition for receiving assistance under the renewed JNNURM.

18.47. To ensure planned development of cities, a series of policy and institutional strategies should be adopted during the Plan period:

Ensuring Citizens' Participation at the Planning Stage

18.48. Success of any Plan depends on the extent it is owned by the people. This in turn would depend on what the Plan does for a common person. Since,

in an emerging economy, every sector makes a claim for available resources, it is necessary that scarce resources made available for the urban sector are utilised efficiently and spent in the manner that is relevant for the people. Therefore, in accordance with the spirit of the 74th CAA, it is necessary that 'people' should be brought to the heart of the urban agenda, both, for deciding the vision of their city and for choosing the process of reaching the goal. Thus, involvement of people through Area Sabha and Ward Committees in the Planning Stage must be a necessary prerequisite for implementation of all schemes for urban development including schemes for slum improvement.

Constitute/Strengthen the Metropolitan Planning Committees (MPC) and District Planning Committees and Restructure the Role of the Metropolitan Development Authority

18.49. As per the 73rd and 74th CAA, a minimum of 2/3rd of the MPC shall be constituted of elected representatives from the metropolitan region, and a minimum of 4/5th of the DPC shall be elected by, and from amongst, the elected members of the District Panchayat and Municipalities in the district in proportion to the ratio between the population of the rural areas and of the urban areas in the district. Currently, DPCs are dysfunctional in most States.

18.50. Once constituted, the MPC/DPC should create the spatial development Plan for the region including any rural areas that may lie within the district boundary but outside the municipal limits of an urban area. Such Plans should take a longer 20+ year perspective with a formal review every 5 years. The broad Spatial Development Plan should then be used by the ULBs as a guiding framework to create the second level detailed plans for the city. The timeline of the Metropolitan Development Plans and the District Development Plans should be synchronised with ULB Spatial Plans.

18.51. The Metropolitan Development Authority under the aegis of the Metropolitan Planning Committee should be vested with the responsibility of enforcing and regulating the metropolitan

development Plan. It should be the appellate authority for conflict resolutions on spatial plans for all Local Planning Authorities in the metro region, in keeping with the letter and spirit of the Constitutional Amendment Act.

18.52. Given the revised mandate of the Development Authority it should be relieved from responsibilities related to project implementation and land development so as to avoid any conflict of interest between the roles of planner/regulator, and that of project implementer or developer. Finally, it is recommended that the Chief Planning Officer and his establishment in the district ought to become part of the technical support system of the DPC.

ULBs must Prepare Municipal Plans while Utilities, Environmental Bodies and Parastatals should Provide Technical Inputs

18.53. Each municipality must mandatorily fulfil its obligation to produce a spatial plan within a specified time period. The Spatial Development Plans prepared by a municipality should be submitted to the MPC/DPC. Any directions given by the MPC/DPC from the point of view of ensuring the fulfilment of requirements and imperatives of the notified Metropolitan/District SDP should be complied with and these should be binding on the municipality. The spatial plan which fully complies with such directions (if any) shall be approved by the concerned municipal corporation/council. This will not only ensure compliance with the requirements of regional planning, but will also safeguard the power of the individual ULBs to approve the SDPs prepared by them without submitting it to the State Government for final approval.

Modify State Town Planning Acts, Municipal Laws, Building Byelaws and Land-Use Conversion Norms

18.54. These legislations need to be reviewed and revised to address the current challenges of urbanisation as well as to reflect recent policy recommendations to allow regional decentralisation and citizen participation. Metropolitan plans should be binding on municipal plans and should integrate top-down and bottom-up plans, reinforcing the concept of

‘urban development regions’ around the municipal boundaries.

Provide Incentives for Strategic Densification of Cities/New Towns on Growth Corridors

18.55. Strategic densification as a planning strategy should be pursued to accommodate future urbanisation needs. In addition, mandating inclusionary zoning and providing higher FSI to make the economics of affordable housing viable should be considered. Similarly, new cities may be planned to nurture emerging growth nodes in the urban landscape. However, as international experience indicates, the success of new cities is dependent on factors like their proximity to, as well as connectivity linkages with an existing metropolitan city. An effective regulatory regime which allows ease in conversion of land use while cities and their peri-urban areas are developing is critical. As a long-term strategy, the Ministry of Urban Development should identify such corridors and nodes with urban growth potential and facilitate their development (refer Box 18.5).

Consider Land Readjustment

18.56. Land readjustment (LR) is gaining acceptance as an alternative to land acquisition as it has many advantages for land assembly. Under this process, a compact area is selected in consultation with the land owners for urban expansion/renewal. The municipal authorities provide infrastructure which is funded by exploiting a part of land. The remaining land, whose value has increased due to provision of infrastructure, is reallocated back to participating private land-owners. In essence a participatory tool, LR avoids public discontent and protests to a great extent. It also reduces the need for raising large amounts of money for acquiring land. However, successful LR is grounded in three main enablers:

- Fairly well-defined property rights
- Streamlined, independent and transparent evaluation processes
- Strong judicial system to address public concerns

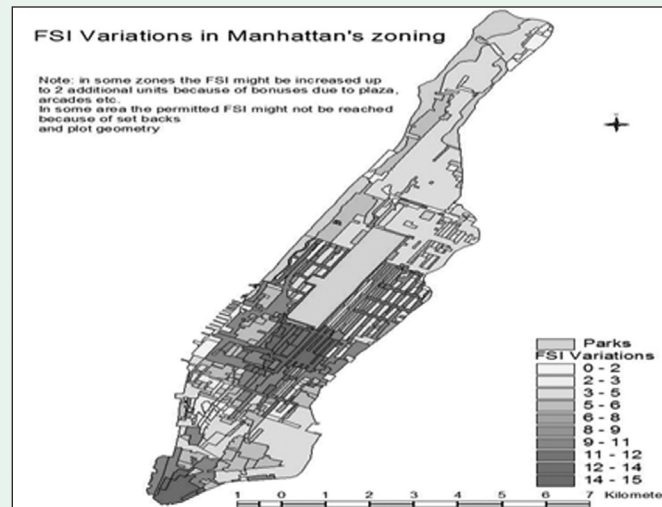
Financing Urban Infrastructure

18.57. The Isher Ahluwalia Committee on Urban Infrastructure and Services (2011) estimated the

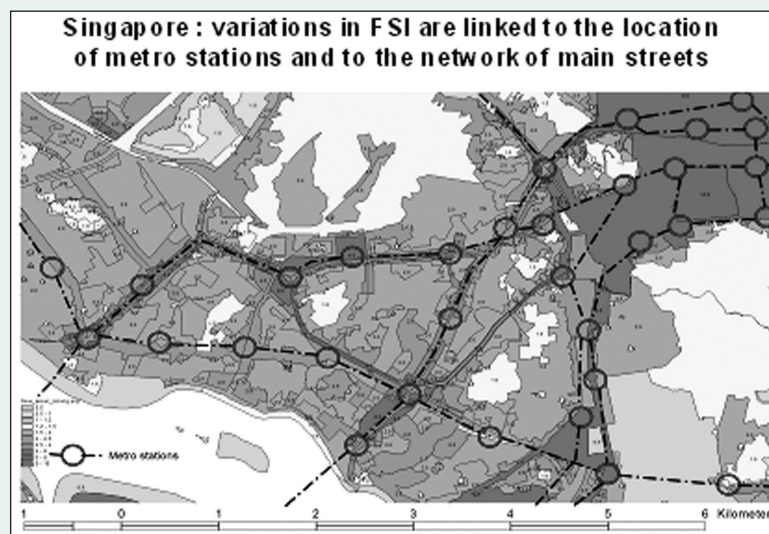
**Box 18.5
Strategic Densification—International Examples**

Large Indian cities have high population density. However, FSI in these cities are low compared to many smart cities in the world. This results in low per capita availability of urban space. Strategic densification of cities through higher FSI has numerous advantages: it makes the cities compact and efficient and frees space for accommodating more people as well as for providing urban amenities. Pricing of higher FSI also generates resources for funding urban infrastructure projects.

In Manhattan, as well as in other international best practice examples, FSIs vary by location and land use. Density zones are typically small and are determined by street width and capacity as well as land use patterns. Commercial and office districts typically have higher FSIs than residential districts. FSIs are set in conjunction with the formulation of development and strategic plans. Optimising infrastructure and density is a central element of urban planning.



Singapore makes highly effective use of FSI with variations by location and type of use. FAR is higher near metro stations because transport system can accommodate increased density. As higher FSIs will require more infrastructure investments, they can be financed by suitable instruments like development fees or pricing of Tradeable Development Rights (TDRs) and so on.



Source: India Urbanisation Review: Urbanisation beyond Municipalities (2012), World Bank.

total capital investments in urban infrastructure at about ₹39 lakh crores over the next 20 years. To meet this requirement, ULBs will need to identify robust revenue streams. In addition, both central and State Governments will also have to increase their commitment to the urban sector.

18.58. Working on the 20 year estimate provided by the Ahluwalia Committee, three alternative scenarios of covering the backlog of service deficits in 10 year, 15 years and 20 years respectively were developed for projecting investment. The aforesaid 15-years scenario up-fronted investment in water and sanitation sectors as well as investment in capacity building in view of the huge externalities and also moderated its projection on the basis of capacity constraint. Unless stated otherwise, the estimates so derived have been used in the chapter.

18.59. The share of ULBs' own revenues has declined significantly from 63 per cent in 2002–03 to 53 per cent in 2007–08. Property Tax collection is hampered by poor assessment methods, limited coverage, weak collection efficiency, loss on account of exemptions and poor enforcement. User charges also remain low, most often lower than the operational costs for ULBs. Most States have also not fully implemented the recommendations of State Finance Commissions, leaving ULBs with unpredictable funds' transfers from State Governments.

18.60. During the Twelfth Plan period, the finances of ULBs should be strengthened with a three-pronged approach

- create robust tax and non-tax based revenue streams for ULBs;
- attract private capital to the urban sector; and
- systematically monetise land.

18.61. A major strategy under the Twelfth Plan would be to strengthen the municipal finances and make them predictable through suitable reforms under JNNURM. This is necessary for attracting private funds for urban infrastructure. To this end, the following initiatives must be undertaken by the central and State Governments.

Institutionalise the Revenue Streams for ULBs

18.62. The Ministry of Urban Development should facilitate the process of making a Constitutional Amendment that clearly outlines the various tax and non-tax revenue streams for ULBs through the incorporation of a Local Bodies Finance List in the Constitution. In addition to property, entertainment, professional, motor vehicle, advertising tax and stamp duty, the amendment should also entitle the ULBs to collect appropriate user charges, trade license fees and use land-based instruments to augment their revenues. It must ensure that all taxes are regularly revised using scientific principles such that they serve as relevant sources of funds for ULBs.

Ensure Revenue Sharing from States to ULBs

18.63. According to HPEC, States should share 25 per cent of the GST equivalent with urban and rural local bodies, and this should be enforced through an appropriate constitutional mechanism. HPEC's recommendations in this regard are given in the Box 18.6.

Ensure Generation of Non-budgetary Revenues through Innovative Measures Including Monetisation of Land

18.64. Additional FSI that is given beyond what is normally prescribed should be charged for adequately. Such charges should be a part of the balanced strategy for expanding the effective supply of prime land going hand-in-hand with the strategy for creating 'virtual land' in the required location by building tall. The charges for additional FSI and land-use conversions should be determined professionally and should be at least 50 per cent of the actual land value in the concerned area. Apart from FSI, ULBs should also use various other land value-based instruments like betterment fee, land use conversion charges, impact fees and development charges that should be parked in a ring fenced city development fund and used for developing the required urban infrastructure in the city.

18.65. To enable land monetisation, a comprehensive and transparent framework should be put in place with the following features:

Box 18.6 Recommendation of Isher Ahluwalia Committee on Financial Devolution to ULBs

The Committee recommends more broad-based revenue sharing by States with ULBs through appropriate amendments of the Constitution/other measures so as to:

- Insert a 'Local Bodies Finance List' (LBFL) along the lines of the Union and State Lists
- Empower ULBs to exclusively levy property tax, profession tax, entertainment tax and advertisement tax and retain the whole of their proceeds (hereinafter referred to as 'exclusive taxes'). In case States continue to levy and collect profession tax or entertainment tax, then the entire revenues, net of collection cost, should be passed on to the ULBs
- Constitutionally ensure sharing of a pre-specified percentage of revenues from all taxes on goods and services (including motor vehicle tax and stamp duty) which are levied by States to enable ULBs to meet their functional responsibilities assigned to them by the 74th Amendment (hereinafter collectively referred to as 'revenue-shared taxes')
- Provide for formula-based sharing of the divisible pool with the ULBs and also grants-in-aid to ULBs from the divisible pool for bridging, wherever necessary, horizontal fiscal imbalance;
- Provide that the devolution in (c) above shall be on the basis of a formula designed by the SFC, taking into account the level of economic activity, population levels, extent of poverty, capacity to mobilise resources and other factors as may be necessary over time.

The Committee also recommends that States should strengthen SFCs by improving their capacity, following the recommendations of the thirteenth CFC. They must also ensure that the recommendations of SFCs are given the same level of consideration as the recommendations of the CFC to the Government of India.

Source: HPEC Report (2011).

- Development Plans should be prepared using a standardised approach on a regular basis
- Land-use patterns must be maintained as per approved Master Plans
- The process of land development should be strategically sequenced to generate resources for infrastructure creation
- Roles and responsibilities of Urban Development Authorities and ULBs in the land management process must be clearly delineated

Increase User Charge Collection

18.66. ULBs should levy user charges for all measurable services where beneficiaries are easily identifiable. Appropriate level of user charges should be determined based on actual service use, and regulated by the proposed municipal services regulator. These charges should not only cover the O&M costs, debt servicing costs and depreciation, but also provide a minimal profit to the ULBs to facilitate creation of an equity base for ULBs over time. Also, there should be a tiered structure of user charges, where higher levels of consumption should be charged a higher tariff.

Establish a Comprehensive Approach to Facilitate PPPs

18.67. As much as 13–23 per cent of investments in urban infrastructure in the Twelfth FYP can be raised through public private and people partnerships. This should be done under an extended '4P' framework—*People-Private-Public Partnerships* as experience across the world indicates that in urban renewal and management, the role of 'People' in design of projects and partnerships is crucial, much more so than in large infrastructure projects such as highways, airports, power, power plants and so on, in which 'People' have a relatively limited role in the ongoing governance of the projects and their outcomes. Therefore, best practices and model documents for 'PPPP' must be evolved and deployed for India's urban management agenda to succeed. This would improve the ownership of these projects and would facilitate an effective R&R component of the project. These PPPP projects may become more viable if a subvention from property and other urban taxes is imaginatively used to meet any financial gap in the projects where felt necessary (refer Box 18.7).

Box 18.7 PPP in Urban Sector under JNNURM

It has been estimated that about 13–23 per cent of the total investment requirement in urban sector can potentially come through PPPs including annuity model. This would roughly translate to about 250–300 PPP projects in urban sector each year.

JNNURM-I was the first major initiative which encouraged PPP in urban sector. Forty-nine projects involving total project cost of about ₹5,458 cr were taken up under PPP framework in sectors like solid waste, water supply, sewage and urban transport in which private concessionaire brought in investment of ₹1,066 crore.

A major factor that has prevented mainstreaming of PPP framework in urban sector is that given low user charges, very few projects are financially free standing and sustainable on the basis of user fee alone. PPP projects in urban sector would require relatively higher degree of government support and may be broadly classified as follows:

- Projects which are free standing, usually based on user charges, sometimes combined with Viability Gap Funding (VGF) or revenue streams from real estate
- Revenue linked to a performance based unitary charge (tipping fee for instance) with a minimum throughput assurance
- Revenue linked to a performance based periodical payment (annuity payment)
- Projects having little or no capital investment from private sector but designed to bring in efficiency improvements: for instance management contracts

Experience in other infrastructure sectors especially highways have shown that beside enabling environment, standardisation of bidding documents is key to encourage PPP projects. Such standardisation leads to greater certainty, broad public acceptability, reduction in transaction costs and time besides addressing the issue of capacity constraint.

Under the Twelfth Plan, there is need to develop such model documents for PPP projects in urban sector including:

- Water supply
- Urban waste management including solid waste and sewerage
- Urban transport
- Social sectors like Health care and education
- Affordable housing

Another important aspect in designing a PPP project is to ensure participation of people so that the project has the requisite ownership.

Set up a 'Ring-Fenced' City/State-level Development Fund

18.68. Set up a city/State-level development fund:

Proceeds accruing to ULBs from innovative sources like land monetisation and other land based instruments should be pooled into a 'ring fenced' city development fund and then used only for urban infrastructure projects and projects for providing shelters to the urban poor in respective cities and not for any other purpose. In view of the capital intensity of transport projects, it is suggested that the fund may have two parts—(i) Fund marked for urban transport projects and (ii) fund for other infrastructure and shelter related projects. To start with, such funds may be created in metropolitan cities. To meet the demands of smaller ULBs, each State should set up a State Financial Intermediary, on the lines of

Tamil Nadu Urban Development Fund (TNUDF), which can then pool funding requirements of the ULBs in the State and provide economies of scale.

Empower ULBs to Leverage Municipal Bonds Including Pooled Financing

18.69. A handbook should be created based on consultation with key stakeholders that specifies regulations relating to lenders and lending instruments, mixed or shared authority and responsibility between the Central and State Government and the ex ante borrowing activities of municipalities and ex post procedures relating to municipal default and insolvency.

Bolster State Finance Commissions

18.70. The State Finance Commissions (SFCs) need to be further strengthened for financial devolution

and imparting predictability to the municipal finances. For efficient functioning of the SFCs, there is a need for revamping MIS at municipal level. Suitable assistance for strengthening of SFCs and creation of municipal level MIS should be admissible under capacity building component of JNNURM.

Building Capacity for Managing India's Urbanisation

18.71. Lack of sufficient capacity across all levels of Government is a root cause of India's urban development challenges. The Mid-term Appraisal of the Eleventh Plan highlighted that many States have lagged in programme utilisation due to inadequate capabilities of governance and management. Traditionally, capacity building, though critical, has been given low priority, which is evident in the absence of dedicated municipal cadres and robust urban management structures. Substantial skill gaps exist across almost all areas of urban management. This is driven as much by the lack of credible and specialised supply side institutions as it is by poor demand from those responsible for urban management in cities. Addressing the capacity deficit must be a key endeavour during the Twelfth FYP and the following strategies should be adopted to achieve this:

Create a Comprehensive Capacity Building Strategy

18.72. The Central Government should create a comprehensive framework that addresses issues such as staffing, training and skill development and finances. This framework should then be used by the States to evolve a capacity building strategy for all their ULBs detailing staffing norms, cadre rules that reflect service delivery and governance norms to be met by ULBs. This strategy should dynamically meet future needs, incentivise knowledge and skill development and provide an environment for using the acquired skills. State strategies should translate into ULB level implementation plans for capacity building. In view of its centrality to India's urban agenda, a separate sub-mission for capacity building, with 10 per cent of the overall funds should be created under the renewed JNNURM.

18.73. The wide-spread need and extreme urgency for urban management capabilities to catch up with

the relentless process of India's urbanisation, makes a 'Just-in-Time and Task-Aligned' approach imperative to build capabilities. In a 'Just-in-Time and Task-Aligned' approach, functionaries are provided requisite tools and skills as they get to do the tasks, rather than acquiring these only through 'remote' training programmes not synchronised with action requirements. Therefore, the training process must be flexible and accessible. IT-based training systems enable this.

18.74. Key elements of capacity building could be as follows:

Institutionalisation and Professionalisation of Municipal Cadre

18.75. Every State should institutionalise a dedicated municipal cadre with necessary technical skills. The cadre should cover the key areas of urban governance and be equipped for increasing complexities of modern city management. State Governments should suitably frame the recruitment rules including norms for direct recruitment to ensure that the cadre attracts top-quality talent. A career path should also be put in place by allowing functionaries to move to higher levels of local bodies based on their experience and should ensure that employees are continuously motivated and recognised.

Leverage Private Sector Expertise

18.76. To meet the skill deficit in the short to medium term, policies should enable recruitment from the private sector and hiring of external consultants through a fast-track process. States can consider creating a list of 'empanelled urban practice professional institutions' to streamline the procurement process and enable ULBs to access external talent in a timely manner.

Establish a Reforms and Performance Cell at the Central Level

18.77. A dedicated unit to address issues such as implementation of reforms, dissemination of best practices across urban issues should be set up under the Capacity Building Mission structure of JNNURM. This unit should comprise urban planners, municipal finance experts, IT personnel, public

health engineers' and others from required disciplines in addition to programme managers.

Launch Five Indian Institutes of Urban Management (IIUMs)

18.78. The Government of India in partnership with State Governments and the private sector should set up five Indian Institutes of Urban Management (IIUMs) over next two Plan periods and at least two in the Twelfth Plan to help prepare future generation of urban managers/regulators with world-class training in urban issues. It is also of utmost importance that these institutions are professionally managed by a joint board of stakeholders having required autonomy.

Facilitate Information Sharing Between Urban Managers

18.79. Strengthen the Urban Resource Link Project, designed by the Administrative Staff College of India in partnership with the World Bank Institute, to provide timely, relevant and quality information related to urban issues to urban managers across cities. Existing city manager associations should also be strengthened and networking opportunities should be created for urban managers to interact and learn.

Use ICT and e-Governance

18.80. e-governance initiatives including Online Project Management Information System should be implemented across all ULBs. There should be a State level nodal agency for implementation and monitoring of all e-governance initiatives within the State. It should also identify the training needs and coordinate with relevant agencies to conduct trainings.

Strengthen Institutions to Cater to Dynamic Urban Needs

18.81. The Ministry of Urban Development and Ministry of Housing and Urban Poverty Alleviation should bolster existing institutions and set up new ones to assist with policy research, design, and implementation as well as to train municipal officials, and elected representatives. Of these at least one to two institutions should have investments and involvement of the private sector.

Reorient the Activities of Existing Organisations namely IIPA, NIUA, RCUES

18.82. The Indian Institute of Public Administration (IIPA) along with the Administrative Training Institutes (ATIs) should be tasked with the preparation of standardised training modules and testing of training modules before they are circulated across the country to ensure they are in synchronisation with current requirements. The National Institute of Urban Affairs (NIUA) focus should be renewed such that it is capable of assisting the MoUD with policy formulation, providing advisory services to States on a variety of urban governance dimensions, and implementing high end capacity building activities for policymakers. The Regional Centres of Urban and Environment Studies (RCUES) should conduct active research related to policy support to cities and also disseminate various policies and programmes of Government of India and State Governments. These centres should carry out capacity building programmes in respect of new initiatives and priorities identified by the MoUD.

Enter into PPP Arrangements for Capacity Building

18.83. The Government's network of 1,817 Industrial Training Institutes (ITIs) and the 3,338 Industrial Training Centres run by the private sector could be roped in to up-skill and re-skill ULB personnel.

18.84. In conclusion, it must be reiterated that a modern 'Just-in-Time and Task-Aligned' approach is required to ensure that supply-side capability building institutions meet the demand side needs rapidly and effectively. India's urbanisation is unstoppable. Urban managers will have to learn while doing.

Leveraging Innovation to Solve the Challenges of Urbanisation

18.85. Managing India's ongoing urbanisation will place huge requirements on financial as well as human resources in the country. Given the scarcity of resources in the medium term, innovation will have a significant role to play. In the Twelfth Five Year Plan period, it is critical to promote innovation and research in several ways :

Provide Support and Incentives for Innovation

18.86. Given the huge requirement of funds, it is critical to incentivise cost reducing innovations in the fields of materials and processes. The support can be in the form of incubation assistance and low cost funds. Incentives could be in the form of recognition and rewards.

Use Technology Extensively in Urban Management

18.87. Technology can unlock significant potential in building capacity across the ULBs. Innovative uses like, self learning packages which simulate real life situations relating to operations and maintenance can be developed in areas like water supply and sanitation, solid waste management and urban planning.

Recognise and Replicate Innovation

18.88. Creating innovative solutions is not enough. These solutions need to be spread across the country to maximise impact. Various approaches to identify, and spread the use of innovations should be institutionalised. These would include ‘innovation and best practices’ portals. The portals created by the national Innovation Commission can provide a platform. The Peer Experience and Reflective Learning (PEARL), platform created by the Ministry of Urban Development under JNNURM whereby cities can learn from each other, will also propagate solutions and its use and coverage should be dramatically scaled up.

SECTOR SPECIFIC APPROACH*Affordable Housing*

18.89. The Technical Group on the Estimation of Urban Housing Shortage has estimated the current shortage of 18.78 million dwelling units. Further, the Group has also estimated that 73 per cent of the shortage in self occupied housing is in bottom 40 per cent of the urban households. The proportion of slum dwellers in large metropolitan areas is higher.

18.90. As against this huge requirement, during the seven years of implementation of the BSUP and the IHSDP component of JNNURM, only about

1.6 million dwelling units have been sanctioned. Given the huge investment required to bridge the gap between demand for affordable housing and its availability, all the costs cannot be borne by the Government and hence the key would be to attract private investment and to enable the beneficiary to increase his/her contribution. A multi-pronged strategy is required to meet the need for housing of the urban poor. First, a facilitative environment must be created by reviewing the regulatory processes governing land use to augment the supply of affordable housing with private capital. Second, encouraging contributions from beneficiaries of the slum—rehabilitation schemes are required for increasing the ownership of the programme. For this, the flow of institutional credit to the urban poor should be ensured. Third, they should be organised in suitable societies and self-help groups. These measures would improve the capacity of urban poor to afford a decent shelter either through incremental improvement of their existing dwelling units or take up shelter on rental basis or new units on ownership basis. Fourth, the Government should continue to undertake and expand the slum rehabilitation programme under the overall umbrella scheme of Rajiv Awas Yojana. Fifth, innovative approaches to facilitate the creation and maintenance of rental housing stock including dormitories should be expressly undertaken to serve the needs of the floating and migrant urban poor. And lastly innovations aimed at low cost housing must be encouraged.

18.91. Availability of land for affordable housing is perhaps the most crucial issue. Progress in implementation of BSUP and IHSDP and now RAY has been hampered by non-availability of suitable land for in-situ slum rehabilitation. The scarcity of land is the result of sub-optimal land-use patterns largely induced by the regulatory regime in place, lack of long term urban planning and lack of participatory planning process to determine the most efficient use of a parcel of land.

18.92. Several strategies can improve land availability for affordable housing and monetise land values for infrastructure. They are as follows:

1. Instead of relying on public land acquisition using the power of eminent domain under the current 1894 Law, which often give rise to discontent, the use of Land Readjustment methods must be extended for land assembly and infrastructure development to the extent possible. India has already been experimenting with a variant of LR in Gujarat's Town Planning Schemes (TPSs). Another ongoing experiment is the improvement of the C-ward in Mumbai that showcases the promises of participatory processes in urban renewal. There is need for scaling such experiments.
2. Adopting mixed land use and subsequently modifying regulations governing land use and removing deficiencies in the urban land market need to be given high priority. In many parts of the country, urban land planning limits redevelopment, modernisation and the repurposing of older inefficient areas. Weak institutional and information foundations still govern land markets. In many cases, urban plans seek to preserve status quo by limiting land assembly and freezing the density of developments by using very low Floor Space Indexes (FSI), and limited coordination with infrastructure development. Under the Eleventh Plan, JNNURM sought to address these issues by incentivising several urban reforms. Completion of reforms mandated by JNNURM must be given priority.
3. Simplification of procedures for conversion of land use and change in building bye-laws have been mandated under JNNURM. These reforms should be completed.
4. JNNURM mandated earmarking at least 20–25 per cent of developed land for housing projects for EWS/LIG category with a system of cross subsidisation. This reform should be completed on priority.
5. As mentioned in paragraph 18.55 above, there is an urgent need for strategic densification of our cities, especially along trunk transport networks and around zones of intense economic activities. Densification would make space available for affordable housing and generate resources for affordable housing. An argument in favour of keeping the densities low is that the existing

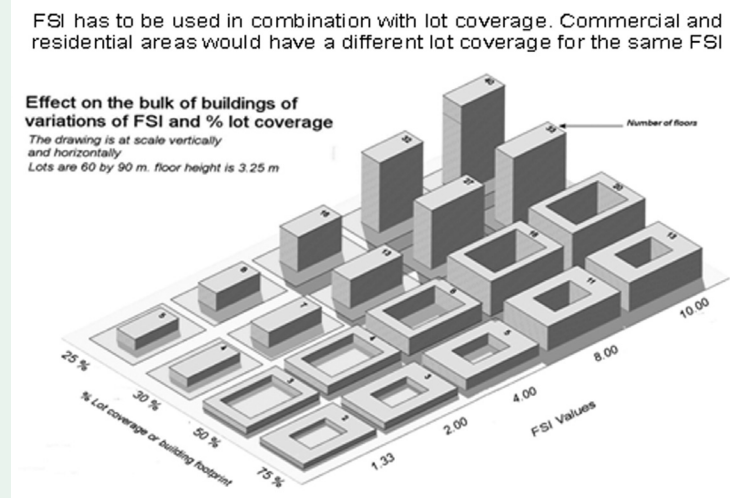
infrastructure systems in cities would collapse if urban densities were increased. While cities do have severe infrastructure limitations, these arguments ignore the opportunities of using increases in land values by strategic densification to finance higher-capacity and higher-quality infrastructure networks and also affordable housing for low-income and moderate-income groups. In addition, compact development fosters increase in agglomeration economies and increased productivity which in turn leads to additional livelihood opportunities. However, care should be taken that the valuation of FARs required for strategic densification is not 'given away'. It has been observed that high FARs are 'given away' in the name of densification, cluster development and redevelopment. These 'give-aways' should be properly valued and put in a dedicated City Development Fund.

18.93. Since land and housing are State subjects, both JNNURM-II and RAY should continue to provide incentives to States to professionalise urban planning and undertake tenuous land-related reforms that reduce distortions in land markets.

Estimation of Budgetary Support for Slum Rehabilitation Programme

18.94. The Isher Ahluwalia HPEC has estimated a requirement of about ₹4.1 lakh crore over the 20 years for the purpose of slum rehabilitation. In addition, noting that about 25 per cent of urban population live in slum, the HPEC recommended that for inclusive growth, out of the estimated CAPEX of 34.1 lakh crore over a period of 20 years, 25 per cent, that is, about ₹8.5 lakh crore should be for slum population, assuming universal standards for all as well as universal provision for access and mobility. However, an objective estimation of the budgetary requirement from Central Government for the Twelfth Plan is difficult because this is crucially linked to the extent of innovation in low cost housing, the flow of private capital for such dwelling units and the extent of contribution from other stakeholders like the State Government, ULBs and the beneficiaries.

Box 18.8 FSI and Coverage Areas Can be Combined to Increase Densities



Source: India Urbanisation Review: Urbanisation beyond Municipalities (2012), World Bank.

18.95. Besides availability of resources, an important element that determines provision of central budget is the capacity available with different level of governments to undertake the activities required. Under the BSUP and IHSDP components of JNNURM, the cumulative expenditure across seven years has been approximately ₹13,000 crore. Despite its superior architecture, RAY has not evoked immediate response from the ULBs or the State Governments.

Schemes for Slum Rehabilitation and Affordable Housing in the Twelfth Plan Period

18.96. The schemes under the Twelfth Plan would be as follows:

1. Rajiv Awas Yojana: Phase-II of the Rajiv Awas Yojana would be launched. Ministry of Housing and Urban Poverty Alleviation should constitute a suitable committee to recommend the design of second phase of RAY by incorporating the learnings from the pilot phase. Phase II of the scheme should retain the principal architectural feature of phase-I of Rajiv Awas Yojana which are as follows:
 - a. It is based on a *holistic approach*: Before seeking assistance under the scheme, all participating cities are required to make a city wide plan for rehabilitation of 'all' slums.
 - b. It mandates *in-situ rehabilitation* of slums so that the livelihood opportunities of their dwellers are not disrupted. In case such slums have to be relocated because the sites at which they are situated are 'untenable', this should be done through a transparent process and the rehabilitations should be planned in close vicinity of the existing slum.
 - c. It mandates *giving 'property rights' to slum dwellers* by suitable enactment within a year of the project being sanctioned. Besides, during this period it also mandates enactment of legislations to earmark 20–25 per cent of developed land for housing projects for EWS/LIG category and earmarking of at least 25 per cent of budget of municipal and other such body which provide basic urban services for urban poor. It also requires the participating States to draw specific time-lines for legislations like modification of the Rent Control Act.
 - d. Central assistance is up to 50 per cent of the project cost.
 - e. The scheme provides for measures to improve the flow of institutional credit to

the beneficiary. These measures are expected to incentivise banks and other lending institutions to provide credit to slum dwellers.

2. Phase-II of RAY would also emphasise following:

- a. *Creation of social/rental housing:* The focus of RAY on provision of rental/social housing stock for the migrant population is a critical element of a long-term preventive strategy. Of the total stock created under RAY, at least 30 per cent should be rental, and 5 per cent should be dormitories. Dormitories can be set up in industrial and commercial areas that see a significant influx of migrant workers.
- b. *Slum-upgradation as the solution of choice and transparent process for determining the tenability of slum rehabilitation:* Resettlement or relocation should be seen as an alternative option only in exceptional situations. A clear policy for in-situ slum upgradation including redevelopment and resettlement/relocation should be evolved by the GoI and implemented in the State as broad guidelines with State-specific amendments as per individual contexts. While evaluating the city wide slum rehabilitation plan, tenability of slums should be clearly identified by the Central Government in consultation with the State Government.
- c. *Building affordable housing stock in peri-urban areas:* RAY should also make provisions for affordable housing for the urban poor in peri-urban areas. The provision of affordable housing in peri-urban areas must be accompanied by the provision of basic services as well as functional transport linkages into the city.
- d. *Encouraging community participation to develop customised approaches for slum rehabilitation related to local needs:* Since a large number of slums are located on prime urban land which has multiple socially productive uses, every effort should be made

to economise on land use through higher FSI. But in doing so it is vital to involve the community in designing slum rehabilitation plans. This should include the involvement of the community in planning, execution, and analysis/feedback of various schemes. Schemes should encourage the creation of Community Based Organisations in slums, federated at a higher level into an association/federation, eventually working to the administrative level of the ULBs with clear-cut, institutionalised frameworks mandating dialogue between ULB level functionaries and the community. The involvement of NGOs in programmes and schemes may be encouraged wherever appropriate to the aims of the scheme. Community-based organisations should be accredited and enabled to play a meaningful role in initiatives such as RAY. This will help such organisations to build on the community mobilisation, participation and social audit, and evaluations guidelines provided for in RAY. Guiding principles for designing slum improvement could include exploring the possibility of channelising community savings, reuse of building materials and other innovative method of reducing the cost of new dwelling units. In those cases where slums are not on prime urban land, incremental improvement in existing dwelling units along with provision of basic services like water supply, sanitation, power connection and so on may be adopted.

- For ensuring convergence with other schemes in the urban sector, RAY should be implemented within the overall umbrella of JNNURM-II. However, the funding pattern of RAY may be different. It should be run in project mode as project-wise involvement of centre in slum rehabilitation is desirable.
- e. *Slum rehabilitation scheme for smaller towns under JNNURM-II:* For the cities not covered under RAY, slum rehabilitation would be taken up under JNNURM-II. This scheme should have the flexibility to undertake new

construction while its thrust should be on *incremental slum rehabilitation* though new constructions as in the case of IHSDP of JNNURM-I would also be an admissible component. The budgetary provision for the scheme would come from the overall allocation made under JNNURM-II.

- f. *Affordable Housing in Partnership*: While under the Twelfth Plan, this scheme may continue to remain dovetailed with RAY, it needs to be completely revamped. Its thrust should be to incentivise the private sector to augment supply of affordable housing in line with the strategy envisaged under the National Urban Housing and Habitat Policy (NUHHP) of 2007.
3. In addition to launching of the aforesaid schemes, following activities should also be undertaken to augment provision of affordable housing:
 - a. *Revitalise and reorient the role of State Housing Boards*: Efforts should be made to reorient the role of State Housing Boards (SHBs) and Development Authorities. They should be encouraged to develop multiple partnerships with the private sector for construction of affordable housing. State Governments should provide the necessary impetus by preparing State housing plans that are integrated into the overall metropolitan/city master plan and outline the roles of the SHBs. They should provide a larger quantum of guarantee to social housing programmes to enable SHBs to access a larger quantum of loan assistance from Housing Finance Institutions. SHBs should also work with the State Governments to acquire land at appropriate locations that can be used for the creation of affordable housing stock. The activities of SHBs can be broad based so that cross-subsidisation opportunities may be made available to them.
 - b. *Promote a corporatised agency for delivery of affordable housing under the Metropolitan Development Authority*:

At the metropolitan level there is no specific agency that is responsible for the delivery of affordable housing stock. The State Government may constitute a corporatised agency that functions with an empowered board and steers the development and delivery of such stock in the top 20 to 30 metropolitan areas.
 - c. *Accredit community-based organisations*: Community-based organisations should be accredited and enabled to play a meaningful role in initiatives such as RAY. This will help such organisations to build on the community mobilisation, participation and social audit, and evaluations guidelines provided for in RAY.
 - d. *Promote PPPP for affordable housing*: Further measures to facilitate private sector participation should be introduced. This should include capacity building and legislative arrangement for rolling out PPP projects for providing affordable housing. Additional FAR grant and the provision of using some part of the developed area for commercial purposes could be provided to developers interested in slum redevelopment projects targeted at the EWS and LIG segments. The ISSHUP scheme which provides interest subsidy on housing loans to EWS sections should also be reoriented to facilitate PPP models.
 - e. *Increase the corpus of the Credit Risk Guarantee Fund*: The credit mortgage fund launched under RAY should also be extended to cover any slum rehabilitation schemes undertaken by the Central Government. The corpus should be suitably enhanced and the policy should be fine-tuned such that allocated funds are used to underwrite similar funds created for this purpose by the private sector. This will generate significant additional capital for the sector and stimulate on-the-ground demand for affordable housing stock.
 - f. *Simplification of the process of approval for projects of affordable housing*: Delay in approval process not only acts as a

disincentive for the flow of private capital, it makes assembly of land more difficult besides time and cost overrun.

Urban Transport

18.97. Importance of an efficient urban transport system which is cheap, safe and reliable can hardly be overemphasised. The National Urban Transport

Policy 2006 calls for increasing the share of public transport in our cities from 22 per cent to 60 per cent. The achievements under the Eleventh Plan especially in terms of an extension of metro rail network and provision of projects as well as buses under JNNURM to improve public transport need to be further built up under the Twelfth Plan (refer Box 18.9).

Box 18.9

Metro—A Transformational Approach to Public Transport

High capacity Metro rails are already in use in India and are proving to be successful in addressing the issues of public transport. However, it is a highly capital intensive mode of transport and hence should be first deployed in large metropolitan areas.

When to Deploy a Metro Based System?

Given the high capital costs, high ridership is a must for a metro system to become economically viable. Ridership is a multi-determinant variant that includes population, disposable income per capita, city densification, availability and opportunity cost of land, morphology of the city, and more importantly, the aspirations of people revealed through political demand.

A metro rail project is recommended in cities which ordinarily have:

- Peak hour peak direction traffic (PHPDT) of more than 20,000 for at least 5 kms of continuous length by 2021
- Total population of more than 2 million as per 2011 census
- Average trip length of more than 7–8 kms for motorised trips
- At least 1 million ridership per day on organised public transport

These criteria are in the nature of guidelines and are not to be construed as entitlement for a metro project. As huge public money is involved in construction of these projects, in all such cases, in the first instance, feasibility of relatively cheaper options should be examined.

However, it is recognised that in some cases, especially along busy corridors, difficulty and cost involved in acquisition of land may make metro rail projects a better option. In addition, surface vehicular transport system in general are less energy efficient and cause pollution especially along busy corridors where rail based systems are the best option. Hence, there is a need for a thorough cost-benefit analysis to choose an optimum mode of transport to ensure value-for-money.

Funding the Investments for Metro Systems

Global experiences suggest that metro rail transit systems have largely been developed by the public sector (an analysis of 132 cities worldwide shows that 113 cities (~88 per cent) have metros which are developed and operated in public sector mode). As MRTS alignment usually result in a significant rise in value of the real estate along its zone of influence, Government entities promoting metro rail have used this resource to fund other urban infrastructure. The efficiency gains through PPP have been brought in at the O&M stage. However, given the huge requirement of capital and willingness as well as capability of the private capital to undertake such projects, in high-density corridors, projects which are viable on their own (with admissible Viability Gap Funding and commercial utilisation of land ordinarily required for the project) may be encouraged under PPP mode. However, projects which are financially unviable without providing additional real-estate development rights and so on, should primarily be funded by Government. The central Government may suitably contribute in funding such projects preferably by way of making grants. Appropriate arrangements however need to be placed for densification across such corridors and use of the enhanced value of the real estate for funding other infrastructure projects. Wherever projects are to be developed under public sector, apart from grant, long-tenured debt financing should be facilitated through Government guarantee.

Quality and Affordable Public Transport

18.98. A study (2008) conducted by Ministry of Urban Development estimated that public transport had accounted for only 27 per cent of urban transport in India. The same study also estimated that in cities having population more than 1 million, the share of public transport is even lower. Promoting public transport in a big way with an approach of transporting people rather than vehicles is therefore not an option but is central to any strategy to make cities sustainable and efficient. Hence under the Twelfth Plan, the aim must be to raise the share of public transport to at least 50 per cent of all motorised trips.

18.99. This would require appropriate legislative, institutional and financial arrangements under the plan. Besides incentives for promoting public transport, effective measures are needed to disincentivise the use of private transport, along with creation of an affordable and efficient public transport network.

18.100. The measures recommended for the urban transport sector are:

1. Strengthen UT Wing in MoUD

18.101. Being capital intensive by nature, urban transport will attract the highest share of investment in the urban sector in the coming years. A key challenge is to generate non-budgetary resources to fund these projects, especially through land-based instruments. To manage this scale and complexity, it is recommended that the UT wing of the MoUD is appropriately strengthened with a full time Additional Secretary in-charge to exclusively focus on urban transport issues and drive its implementation across the country. MoUD should suitably initiate a proposal in this regard.

2. Constitution of National Urban Rail Transit Authority

18.102. Currently the Metro Act 1978 provides for formations of a Metro Advisory Board for every Metro project to assist the Government in implementation and running the project. In view of the growing importance of rail-based mass urban transit, there is a requirement of a national level organisation for research, drawing of specifications and

standards, developing appropriate financing model of MRTS projects and so on. The Ministry of Urban Development should initiate a proposal for setting up an apex institution namely the National Urban Rail Transit Authority (NURTA) to promote rail-based mass urban transport in the country. The major functions of the Authority would include:

- a. Advisory services to centre, States and Urban local bodies by emerging as the knowledge and resource centre for rail-based urban transport excluding the sub-urban railways which are under the Ministry of Railways
- b. To draw specification and standards for rail-based mass transport system and determine the service level benchmarks for these systems
- c. To develop alternative financial models for funding the rail-based projects
- d. To develop capacity across different levels of government to roll out rail-based urban transport project on PPP basis. In this regard, to develop model bid documents
- e. To promote research and innovation in rail based urban transport system

3. Setting up of a Research Centre for Rail-based Urban Mass Transport System

18.103. The Ministry of Urban development should initiate a proposal for setting up a Centre of excellence for rail based mass transit system which should promote research in all the major components of such system viz. civil network, rolling stock, tracks and signalling. Fostering innovation in such capital intensive systems would reduce dependence on imports for projects in the country and would help India emerge as an exporter of these equipments. The aforesaid research centre may also become a resource centre for the proposed National Urban Rail Transit Authority.

4. Promote High Speed Urban Rail and the Regional Rapid Transit System

18.104. Linking the core of large cities with their periphery through a fast and efficient transport system has the potential to unlock significant gains and reduce the transport related bottlenecks. As the disposable income rises, citizens value their time and

are likely to be willing to pay higher fare. This also offers the opportunity for transit oriented development and promotes efficient land use. Besides inducing growth in satellite towns and peri-urban areas which are zones of intense economic activities, this also reduces congestion in the core of the city. As the experience of metro rail in India has shown, such transport networks are safe and have enabled the citizenry, especially women to participate more effectively in the economic activities of a city. The Ministry of Urban Development should explore such possibilities of developing rapid transport system and develop financial models for funding these projects through capture of value of the real estate along the alignment with an aim to reduce budgetary requirements.

5. Intelligent Transport System and Seamless Integration of Different Modes through Smart Card

18.105. Use of IT based applications for making public transport more efficient should be an integral part of any urban transport project. Already, in the Eleventh Plan, significant progress has been made in drawing City Mobility Plans and integrating various modes of transport. This initiative should be expanded in the Twelfth Plan to have a Common Mobility Card across all operators and all modes including parking.

6. Policy to Disincentivise Usage of Private Vehicles

18.106. Based on the 'polluter pays principle' it is recommended that an additional urban transport tax may be considered on private vehicles. This tax can be levied on an annual basis and can be collected through insurance companies for existing vehicles and directly on the purchase of new private vehicles. As the coverage of public transport improves in Indian cities, suitable disincentive to private cars may be introduced. Congestion pricing may also be explored as a means to reduce or stagger traffic on busy corridors and generate revenue for further expansion of public transport.

7. Social and Gender Auditing of Transport Projects

18.107. It is necessary that the benefits of urban transport projects are shared by all. Hence, choice of

alignment and timing of running the trains or buses should be carefully done so that poorer sections of the society and workers in the informal sector are given priority as these sections are wholly dependent on public transport unlike the relatively richer sections which have other options. Besides, the safety and security of public transport is of prime importance. The Ministry of Urban development would issue detail guidelines for social and gender auditing of the outcomes of urban transport project.

8. Promote Non-motorised Transport (NMT)

18.108. NMT such as bicycles, pedal rickshaws and pedestrianism are affordable, environment friendly and promote healthy living. They are particularly suitable for short trips, especially for last mile connectivity. Despite these obvious advantages, these modes have suffered from policy neglect. Urban planning in many cities has not made any provision for dedicated tracks for these modes. Consequently, safety concerns have prevented many citizens from switching over to NMT. MoUD should bring out a comprehensive set of guidelines to incentivise NMT under JNNURM-II. For instance, while renovating arterial roads or new road projects, it should be ensured that the project provides for pedestrian path and bicycle lanes, wherever the space permits. Innovations in improving designs of NMT like pedal rickshaw should be suitably incentivised.

9. Create New Departments of UT in State Urban Development Ministries

18.109. States should institute a dedicated department for urban transport within the Municipal Administration and Urban Development ministry. This will help bring focus on the urban transport agenda for the State at large and key cities in particular. Ministry of Urban Development could suitably take up the matter with State Governments.

10. Institute a Safety Commission for Rail/ Guided and Road Transport

18.110. Safety is a critical issue in urban transport. For rail based mass rapid system, the Central Safety Commission should be appropriately strengthened. For road based system, State-level commissions may be set up for performing safety audits.

11. Promote PPP Arrangements, where Appropriate

18.111. Given the huge requirement of capital and willingness as well as capability of the private capital to undertake urban transport project, promoting PPP could be a key priority. All metro projects which are in high density corridors, and are viable on their own (with admissible Viability Gap Funding and real estate development on land ordinarily required for the project) may be encouraged under PPP mode. However, projects which are financially not viable without providing additional real-estate development rights and so on, should primarily be funded by Government. The central Government may suitably contribute in funding such projects preferably by way of grants. Similarly PPP arrangements in bus transport systems based on a gross cost model should be encouraged. The O&M of metro rail projects as well as BRT projects should also be entrusted to the PPP concessionaire to bring in the efficiency gain. For successful implementation of the PPP projects, specification of the service standards, outcomes and its monitoring would be the necessary prerequisite to ensure value for money.

Schemes and Projects for Urban Transport in the Twelfth Plan Period

Requirement of overall Capex Investment

18.112. For 20 years period beginning the first year of the Twelfth Plan, the requirement of Capex (at 2009–10 prices) estimated by the Isher Ahluwalia HPEC for urban transport from all sources are given in the Table 18.2.

18.113. For the Twelfth Plan period, the working group constituted by the Planning Commission on financing urbanisation worked out the requirement of investment for the urban transport sectors (refer to Table 18.3).

Schemes/Projects

18.114. In view of the importance of the urban transport, schemes/projects under the Twelfth Plan would be as follows:

1. *JNNURM-II*: as described in para 18.143 to 18.167, the assistance under JNNURM would be released to the city through concerned State

TABLE 18.2
Estimates of Urban Transport Investments by HPEC

Sector	Investment from all sources (in ₹ Cr) over 20 year period	% share in investment in urban sector
Urban Roads	17,28,941	55.8%
Urban Transport	449,426	14.5%
Traffic support infrastructure	97,985	3.2%
Street lighting	18,580	0.6%
Total	22,94,932	74.1

TABLE 18.3
Requirement of CAPEX

Annual Cap Ex (₹ Crore)	Requirement of CAPEX across different sectors in urban area					
	2012	2013	2014	2015	2016	Total
Urban Roads	29,842	35,214	41,552	49,032	57,858	2,13,498
Mass Transit	7,757	9,154	10,801	12,745	15,040	55,497
Traffic Managements Systems	1,691	1,996	2,355	2,779	3,279	12,100
Street Lighting	321	378	447	527	622	2,294
Capacity Building (urban transport)	1,000	1,000	1,000	1,000	1,000	5,000
Total	40,611	47,742	56,155	66,083	77,799	2,88,389

Governments as long as they adhere to the approved development plans, meet the reform related conditionality as well as mutually agreed financial parameters. Hence all urban transport projects and related activities including provision of buses, which improves public transport are admissible components under JNNURM-II.

2. *Urban road projects*: Of the overall capex estimation for 20 years for the urban sector, HPEC estimated that about 55.8 per cent would be required for urban roads. Since assistance under JNNURM is proposed to be fungible, urban road projects should be admissible under the scheme.
3. *Provision for metro rail projects and RRTS*: Success of the Delhi metro in transforming the public transport system in NCR region has led to demand of metro rail projects from many cities. Considering the long gestation period of conceptualising a metro rail project and arranging funds for it, following is recommended as a guideline for making a city eligible to receive central assistance for metro rail project:
 - Peak hour peak direction traffic (PHPDT) of more than 20,000 for at least 5 kms of continuous length by 2021
 - Total population of more than 2 million as per 2011 census
 - Average trip length of more than 7–8 kms for motorised trips
 - At least 1 million ridership per day on organised public transport

18.115. These criteria are in the nature of guidelines and are not to be construed as entitlement for a metro rail project. As huge public money is involved in construction of these projects, a thorough cost-benefit analysis across available mode of transport is to be ensured in case of every project.

Water Supply, Sewerage, Storm Water Drainage, Solid Waste Management and Environment Sustainability of the Cities

18.116. Safe water and sanitation are public goods as they have very large positive externalities. While access to water supply and sanitation is important for all the urban residents, for the poor, it becomes a

question of basic survival. Lack of safe water and sanitation cause outbreaks of epidemics and Indian cities are every year affected by this. The impact of epidemics on the poor is much larger than on the non-poor for many reasons; firstly epidemics break out in areas where the poor live, their access to safe water and sanitation is far lower than non-poor and their nutritional status being poor they easily succumb to the epidemics than the non-poor. Thus, lack of safe water and sanitation cause health disorders and keep the mortality rates high in general and among the poor in particular. On the other hand, it has been estimated that access to water increases the productive working hours of the urban poor in general and the poor women in particular by 1.5 to 2 hours. Access to water and sanitation has positive impact on overall health and decline in disease burden reduces household expenditure on health and that itself has positive impact on household income. It is well known that higher incidence of morbidity pushes low income households below the poverty line.

18.117. The central assistance to States and ULBs for improving these services would be within the overall umbrella scheme of JNNURM-II. Besides, the focus of the Plan should be to bring about structural and governance change at ULB levels and to build capacity so that these services are provided on a sustained basis. This would be incentivised through a set of reforms related to water and sanitation and providing assistance to the cities conditional to progress in achieving reforms.

Water Supply

18.118. Following should be the target for the Twelfth Plan period:

1. *Universalisation of water and sanitation to urban areas*: This involves the universal coverage of all urban population for the minimum levels of safe drinking and household-use water along with a clean toilet, sewerage, storm water drainage and solid waste management. The provisioning of basic water and sanitation should be de-linked from issues of land tenure and legal status. These services should be provided on the clear understanding that this provision does not

automatically translate into legal entitlements in other spheres, especially as regards legal rights to the land and/or dwelling space. Further any decisions as to whether the slums are to be legalised or not should be made irrespective of the provision of basic services.

2. *Reduction in unaccounted for water:* A systematic approach for identification and reduction of leakage and preventive maintenance would be promoted as an integral part of the operation and maintenance of the water supply system on a regular basis. This would help save precious quantities of treated water and increase revenues to make systems self-sustaining. Such measures can often obviate the need for immediate augmentation of capacities of the existing schemes, which are very often quite capital intensive, while triggering significant improvements in service delivery.
3. *Hundred per cent metering of water supply:* Metering is essential for recovery of reasonable user charges and conservation. It acts as an incentive for those who wish to conserve water and a disincentive to those who waste water. Metering helps increasing the total quantum of water available and consequently increases the quantum of water available for supply and increases the overall revenue. Metering also leads to reduction of wasteful use of water and increases efficiency and sustainability of the water supply system that is an important O&M function.
4. *Ensure 24 × 7 water supply:* Yet another priority is to move towards continuous water supply. Intermittent supply leads to sucking of external pollution into the system during non-supply hours due to inadequate pressure, causing health hazards.
5. *Address structural dysfunctions through reforms mentioned in Box 18.10:* For meeting the aforesaid target, it is necessary that structural issues facing the sectors are addressed through completion of reforms mandated under JNNURM. These issues include high levels of non-revenue water, low level of metering, intermittent supply, inadequate quality, low sustainability and so on. The poor, particularly those living in slums and squatter settlements, are

generally deprived of potable water. The implementing Ministry would work with States and ULBs to introduce operational, financial and institutional reforms related to water sector and these reforms under JNNURM-II.

18.119. Water is an extremely valuable but scarce resource and should be treated as such. In this connection following are recommended:

1. *The issue of allocation of water resource between rural and urban India needs to be addressed in ways that reduce intra-national tension:* In many instances, growth of urban and industrial sectors increases consumption of water which may give rise to conflicting claims on allocation of water across different sectors. It is imperative that while all efforts are made to conserve water for augmenting its availability, Indian cities and industries reinvent their water strategy with an aim to grow with minimal water and minimal waste generation.
2. *To cut the costs of water supply and distribution losses, focus on building, renewing and replenishing local water sources, including groundwater:* As cities expand their water footprint which implies sourcing water from distance sources, the cost of water supply as well as transportation losses and leakages rise. Committing a larger capital investment in creating such infrastructure also leaves utilities with very little money to maintain these networks which further compounds the problem. It is necessary therefore that all efforts should be made to develop a source of water close to where people need supply. The city sources are its water bodies, which capture rain or floodwaters from rivers as well as its underground water aquifers. There is an urgent need to protect and nurture these sources. Such measures may include bringing specific legislations apart from taking up specific projects under JNNURM-II.
3. *Include ground water in water supply calculations:* While preservation and recharging of ground water are increasingly receiving attention of city planners, there is a tendency to exclude this source from urban water planning.

In absence of universal access to piped water supply, people are forced to rely on ground water extraction. Another problem is perverse incentivisation for substitution of piped water supply by ground water extraction in case the water tariff is perceived to be high. There is therefore an urgent need to map groundwater and include this resource in water planning of a city for its sustainable utilisation.

4. *Take an integrated view of water supply and sanitation:* Investment in sewage should be a function of investment in water supply as any augmentation of water supply also leads to increase in sewage generation. It is, therefore, necessary that planning of a water supply project should also include provision for treatment of sewage. Discharge of untreated sewage, besides making cities and our water bodies unhygienic also significantly raises the cost of treatment of water. The guiding principle should be to incentivise cost saving innovations in building sewage network, reducing the length of sewage network and treating waste water as resource by turning it into water for irrigation or use in the industry.
5. *Set real and hard targets for affordable recycling and reuse of treated waste water:* Recycling and reuse of waste water is already in practice. This is required to be scaled up in a planned way. Reuse of waste water after its treatment in agriculture and other sectors should be properly planned for optimal utilisation of this scarce resource (refer Box 18.10).

Sewerage, Drainage and Solid Waste Management

18.120. The Ministry of Urban Development should work towards the implementation of the National Urban Sanitation Policy. Cities should be encouraged to formulate city-wide sanitation plans and all the States shall be encouraged to adopt State Sanitation Strategies. These activities should be supported under JNNURM-II.

Reuse Treated Sewage for Industrial Applications

18.121. Cities should be encouraged to meet part of their water supply, at least for industrial use, by reusing/recycling waste water. Incentives may be

provided to users (through water tariff, property tax and so on) to recycle and reuse treated wastewater. These should also be incorporated in building bye-laws for new constructions.

18.122. Ministry of Urban Development should support these activities through financial and policy support through various schemes. While the major intervention would be under the JNNURM-II for preventing manual handling of human excreta, a separate sub-scheme for achieving the goals of the National Urban Sanitation Policy (NUSP) shall be formulated in the Twelfth Plan.

Solid Waste Management

18.123. Some of the major issues concerning solid waste management are:

1. Absence of segregation of waste at source
2. Lack of funds for waste management at ULBs
3. Lack of technical expertise and appropriate institutional arrangement
4. Unwillingness of ULBs to introduce proper collection, segregation, transportation and treatment/disposal systems
5. Indifference of citizens towards waste management due to lack of awareness
6. Lack of community participation towards waste management and hygienic conditions

18.124. As a general approach, Ministry of Urban Development should work with the States to explore the following strategies:

- The recovery of recyclables is presently being done in an unorganised manner. This needs to be replaced with informal arrangements of rag pickers and NGOs/CBOs who could also be involved for facilitating effective door-to-door collection.
- Acquisition/earmarking of land required for the project should be facilitated by proactive guidelines/direction from the State. A Master Plan process should actively address this requirement.
- The concept of regional solid waste management solutions needs to be encouraged. This has been taken up in Gujarat with a view to achieving economies of scale.

Box 18.10 Reforms and Desired Outcomes Related to Water Supply and Sanitation

Reforms (water and sanitation sector)

- Enact bylaws for reuse of recycled water
- ULBs to ensure accountability of the water supply utility by drawing service level agreements with them
- Have road map for bringing down wastage
- Prepare a detailed database for the city relating to water supply and regularly update it
- Draw up a roadmap, that is, city sanitation plan in accordance with the Urban Sanitation Policy
- Prepare a sewage master plan for the city
- Draw-up a roadmap for achieving Service Level Benchmark
- Set tariffs on a scientific basis with cross subsidised* tariffs for the economically weaker sections
- Have an effective grievance redressal mechanism
- Draw-up demand management measures
- Formulate ground water use by laws and enforce effectively energy conservation measures especially in pumping

* In general, since the charge can be only for water and one time sanitation connection charge, the charge for water must therefore cover O&M + Capex for water and sanitation for all categories. For both water and sewerage, subsidy can be in terms of low charges for the first x litres of water and higher than normal for the rest.

State level reforms

- Set up a regulator for the sector
- Introduce policies to augment bulk water and resource allocation plans in alignment with the basic requirements of the city
- Transfer the water supply function fully to the cities
- Follow the three 'Rs'—*Reuse, Reduce, Recycle* policy for waste management based on the quantum generated
- Provide incentives for waste water recycling policy incentives
- Increase resource provision for augmentation of sewage system/toilets for weaker sections
- Prepare a regional solid waste management arrangements (to have larger aggregation and economies of scale)
- Prepare implementable PPP policy for cities

Desired outcome

- Universal Access to Water and Sanitation
 - Hundred per cent Metering of water supply
 - Opt for 24 × 7 water supply wherever possible and feasible
 - Provide for step by step improvement in the operations of the water utility
 - Steadily bring down distribution inefficiencies by bring down wastage of water closer to international best practice. Successful examples of utilities such as Phnom Penh, Manila (East Zone) demonstrate that reduction in NRW levels to below 20 per cent is possible even in developing country contexts
 - Commit to given hours of supply and be accountable for it through citizen charters
 - Commit to quality of water to be supplied
 - Ensure that the cities are free from open defecation and measures for providing toilets
 - Community toilets especially in areas that are home to the economically weaker section
 - Provide sufficient no of public toilets/urinals in city
 - Hundred per cent collection of garbage from houses/establishments and straight transportation for disposal
 - Conversion of waste to energy/other forms
- Waste characterisation has to be done properly taking representative samples from the city for various types of wastes and the treatment process should be selected accordingly.
 - Appropriate technology options for treatment of the organic content of the wastes should be chosen based on the physical and chemical characteristics of the wastes and local conditions and so on.

- IEC (Information, Education and Communication) in order to educate households, municipal staff as well as personnel engaged in collection and management of waste about need for segregation at source and improved sanitation is the most important element in success of a SWM project. This must be accorded due and adequate priority.
- Polluter Pay Principle should be implemented in a calibrated manner in order to instil a sense of discipline with respect to throwing of litter by people without any concern for cleanliness.
- In the area of solid waste management, a general approach should be to pursue the concept of 'waste to wealth'. PPP may also be explored/introduced for functions such as door-to-door collection, street sweeping, transportation, treatment and so on.

Storm Water Drainage

18.125. Lack of storm water drainage often exacerbates the sanitation problem in many Indian cities especially during the monsoon months. The problem has its genesis in illegal, unplanned development and encroachment often on natural areas and drainage systems/ways. As the cities develop and grow, benefits from important environmental functions (natural water ways/areas) are often ignored and overlooked as a result of which natural areas are degraded and damaged. This along with the increase in built-up area results in increased incidences of flooding and accompanied ill effects. The densification of cities is leading to construction of roads, buildings which has resulted in increase in impermeable areas. As a result often permanent changes to the catchment are caused, leading to changes in

runoff patterns, which affect the magnitude, frequency and occurrence of flooding.

18.126. Lack of storm water drains lead to water logging every monsoon and outbreak of vector diseases such as malaria, dengue and so on, that afflict the poor the most as the poor live in settlements that are in low-lying and un-serviced areas. However, such epidemics rarely remain confined and easily spread throughout the city.

18.127. The core of sustainable storm water management is to consider storm water as a potential resource rather than as a liability or a waste product. This shift can only be initiated by a visionary storm water management approach which combines the preventive measures with the traditional curative and reactive measures in appropriate sum so as to minimise negative impacts on human, property and environmental health. In this respect, environmental health would include preserving and maintaining the natural hydrological cycle, groundwater recharge, natural drainage system and so on.

18.128. Urban water supply, sanitation and storm water drainage were accorded priority under the Eleventh Plan. Number of projects sanctioned and level of investment in these services under JNNURM are given in Table 18.4.

18.129. At present, a large number of these projects are under various sages of implementation hence their full benefit are yet to be felt. However, given the level of deficit in these essential services and their importance in making a city liveable, they would

TABLE 18.4
Investments under JNNURM

Particulars	UIG		UIDSSMT		Total	
	No. of projects	Cost (in ₹ cr)	No. of projects	Cost (in ₹ cr)	No. of projects	Cost (in ₹ cr)
Water supply	158	20,562	453	8,901	611	29,463
Sewerage	112	14,992	89	2,833	201	17,826
Drainage	73	8,404	67	790	140	9,193
Solid waste management	45	2,091	56	342	101	2,433
Total	388	46,050	665	12,865	1,053	58,915

continue to receive top most priority under the Twelfth Plan.

National Urban Sanitation Policy

18.130. This policy aims at creating cities free from open defecation practices. Under the policy, annual ratings of cities on select sanitation-related parameters shall be carried out and the best performing cities will be recognised. The policy seeks to improve the status of sanitation in the country through formulation of State sanitation strategies, city sanitation plans, and a national awareness generation campaign. The Ministry of Urban Development and the Ministries of Housing and Urban Poverty Alleviation should continue to operationalise the policy under the Twelfth Plan period.

Projected Requirement of Investment

18.131. The Isher Ahluwalia Committee estimated the 20 years investment requirement from different sources as given in Table 18.5.

18.132. The requirement of Capex from all sources for these sectors under the Twelfth Plan as estimated by the Working Group on financing urbanisation is as given in Table 18.6.

18.133. Adopting mixed land use and subsequently modifying regulations governing land use and removing deficiencies in the urban land market need to be given high priority. In many parts of the country, urban land planning limits redevelopment, modernisation and the repurposing of older inefficient areas. Weak institutional and information foundations still govern land markets. In many cases,

TABLE 18.5
Investment Requirement Estimates by HPEC

Sector	Requirement of investment from all sources (in ₹ cr)	per cent share in required investment in urban sector
Water supply	3,20,908	10.4%
Sewerage	2,42,688	7.8%
Solid waste management	48,582	1.6%
Storm water drains	1,91,031	6.2%

urban plans seek to preserve status quo by limiting land assembly and freezing the density of developments by using very low Floor Space Indexes (FSI), and limited coordination with infrastructure development. Under the Eleventh Plan, JNNURM sought to address these issues by incentivising several urban reforms. Completion of reforms mandated by JNNURM must be given priority.

Schemes

18.134. Following schemes should be launched under the Twelfth Plan for assisting the States and ULBs to improve service delivery:

1. *JNNURM-II*: The broad principle on which the scheme is to be launched is given in paragraph 18.143 to 18.167.
2. *National Mission on Sustainable Habitat (NMSH)*: The National Mission on Sustainable Habitat (2010) is one of the eight missions under the National Climate Change Action Plan. The Mission should be implemented in the Twelfth

TABLE 18.6
Requirement of CAPEX as per Working Group

Annual CAPEX (₹ Crores)	Requirement of CAPEX					
	2012	2013	2014	2015	2016	Total
Water Supply	5,539	6,536	7,713	9,101	10,739	39,628
Sewerage	4,189	4,943	5,833	6,883	8,121	29,969
Solid Waste	839	989	1,168	1,378	1,626	6,000
Storm Water Drains	3,297	3,891	4,591	5,418	6,393	23,590
Total	13,864	16,359	19,305	22,780	26,879	99,187

Plan period with the aim to make cities sustainable through improvements in energy efficiency of buildings, management of solid waste, and shift to public transport.

The Mission should broadly cover:

- a. Extension of the energy conservation building code, which addresses the design of new and large commercial buildings to optimise their energy demands
 - b. Better urban planning and modal shift to public transport, that is, making long-term transport plans to facilitate the growth of medium and small cities in such a way that ensures efficient and convenient public transport. These plans should be in sync with the city's overall development plan and be a part of it
 - c. Recycling of material and urban waste management, a special area of focus being the development of technology for producing power from waste
 - d. The National Mission will include a major R&D programme, focusing on biochemical conversion, waste-water use, sewage utilisation, and recycling options, wherever possible
 - e. As JNNURM-II would be launched as an umbrella scheme for urban renewal and as environment sustainability is an important feature, many of the activities envisaged under the NMSH should be taken under JNNURM-II to ensure convergence. Hence, NMSH should essentially be a scheme for taking up pilot and demonstrational projects in cities to promote environmental sustainability. Close involvement of the Central Ministry in such projects is desirable. Hence, the scheme would be run on project mode
3. *Scheme for mechanical cleaning of septic tanks and so on:*
Implementation of Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act 1993 is required to be attached priority as this addresses the age old abominable practice of manually handling the human

excreta. The Ministry of Urban Development should take up this activity within the overall framework of JNNURM in which one-time procurement of the equipments for the purpose is supported.

Alleviating Urban Poverty: Creating Sustainable Livelihoods and Enterprises

18.135. Based on NSSO Report No. 508 (2004–05), it is estimated that the number of urban poor had increased by 34.4 per cent from 1973 to 2004. Approximately 81 million, that is, 26 per cent of the estimated 310 million urban dwellers were below the monthly consumption of ₹539 in 2004–05.

18.136. An important feature of urbanisation in India during the period 1981–2001 was the relatively small contribution of migration to the increase in urban population in India. The HPEC has noted that the evidence in India suggests that the rural–urban differentials in productivity have widened since 1993–94, indicating that there is considerable scope for migrants to take advantage of the higher-productivity non-agricultural sectors if they can be equipped with the skills and education relevant for employment in urban areas.

18.137. At the same time, the poor who are already living in cities are largely employed in the informal sector. Even though they contribute significantly to the economy of the cities, they suffer from multiple deprivations and vulnerabilities that include lack of access to basic amenities such as water supply, sanitation, health care, education, social security and decent housing.

18.138. If cities have to emerge as engines of inclusive growth, the country is required to address the basic needs of the urban poor by equipping them with necessary skills to take advantage of the growth process and at the same time reducing institutional dysfunctions which have been pointed to earlier that hamper inclusive and sustainable development of our urban conglomerations. A multi-pronged strategy is required to meet the following objectives:

1. Accelerate the rate of job creation in urban areas

2. Impart relevant skills to urban poor
3. Facilitate self-employment for urban poor wherever this viable
4. Proactive and mandatory creation/allocation of spaces within city boundaries to ensure livelihood opportunities to the urban poor.
5. Provide basic services to the urban poor, especially through rehabilitation of slums
6. Ensure financial inclusion of urban poor
7. Ensure legislative inclusion of urban poor
8. Facilitate the transition of the urban poor from the informal sector to the formal one and extend the provisions of social security

18.139. For making our cities engines of inclusive growth, in addition to launching of an improved JNNURM-II and RAY, the following schemes would be taken up under the Twelfth Plan:

18.140. The National Urban Livelihood Mission (NULM). This entails revamping the guidelines of SJSRY and enhancing its scope. Its basic thrust would be to build capacities and skills in sectors that have growing employment opportunities and are relevant to local socio-economic conditions. In its design NULM should deal with important issues like financial exclusion, policy and legal exclusion, and lack of access to information and technology, raw materials and markets. It should also develop linkages with the organisations like the National Skills Development Corporation and other private sector organisations including vocational training institutions that can actually train and hire the urban poor to meet their growing capacity needs.

18.141. In addition, within the umbrella of NULM, following two sub-components would be launched.

1. Sub-component for National scheme for support to street vendors
2. Sub-component for assistance to the States for provision of shelters

18.142. To make the scheme more effective, the Ministry of Housing and Urban Poverty Alleviation should initiate proposals to undertake following policy changes:

- a. *Enactment and implementation of a suitable Act on livelihood promotion of street vendors and adoption of a no-eviction strategy by State Governments:* This will enable the creation of physical legal spaces for the informal economy and recognise and support natural markets of street vendors with a non-eviction guarantee. For this, a no-eviction policy should be put in place in combination with a land policy aiming at the provision of developed lands for the urban poor. This strategy should be implemented with the caveat that evictions for the purpose of the common social good may occur, but with provisions for resettlement and rehabilitation of project affected persons. The strategy should also cover Central Government and private lands.

1. *Formalisation of participation of informal workers in the economy:* Informal sector workers should be organised as associations or federations such as trade unions, cooperatives, and must be formally recognised. Similarly workers guilds and self-help groups should be recognised as fee paying organisations and must have the capacity to negotiate with utilities like DISCOMs and water supply boards to provide services at specified locations by paying user charges.
2. *Design of new financial strategies and products to meet the needs of the urban poor:* Typically poor cash flow hinders the success of micro-enterprises, women, children and also those belonging to minorities or SC/ST caste groups. Thus, innovative products and services that help meet the needs of the informal economy, for example, branchless banking, business correspondents and micro-finance should be created. Workers guilds and self help groups should be provided with a package of financial services including micro-credit for working capital and assets, micro-insurance for life, health and livelihoods.
3. *Convergence of schemes for social protection of the urban poor:* A large number of programmes are being implemented by the Government to help uplift poor in the

country. At present, multiple ministries (for example, health and education) are driving separate initiatives aimed at the poor across rural and urban areas. To increase their effectiveness, convergence across these efforts is essential. In addition, ULBs have the potential to emerge as an interface between the citizenry on one hand and the State and national Government on the other for ensuring better outcomes of these initiatives.

JNNURM UNDER THE TWELFTH FIVE YEAR PLAN

18.143. JNNURM which was launched in December 2005 is co-terminus with the Eleventh Plan. Under the Twelfth Plan period, JNNURM-II would be launched as a State sector ACA scheme. The scheme will have a focused approach on urban reforms, capacity building and helping achieve fiscal prudence across ULBs. The salient feature of the scheme and budgetary provisions under the Twelfth Plan period would be as follows:

Objective

18.144. The objectives of JNNURM-II would be as follows:

- Alleviating urban poverty
- Improving service delivery standards in urban areas including basic services for urban poor
- Empowering urban local bodies
- Facilitating participatory governance
- Effectively managing land resources
- Fostering sustainable, inclusive and faster growth

Strategies of JNNURM-II

18.145. To realise these objectives, the key strategies of the programme would be as follows:

- Build adequate capacity including dedicated municipal cadre
- Planned urbanisation by preparing a Development Plan through a participatory process
- Remove distortions in land market
- Establish efficient governance structures
- Promote financial sustainability and accountability of ULBs

- Attract more private investment, in particular, through PPP
- Adoption of service level benchmarks and social and gender audit of the outcomes of programme
- Slum rehabilitation and creation of affordable housing
- Planned development of smaller towns and peri-urban areas
- Incentivising innovation and rapid learnings across urban systems

Components of JNNURM

18.146. The programme should have following components:

1. Urban Infrastructure and Governance (UIG)
2. Rajiv Awas Yojana (RAY)
3. Slum rehabilitation in cities not covered under RAY
4. Capacity building

18.147. The scheme for Urban Infrastructure Development in Satellite Towns should be merged with the sub-mission on UIG under JNNURM-II. Further, while BSUP and IHSDP should be discontinued, RAY should be a sub-mission under JNNURM-II for the purposes of achieving convergence.

Coverage of JNNURM-II

18.148. Under JNNURM-I, a 'Mission city' approach was followed. About 70 per cent of the central assistance was provided to 65 Mission cities. In the Twelfth Plan, adequate attention should also be paid to encourage the medium and small town to realise their full economic potential. Hence under JNNURM-II, the limiting concept of 'Mission cities' should be dispensed with and while all cities should be eligible to participate, a fair system of selection of cities to be covered under the programme should be put in place.

Outlay for JNNURM-II and its Division

18.149. The five year budgetary outlay for JNNURM-II is given in paragraph 18.184. This outlay should be divided between the following:

- Base Fund (80 per cent of the total outlay of JNNURM-II)

- Capacity Building Fund (10 per cent of the total outlay of JNNURM-II)
- Incentive Fund (10 per cent of the total outlay of JNNURM-II)

Capacity Building under JNNURM-II

18.150. Capacity building at different levels of government would be a key focus area under the programme. For this purpose:

- A separate Mission Directorate for Capacity Building and Reform Management should be established.
- Ten per cent of the overall JNNURM fund should be earmarked for capacity building.
- MoUD and MoHUPA should prepare a road map for operationalising the recommendations made by HPEC and the Working Group on capacity building.
- All capacity building efforts currently undertaken by the MoUD and MoHUPA in urban sector may be brought under the umbrella of JNNURM-II. However, capacity building efforts for highly specialised sectors like urban transport (Metro Rail) or for proposed National Urban Livelihood Mission could be run independently though the Ministries should ensure their convergence with the efforts taken under JNNURM-II.

18.151. The main thrust of capacity-building activities would be:

- Creation and professionalisation of the Municipal Cadre
- Identifying the gap in capacity at different levels to establish the demand
- Strengthening the supply side of capacity building
- Opening of suitable institutions in case the existing ones are unable to meet current requirements
- Support to opening of a apex level institutions that have involvement from the private sector and centres of excellence in specific sectors like water supply and sanitation, housing and so on
- Creation of a dedicated PPP cell for developing model bid documents
- Creation of cell on municipal finance and framework for land monetisation and other innovative method of generating finances and so on

- Dissemination of national and international best practices in urban governance
- Conducting annual reform audits to monitor the progress of reforms across participating States and cities

Planned and Holistic Development of Cities under JNNURM-II

18.152. Every town and city participating in the programme would prepare a Development and Financial Plan as provided in paragraph 18.44 and 18.45.

Reforms under JNNURM-II

18.153. Since the engagement of Government of India in the urban sector is largely to incentivise the State Governments and ULBs to bring about structural transformation in cities, reforms must remain at the heart of the JNNURM. In addition a robust system of evaluation of reforms should be put in place.

18.154. JNNURM-I has set the stage for attempting second generation reforms. Secondly, since JNNURM-II takes a relatively longer time horizon of 10 years, it provides sufficient opportunity to achieve reforms to even those States which have struggled to make any significant progress.

18.155. All pending reforms under JNNURM-I should become base reforms for JNNURM-II. A few second generation reforms including reforms in water and sanitation sector should be introduced and made mandatory. In view of different level of preparedness for achieving the reforms across cities of different sizes, the required milestones to be achieved in a particular reform should be calibrated according to the size of cities. Besides, since some of the reforms mentioned in the comprehensive list are difficult ones but are transformational in nature, it is desirable to introduce additional incentives for fast tracking such difficult reforms. Their completion should entitle States/ULBs to get additional allocation from the Incentive Fund which is proposed to be 10 per cent of the outlay of JNNURM-II (refer to Box 18.11).

Box 18.11**Reforms under JNNURM Comprehensive List of Reforms in Urban Sector*****ULB Level Reforms (cities having population more than 5 lakh)***

1. Introduce and enhance e-governance system
2. Adoption of accrual based double entry system of accounting
3. Collection of property tax
4. Rationalisation of user charges collection
5. Create a ring-fenced development fund
6. Put in place transparent FAR policies and market value based FAR charges
7. Earmarking of 20–25 per cent of developed land for housing projects for EWS/LIG category with a system of cross subsidisation
8. Internal earmarking within local body budgets for basic service to the urban poor
9. Sector specific reforms of water and sanitation that includes:
 - Enact bylaws for reuse of recycled water
 - Ensure accountability of the water supply utility through service level agreements with ULBs
 - Draw road map for bringing down wastage
 - Prepare a detailed database for the city relating to water supply and regularly update it
 - Draw up a roadmap, that is, City sanitation plan in accordance with the Urban Sanitation Policy
 - Prepare a sewage master plan for the city
 - Draw-up a roadmap for achieving Service Level Benchmark
 - Have an effective grievance redressal mechanism
 - Draw-up demand management measures

Reforms for Metropolitan Areas

1. Institute the Metropolitan Planning Committee (MPC)
2. All metropolitan areas (UAs) with population above 4 million, should set up an UMTA to facilitate integration of multi-modal transport systems and ensure it works with the MPC and has the MDA as the secretariat

State Level Reforms

1. Create and establish the Municipal Cadre
2. Set up a Municipal Regulator at the State/city level to
 - advise and monitor the service delivery levels;
 - regulate the pricing of services; and
 - ensure equitable access to all urban citizens, including urban poor.
3. Revise town planning act, development control regulations, municipal laws and building bye-laws with a view to promote strategic densification, single window clearance process, to promote conservation of environment and so on
4. Simplification of legal and procedural frameworks for conversion of agricultural land for non-agricultural purposes within a time bound period
5. Repeal of Urban land Ceiling and Regulation Act
6. Amendment of Rent Control Laws
7. Rationalisation of Stamp Duty to bring it down to 5 per cent or lower
8. Introduction of computerised process of registration of land and property
9. Provide security of tenure at affordable prices to urban poor
10. To facilitate public–private partnerships, and market borrowing (through provisions in the Municipal Act)
11. Transfer 18 functions to ULB as per 74th CAA
12. Strengthen the State Finance Commissions and act on the existing recommendations of previous SFCs
13. Set up a State Property Tax Board
14. Extending the term of Mayor to five years and adopt a Mayor-in-Council or Executive Mayor system
15. Enactment of community participation law
16. Enactment of Public Disclosure Law

17. State-level reforms pertaining to water and sanitation sector which includes:
- Prepare a regional water supply, sanitation and solid waste management plan. (to have larger aggregation, development of watershed and economies of scale)
 - Transfer the water supply function (distribution within the city) fully to the cities
 - Introduce policies to augment bulk water and resource allocation plans in alignment with the basic requirements of the city
 - Follow the three 'Rs'—*Reuse, Reduce, Recycle* policy for waste management based on the quantum generated
 - Provide incentives for waste water recycling policy incentives.
 - Increase resource provision for augmentation of sewage system/toilets for weaker sections
 - Prepare implementable PPP policy for cities
 - Formulate ground-water use by laws and enforce effectively energy conservation measures especially in pumping

Incentive Reforms and Conditionalities

- Create and establish the Municipal Cadre
- Set up a Municipal Regulator at the State/city level
- Extending the term of Mayor to 5 years and adopt a Mayor-in-Council or Executive Mayor system
- Revise Town Planning Act and so on
- Simplification of legal and procedural frameworks for conversion of agricultural land for non-agricultural purposes
- Amendment of Rent Control Laws
- Provide Security of Tenure at affordable prices to urban poor
- Amend Municipal Laws to include Fiscal Responsibility and Budget Management principles for ULBs
- Release the land under ULCRA for development of affordable housing
- Introduction of Property Title Certification System in ULBs
- Transfer 18 functions to ULB as per 74th CAA
- Any substantial innovation in the area of urban governance or financing
- Take up projects under PPP
- Leverage fund through non-budgetary resources

Incentive Reforms for Metropolitan areas

- Adoption of an agency model, for example, BEST model of service
- Exceptional performance in the area of service delivery, collection of user charges and property tax.

Addressing Operational and Organisational Issues through JNNURM-II

18.156. The need to adopt a unified approach to achieve planned, inclusive and sustainable urban development has long been recognised. Hence one of the objectives of JNNURM-II which has been envisaged as the umbrella programme should be to facilitate convergence of the initiatives at central and State-level for guided urbanisation.

18.157. To this end, at the central level it is proposed that the reform agenda for the Urban Infrastructure and Governance (UIG) sub-mission and Ray Awas Yojana (RAY) and the programme on slum rehabilitation for others cities outside of RAY is strengthened. Similarly to effectively assist States with reform management and implementation, and

capacity building initiatives it is proposed that a separate sub-mission, that is, Capacity Building and Reform Management (CBRM) is launched under JNNURM-II. This approach would facilitate convergence across the two ministries at the centre, and enable the Central Government to collectively provide State and city Governments with adequate support to implement reforms and projects. In addition, it would also systematically monitor the progress on reform implementation across States and assist them with strategic capacity-building initiatives, for example, revitalising existing institutions, setting up a municipal cadre and so on.

18.158. To facilitate convergence at the State-level, a single State-level nodal agency (SLNA) should be set up for implementing all centrally sponsored

urban programmes in the State. This agency would have project management and implementation units for UIG, RAY, National Urban Livelihoods Mission (NULM), other housing programmes and capacity building, and the would be led by either the Secretary Urban Development or Housing depending on their seniority.

18.159. The SLNA could be the nodal contact for all participating ULBs. It would also help strengthen the District Urban Development Authorities to assist smaller cities with project development and finance and reform implementation. In addition, it would technically appraise projects submitted by ULBs, and forward them onto the competent authority for sanction, transfer money to ULBs as per the project implementation phase and provide ULBs with the requisite technical support, and enable pooled finance development through the setting up of State-level financial intermediaries, in order to provide financial assistance to smaller ULBs.

Providing Operational Flexibility

18.160. In keeping with the recommendations of the Second Administrative Reforms Commission, JNNURM-II should encourage agencification to provide operational flexibility, essential for the missions to discharge their duties effectively.

18.161. In line with this, all the four sub-missions envisaged under JNNURM-II could be set up as agencies, that is, organisation with a board, and the board could be chaired by the Secretary of the respective ministries at the central level. Other board members could include senior representatives from the Department of Expenditure, Urban Transport, Mission Director—RAY, Planning Commission, Mission Director—Capacity Building and Mission Director of the programme for slum rehabilitation in smaller cities. In addition, to further the spirit of participatory governance, a few eminent individuals should also be co-opted as board members. The board of the sub-mission, CBRM could be chaired by eminent individual as it seeks to facilitate convergence across the two ministries.

18.162. It is important to note that all decisions with regard to capacity building should ultimately be approved by the CBRM board after gathering muster with the Council on Capacity Building, that is, a three-member council chaired by the Additional Secretary heading this unit with Mission Director, JNNURM-I and Mission Director—RAY as members. Similarly, the SLNA should also be set up as an agency whose board should be chaired by the nominee of the Chief Secretary of the State and include senior representatives from the State Government's department on finance, housing, parastatals, for example, housing Boards, transport and local self-government, depending on the governance structure of the State. In addition it should have also co-opt a few eminent civil society representatives.

Preparing for JNNURM-II

18.163. Significant preparatory work is required to be undertaken by the centre and States in the areas of planning, capacity building and preparation of model legislations, and policies. During the initial two years of JNNURM-II the following should be accomplished:

- The projects sanctioned under JNNURM-I and pending reforms should be completed
- The implementing ministries through CSMC may sanction projects based on the allocation provided for basic services
- The Centre, State and the ULBs should undertake extensive capacity building programme and formulate State-level strategies for a 10-year horizon
- Municipal cadres should be established and professionalised in States in which they have been established. This would include clear guidelines on roles, career progression, and recruitment rules to ensure these cadres fructify into high quality capacity on the ground.
- DP and FP should be prepared based on the guidelines proposed by the MOUD

Fund Flow Mechanism

18.164. The cities receiving assistance under the programme would be selected as per the mechanism designed for the programme.

- Once the DP and the FP are approved, the annual allocation of the city are recommended to be released in two instalments by the Ministry of Finance, that is, in April and October of the year. The release should be made to the ULBs by Ministry of Finance through the State Government.
- In the second year, the Mission Directorate should examine the financial and reform related parameters made in the DP, FP and RFD. In the initial year of Plans, while releasing funds, progress in approved project would be taken into account. As projects would start maturing, by the Thirteenth Plan the release should be linked to the outcome of the projects in terms of service delivery. As long as these parameters are met, the annual allocation for the second year should be released in two instalments. In the subsequent years, the Mission Directorate will follow the same procedure for release of funds.
- Under this arrangement, JNNURM funds should be fungible across various approved projects in a city.
- The fund flow mechanism of Rajiv Awas Yojana should continue to be governed by the current approved mechanism and may be reviewed at the time of review of RAY.

Leveraging Funds under JNNURM-II

18.165. As brought out by the HPEC Report and the Report of the Working Group on Financing Urbanisation, there is a huge gap between the funds required for successful urbanisation and the funds available with ULBs. In view of the severe budgetary constraint, this gap can only be partly filled by contribution from the Centre and States. Therefore, the ULBs must leverage such contributions from the Centre and States to attract private investment besides generating their own revenues through comprehensive reforms. One of the key focus areas of the scheme would be to leverage central assistance under JNNURM so that investment in urban sector is augmented.

Share of the State Government

18.166. JNNURM-II would incentivise the State Governments for financial devolution to ULBs for improving their financial sustainability. Till this is

done, the State should contribute 50 per cent of the amount of grant provided to a ULB by the Centre under JNNURM-II or the amount recommended by the State Finance Commission, whichever is higher.

Incentive Fund

18.167. For incentivising completion of second generation urban reforms 10 per cent of JNNURM funds would be earmarked as Incentive Funds. These funds are envisaged to be disbursed to States and metropolitan cities once the CRBM certifies that the reforms have been implemented in letter and spirit (refer to Box 18.12).

MISCELLANEOUS SCHEMES

18.168. In accordance with the recommendations of the Chaturvedi Committee, a guiding principle in the Twelfth pan is to run umbrella schemes having different components. In the preceding sections, major scheme for urban renewal for the Twelfth Plan period have been described. In addition, following schemes/projects would also continue in the Twelfth Plan period.

General Pool Accommodation (Residential and Non-residential)

18.169. This scheme provides for office and residential accommodation for Central Government

Box 18.12

Major Schemes for Urban Renewal at a Glance

State sector ACA scheme: Jawaharlal Nehru National Urban Renewal Mission (JNNURM) having following components:

- Urban Infrastructure and Governance (UIG)
- Rajiv Awas Yojana (RAY)
- Slum rehabilitation in cities not covered under RAY
- Capacity building

Centrally Sponsored Schemes

National Urban Livelihood Mission having two additional components:

- Scheme for support to street vendors
- Scheme for assistance to the States for provision of shelters.

1) National Mission on sustainable Habitat

departments and employees through CPWD. As land parcels available with the Ministry are mostly in prime locations they have significant potential to generate resources, embarking on PPPs towards this end would be an effective route to pursue, given the thrust of the Twelfth Plan on such arrangements.

North Eastern Region Urban Development Programme (NERUDP)

18.170. Launched with the assistance of the Asian Development Bank (ADB) to encourage development in the North Eastern Region as well as increase support through multilateral agencies, the programme provides support for priority urban services viz. (i) Water Supply, (ii) Sewerage and Sanitation and (iii) Solid Waste Management in the capital cities of five North-Eastern States viz. Agartala (Tripura), Aizawl (Mizoram), Gangtok (Sikkim), Kohima (Nagaland) and Shillong (Meghalaya). Under the Twelfth Plan, this programme would be recast and taken under the overall framework of JNNURM.

National Capital Region Planning Board

18.171. The NCR Planning Board is providing financial assistance to create civic amenities in the National Capital Region (NCR). The assistance is in the form of soft long-term loans to the participating State Governments and other parastatals for infrastructure development projects in the constituent NCR States and identified Counter Magnet Area (CMA) towns. The activities of the NCRPB would be expanded in the Twelfth Plan period.

Other Schemes/Projects

Ministry of Urban Development

Urban Transport Planning and Capacity Building in Urban Sector

18.172. The scheme provides assistance upto 80 per cent of cost of city specific comprehensive traffic and transportation studies and builds capability to undertake comprehensive urban transport planning. The scheme should be subsumed under the renewed JNNURM in the Twelfth Plan period.

Research and Capacity Building in Urban and Regional Planning

18.173. The scheme was launched to build capacity building for urban regional planning at the ULB level. While capacity building for regional planning is a prerequisite for sound urban development, the scheme should be subsumed under the renewed JNNURM.

Capacity Building Scheme for Urban Local Bodies

18.174. A scheme for capacity building for ULBs was initiated for supporting implementation of various reforms. This was supported by the creation of nine Centres of Excellence in reputed institutes like IIT Chennai, IIT Guwahati, IIM Bangalore, ASCI Hyderabad, Centre for Science and Environment, Lal Bahadur Shastri National Academy of Administration, Mussoorie and so on. Under the Twelfth Plan, the scheme should be subsumed under the Capacity Building sub-component of JNNURM.

National Mission Mode Project for E-Governance in Municipalities

18.175. This scheme was launched under the UIG component of JNNURM for providing 'single window' services to the citizens. Since e-governance is not only a reform in itself, it is an enabler for other reforms, a major emphasis has been recommended under the improved JNNURM. Hence, the scheme would be subsumed under the capacity building sub-mission of JNNURM under the Twelfth Plan.

Scheme for Urban Infrastructure Development in Satellite Towns/Counter Magnets of Million Plus Cities

18.176. Under the renewed JNNURM, special emphasis has been laid on development of satellite towns, especially by developing their transport and communication linkages with the mega city. Hence the scheme would be subsumed under the JNNURM.

Pooled Finance Development Fund

18.177. The Pooled Finance Development Fund was approved in 2006 to help ULBs to raise funds from capital markets for urban infrastructure projects. An amount of ₹2,500 crore was provided for the

Eleventh Plan. However, the scheme could not pick up during the Eleventh Plan period. Since raising finances at municipal level is one of the main thrust under JNNURM, for which several interconnected recommendations have been made to boost investors' confidence, the scheme would be subsumed under the new JNNURM.

Ministry of Housing and Urban Poverty Alleviation

Interest Subsidy Scheme for Housing the Urban Poor (ISSHUP)

18.178. The scheme was launched to provide interest subsidy of 5 per cent per annum for housing purpose for lending to the EWS and LIG segments of urban areas. Since slum rehabilitation requires a holistic approach the scheme has been subsumed under the Rajiv Awas Yojana.

Grant to Building Material and Technology Promotion Council (BMPTC)

18.179. Under the Eleventh Plan, grant has been provided to the BMPTC to meet multiple objectives of promoting innovation in building material, mainstreaming disaster management and to work as a resource centre for capacity building and skill development. As these objectives are critical to success of any housing related scheme, there is a need for their continuation as well as convergence with the other programmes being implemented by the Government in housing sector. Encouragement to the innovative practices should be funded under the overall umbrella scheme of the Rajiv Awas Yojana rather than taking up these activities on stand alone basis. Hence, the assistance to BMPTC should be done under the capacity building component of the Rajiv Awas Yojana.

Urban Statistics for HR and Assessment (USHA) Scheme

18.180. The scheme has been launched to develop and maintain a data base, MIS and knowledge repository relating to urban poverty, slums housing, construction and other urbanisation related statistics. Creation of a Municipal level MIS system has been recommended under the new JNNURM. Hence the

scheme should be subsumed under the renewed JNNURM.

Externally Aided Capacity Building Schemes

MOUD

1. Capacity building for urban development (JNNURM)—assistance from the World Bank:
2. Capacity building for Urban Transport—Assistance from the World Bank

MOHUPA

1. World Bank Capacity Building Project for urban development
2. Technical assistance from DFID for support to National Policies for urban poor

18.181. It is recommended that all Capacity Building activities should be taken under the overall framework of JNNURM.

EXPECTED OUTCOMES IN IMPROVEMENT IN SERVICE DELIVERY

18.182. The urban sector is predominantly a State subject. The nature of engagement by the Central Government would be to primarily incentivise urban reforms and assist the States/ULBs in improving the delivery of urban services at affordable costs. Such measures would not only improve the financial health of ULBs, but also dismantle structural barriers and in turn make cities more inclusive. These would constitute broad outcomes of the schemes under the Twelfth Plan period.

18.183. As regard specific outcomes in terms of improvement in service delivery, the Ministry of Urban Development has developed detailed service level benchmarks for a number of urban services. Such benchmarks include 24 × 7 water supply, water consumption norms of 135 lpcd for all cities, 100 per cent individual piped water supply, 100 per cent collection and treatment of solid and liquid waste, underground sewerage system for all cities. Similarly, benchmarks have also been developed for storm water drainage, urban transport, urban roads, traffic support infrastructure, urban transport and

street lighting. As observed by the Isher Ahluwalia Committee, these benchmark norms are consistent with the economic and social aspirations arising from India's GDP growth target of 8 to 9 per cent per annum. Since different States and cities are at different stage of development, it will be essential for the Central Government to undertake an audit during the preparatory phase of JNNURM-II to determine the service levels across States and set outcome-based targets for services admissible under JNNURM-II for individual states. In the longer term, all state and cities should aspire to achieve the aforesaid service-level norms.

OVERALL BUDGETARY OUTLAYS FOR URBAN SECTOR

18.184. An indicative outlay of ₹1,20,557 crore for Ministry of Urban Development (MoUD) and ₹43,521 crore for Ministry of Housing and Urban Poverty Alleviation (MoHUPA) has been made. This includes provision of ₹1,01,917 crore for the Flagship Scheme of JNNURM which is a State sector ACA scheme and is implemented jointly by both the aforesaid Ministries. The share of MoUD in JNNURM is ₹66,246 crore and of MoHUPA is ₹35,671 crore.

Other Priority Sectors

CONSTRUCTION SECTOR

BACKGROUND

19.1. Construction activity creates physical assets in a number of sectors of the economy. Construction sector has two key segments: (i) Buildings, falling into one of the following categories: residential, commercial, institutional and industrial; and (ii) Infrastructure such as road, rail, dams, canals, airports, power systems, telecommunication systems, urban infrastructure including water supply, sewerage, and drainage and rural infrastructure. Assets once created also need to be maintained. Many upstream economic activities depend upon the construction sector. It is roughly estimated that 40–45 per cent of steel; 85 per cent of paint; 65–70 per cent of glass and significant portions of the output from automotive, mining and excavation equipment industries are used in the construction industry.

19.2. Construction accounts for nearly 60–80 per cent of the of project cost of roads and housing and a significant portion in case of other infrastructure sectors. Construction materials such as cement and steel, bricks and tiles, sands and aggregates, fixtures

and fittings, paints and chemicals, petrol and other petro-products, timber, minerals, aluminium, glass and plastics account for nearly two-third of the construction costs. The forward and backward multiplier impact of the construction industry is significant.

CONSTRUCTION SECTOR AND THE INDIAN ECONOMY

19.3. The Construction sector has been contributing around 8 per cent to the nation's GDP (at constant prices) in the last five years (2006–07 to 2010–11). As indicated by Table 19.1, GDP from Construction at factor cost (at constant prices) increased to ₹3.85 lakh crore (7.9 per cent of the total GDP) in 2010–11 from ₹2.85 lakh crore (8 per cent of the total GDP) in 2006–07. The growth in construction sector in GDP has primarily been on account of increased spending on physical infrastructure in the last few years through programmes such as National Highway Development (NHDP) and PMGSY/Bharat Nirman.

EMPLOYMENT IN THE CONSTRUCTION INDUSTRY

19.4. With around 31,000 enterprises involved in the construction industry in 2011, the industry is the

TABLE 19.1
Construction Sector-Macro Aggregates

Macro-variable	2006–07	2007–08	2008–09	2009–10	2010–11
GDP from Construction (lakh crore)	2.85	3.15	3.33	3.56	3.85
Share of GDP (%)	8.0	8.1	8.0	7.9	7.9
Growth rate for GDP in Construction (%)	10.3	10.7	5.4	7.0	8.1

Source: Handbook of Statistics, RBI 2010–11.

second largest employer in the country after agriculture. Over 95 per cent of the enterprises numbering around 29,600 employ less than 200 persons; over 3 per cent or around 1,050 enterprises employ between 200 and 500 persons and only a little over 1 per cent or 350 enterprises have more than 500 employees. The employment figures have shown a steady rise from 14.5 million in 1995, 31.5 million in 2005 to 41 million in 2011. Between 1995 and 2005, there was a substantial drop in the proportion of skilled engineers in the workforce from 4.71 per cent to 2.65 per cent. This trend seems to have been arrested if not reversed with the number of engineers in 2011 at 2.56 per cent, that is, 1.05 million. The number of technicians and foremen is 1.12 million which represents 2.74 per cent of the workforce which shows an improvement over the 2005 when their proportion was 1.85 per cent. The number of skilled workers at 3.73 million constitutes 9.1 per cent of the total workforce which is marginally lower than their proportion of 10.57 per cent in 2005. Apart from clerical staff of 0.93 million, that is, 2.26 per cent, the rest of the workforce of 41 million in 2011 is comprised of unskilled workers whose number stood at 34.2 million representing 83.3 per cent which is almost at par with the proportion of 82.45 per cent in 2005. A large part of the industry remains unorganised which negatively impacts on the quality of delivery. Amongst the workforce, there is predominance of migrant labour which increases their vulnerabilities. There is a need to go in for state-centric surveys to capture the flow and pattern of migration rather than depending upon macro level data.

DEVELOPMENTS DURING THE TENTH AND ELEVENTH PLANS

19.5. Some notable achievements during the previous plan periods have been:

- Construction Sector was declared as an industrial concern under the IDBI Act in March 2000 in order to increase the flow of institutional credit to the sector.
- Implementation of national Human Resource Development (HRD) initiatives in the non-formal sector, including the workers' level to the upper levels of engineering and managerial categories
- Setting up of the Arbitral Institutions for resolution of business disputes in construction industry
- Setting up of disaster identification and mitigation centres which helped in development of a cadre of professionals well-trained to take disaster mitigation activities
- Development of institutions and implementation plans for safety and quality related issues
- Obtaining state-of-the-art global technology through strategic association between industry, government and international bodies
- Effective dissemination of information, regarding good work practices, and development of an action frame work for quality and safety audits, assessment and certification as well as training of man-power both for practice and research
- Improvement in procurement practices for the public sector, and also development of regulatory manuals to ensure quick and effective procurement procedures
- Electronic tendering process, online publishing of tender notices and related procedures are becoming more and more common.
- Setting up of models of public-private partnership in construction activity
- Development of consultancy and advisory services in the areas of project and construction management, procurement services, regulatory issues, and technology. Institutional Arbitration has taken firm root with the operationalisation of Construction Industry Arbitration Council. Nineteen cases have been undertaken so far.
- Specialised institution (Construction Industry Vocational Training Council) was set up at the national level to provide training to vocational and supervisory trades of the construction industry.
- Safety record of the industry has shown improvement. The accident frequency rate in 2011 declined to 0.006 accidents per million man-hours worked from 0.009 in 2007. This is due to professionalisation of big contractors.
- On account of better training opportunities and enhanced mechanisation, productivity per person

in the industry has increased from ₹78,440 in 2007 to ₹98,620 in 2011.

- A national level comprehensive Green Rating Initiative has been made ready and is ready to be launched.
- National level awards (Vishwakarma Awards) instituted by Construction Industry Development Council (CIDC) for outstanding performance have received good response. The awards cover all levels from artisans to life-time achievement awards for industry captains. Awards are also given for projects, with categories including Safety, Health, Environment, Special Features and so on.
- Construction cost indices, sponsored by MOSPI have received good response from project owners.

CONSTRAINTS IN THE CONSTRUCTION INDUSTRY

19.6. Despite the achievements during the previous plans, construction industry faces many constraints. Although 41 million people are employed in this sector, less than 6 per cent has the benefit of structured training and skill building. Skill upgradation schemes launched by the state and Central Governments are not adequate and only a handful of large firms organise training programmes. Construction firms are regulated under multiple laws and there is no unified regulatory framework. There is lack of efficient and stable regime for dispute resolution in contracts leading to costly and time-consuming disputes between the promoters of the project and contractors. Although the flow of bank credit has improved to the construction industry, institutional finance still remains inadequate. High cost of finance translates into high costs for the industry and the economy. Presently construction industry suffers from poor state of technology leading to inefficiencies, wastage and low value added. Investment in R&D is 0.03–0.05 per cent of the investment in construction as against 1.5–2 per cent in South East Asian countries and 4–6 per cent in developed economies. These and other constraints require to be redressed during the Twelfth Plan period.

STRATEGIES FOR THE TWELFTH PLAN PERIOD

Key drivers of growth of construction industry

19.7. Forecasts for the market size of construction industry for the Twelfth Plan period indicate that the aggregate output of the industry during the period 2012–13 to 2016–2017 is likely to be 52.31 lakh crores increasing from 7.67 lakh crores in 2012–13 to 13.59 lakh crores in 2016–17. As noted earlier, growth in construction industry is linked to the growth in the infrastructure sector and the building industry. The output of the industry is likely to be contributed almost equally by the buildings and infrastructure segments respectively. The thrust on capacity expansion in the infrastructure sector will continue in the Twelfth Plan. Apart from steady growth in construction related to industrial buildings, the industry catering to commercial real estate in the non-residential sector is likely to grow at an accelerated pace due to a vibrant and growing service industry such as IT and related sectors, hospitality and tourism industry and logistics services. The real estate sector faces challenges despite strong growth in the past. The current trend in real estate market is that after making investments in land, the project construction is mainly retail financed, that is, through advances or milestone based payments from owners. In affordable housing projects retail financing would be a challenge as the ability of the retail investors would be very limited. This issue becomes more significant in the category of affordable housing for low income group and economically and weaker segments of the society.

HUMAN RESOURCE STRATEGIES FOR THE TWELFTH PLAN

19.8. Construction industry faces acute shortage of skilled workers especially in mechanised trades. Even in the case of engineers, there is reduction of share of new trainees in Construction Engineering Streams (Civil, Electrical, and Mechanical Engineering). This is due to reduced intake by colleges following the lack of placement opportunities for civil engineers. The trend has started reversing but needs stepping up considerably. On account of natural attrition and the need of skills of contemporary trades, Construction Industry needs infusion of at least 6 million persons

per year. The total training capacity is woefully inadequate. Against a requirement of over 3.5 million trained tested and certified workers, the capacity available is about 0.5 million per annum. The ITIs, both in private and public sector are not able to offer many trades relevant to construction Industry. Schemes such as NREGS have further reduced the state of fresh entrants since the unskilled or semi-skilled workforce is no more desirous of migrating as they are able to source employment locally. Skill upgradation schemes launched by the Governments both at State and Central Government level are inadequate and industry sponsored apprenticeship is not easily available. Only a handful of large firms organise training programmes. NSKDF (National Skill Development Fund) schemes are not attractive since the funds are provided to training providers as loan which have to be recovered from recipients who are generally too poor to be able to pay for training. Apart from shortage of workers, the industry is facing shortage of contractors, especially in specialised areas. Most of the construction materials continue to be manufactured in the informal sector which makes it difficult to induct modern technology.

19.9. Construction Industry Development Council (CIDC)—an industry association formed with the initiative of the Planning Commission—is actively involved in imparting training and skill up-gradation of the workers in the industry. It has taken steps in association with a few states such as Madhya Pradesh, Rajasthan, Bihar and Haryana for training and certification of construction workers. These states have made available the physical infrastructure of the ITIs situated in their States, where training in self-financing mode is being conducted by CIDC and skill certification is given by CIDC. This scheme needs to be extended to other states after auditing the scheme and removing any deficiencies. Ministry of Labour and DG (ET), NCVT (National Council of Vocational Training), have taken measures to launch skill certification initiatives through CIDC and also under MES/SDI schemes. Resources from the SDI (Skill Development Initiative) Scheme can be used for training the workers in construction industry. Some firms in the construction industry such as L&T

have undertaken their captive training programmes. More firms should be encouraged to do so. These efforts need to be up-scaled and accelerated. One source of funds for doing this can come from The Building and other Construction Workers Welfare Cess Act, 1996 which aims to garner resources, through a cess but does not lay down specific norms for expenditure of the sums, thus collected. It is proposed that a portion of this fund could be utilised to meet the financing requirements of workers training through a nominated and authorised nodal agency. A dedicated fund for human resource development in the construction industry could be set up for taking these ideas forward. This fund known as Construction Skill Development Fund (CSDF) could be set up with ₹200 crores per year from above source and a matching amount from the industry to facilitate training of at least 2,00,000 workers per year.

19.10. The next major issue needing attention is continuous skill upgradation and reversing the attrition of engineers from the Construction Industry. Engineering Council of India, the apex body, having representation of several engineering professional organisations has made several proposals to the Government of India, in this context, which may be studied and acted upon. It is proposed that an Engineers Bill be enacted to look into issues of professional development of practicing engineers and Industry be encouraged through some tax incentives, which could be availed for HRD initiatives launched by them. Curriculum for Construction should be developed and harmonised. Steps must be taken to establish Department of Construction Engineering in Colleges and Universities. As per a CIDC survey, nearly 85 per cent of engineering graduates are unemployable on graduation. This position can be improved by internship after or during graduation. A pilot project undertaken by CIDC with an Engineering University saw employability going up significantly. A continuing programme for industry orientation and experience for teachers is essential for improving employability further. Workshops are needed at every state capital in collaboration with engineering institutions to evolve a mechanism to improve the engineering curricula and also introduce

apprenticeship. A structured interface is required between the industry bodies and the Ministry of HRD, UGC and AICTE on these issues.

SAFETY AND RELATED ISSUES OF CONSTRUCTION WORKERS

19.11. Apart from training, welfare for workers should be a major area of action during the Twelfth Plan. Workers in the construction industry are vulnerable to inherent risks to their life and limbs. Temporary relationships between employer and employee, uncertain working hours, lack of basic amenities and inadequacy of welfare facilities are some of the difficulties faced by the employees. The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 was enacted recognising the need for a comprehensive Central legislation for regulating the safety, health, welfare, and other conditions of service for construction workers. However, only a few states have implemented the provisions of the Act, such as setting up welfare boards. Twelfth Plan will aim at accelerating this process of implementation of the provisions of the Act. As a substantial segment of the construction industry workforce, women workers need to be accorded special focus in both skill training as well as stipulated social benefits.

19.12. A major issue concerns with the Provident Fund for Construction Workers. It has been pointed out by the industry representatives that although large sums of monies are being deposited with the PF Trust every year, use and withdrawal of these monies by the beneficiaries, is near absent. Proceeds of this deposit are estimated at about ₹25,000 crores by industry bodies but would require official authentication. Such unutilised funds need to be distributed amongst the beneficiaries and used for the welfare of the workers. Industry representatives have suggested that a sub-trust for construction industry should be created. Another source of funds is The Building and other Construction Workers Welfare Cess Act, 1996 through which since 1996, a cess amounting to 2 per cent of the contract value being executed by any contractor is being deducted as the mandatory workers welfare cess. It is believed by industry bodies that sums with various State Governments now aggregate

to ₹22,500 crores and are reportedly lying unutilised. These funds could be used for skill upgradation and improving the living conditions of the workers.

REGULATORY FRAMEWORK IN THE CONSTRUCTION INDUSTRY

19.13. Construction has been declared as an industry but has presently no regulatory framework on an all India basis. For example, although the National Building Code and Common General Conditions of Contract have been evolved, they have not been mandated as applicable either by the Central Government or any of the states. Presently no common construction law exists and the construction activities are administered through 32 different laws, rules and statutes. For example, there are 27 different statutes dealing with labour alone, starting with the Children (Pledging of Labour) Act, 1938 to the Employees Provident Fund and going to the Miscellaneous Provisions (Amendment) Act, 1996. To deal with the multiplicity of laws, it has been suggested by the construction industry to have a Common Construction Law which would harmonise the existing statutes related to construction sector. It has also been suggested that a nodal regulatory authority in the shape of Central Construction Authority at the national level and State Authorities at the state levels should be formed to administer and monitor the Construction Law. The proposed authority could act as a nodal agency of the Government on all issues related to the construction sector. It has also been suggested that the related statutes of Japan and Singapore could be studied for adoption in India. These suggestions would need to be discussed widely and debated before a firm view could be taken on them. This exercise would be taken up during the Twelfth Plan period.

19.14. Apart from the actions to be taken by the Government, the Industry itself should adhere to the principles of self-regulation with the help of industry associations such as Builders Association of India, CREDAI, CFI and others. The focus of self-regulation should be labour welfare measures, adherence to environment norms, ethical work practices, joint apprenticeship programmes.

CONTRACTING SYSTEMS AND DISPUTE RESOLUTION

19.15. There are shortcomings in the present contracting procedures as pointed out by various industry bodies. The procedures are costly and cumbersome for both the project owners as well as the contractors. It has been estimated that the total cost of procuring, supervising and monitoring incurred by the project owner comes to about 22 per cent of the cost of asset created. Lack of standardisation of contract procedures and evaluation criteria is another difficulty associated with contracting process. Whereas the special conditions could vary, core conditions could be standardised to avoid subjective interpretation of clauses leading to disputes. In this connection, it would be useful to study the Uniform Contract Conditions and a model bidding document for domestic contracts finalised by the Ministry of Statistics and Programme Implementation, Government of India and promote a wider adoption of the same. There is also a prevailing view that the contract conditions are not equitable. Elements such as performance guarantees and other requirements lead to an increase in the cost of the project. Time and cost over-runs are often caused by ambiguities in conditions governing damages to contractors due to delays by project owners, resource mobilisation through advances and cost escalations. In case of PPP contracts for the road sector, Planning Commission has come out with standardised model concession agreements which have facilitated the implementation of these projects.

19.16. It has been suggested that the criteria of awarding works to the lowest cost bidder adopted by the procuring agencies in the public sector hinders in the process of adoption of better technology, best practices and quality. It might result in cost cutting practices by contractors and preventing passing on the benefits to the workers. In this respect, it has been suggested that 'Effective Lowest Price' rather than the 'Lowest Price' as adopted by the Ministry of National Development, Government of Singapore may be considered for adoption. Technology capacity of contractors should be made part of contract requirement for different categories of projects—based on their value and it should also

be part of pre-qualification process. Efforts could be made to include contractors' proposals as part of contract conditions. Availability of some minimum percentage of skilled and certified manpower with Contractors should be made part of contract requirement for different categories of projects based on value. Incentive for better efficiency should be made part of the contract requirements. A system of incentives for timely completion and better performance needs to be integrated in procurement procedures by all public agencies. Instead of pre-qualifying the agencies time and again, departments desirous of engaging the contractors can resort to choosing contractors on the basis of their grading, followed by a periodical surveillance. Intensification and universalisation of the e-tendering system is also required to be undertaken.

ARBITRATION AND DISPUTE RESOLUTION

19.17. The enactment of Arbitration and Conciliation Act 1996 provided for an effective framework for resolution of disputes without depending on the overburdened judicial system of the country. Despite these improvements, the arbitration process continues to be predominantly ad-hoc leading to a situation where according to a CIDC survey, ₹1,35,000 crores remains blocked in the construction sector over disputes. There is an increasing tendency to appeal on grounds of 'misconduct' on the part of arbitrators particularly taking the view that they are not being approved by any responsible organisation. There is no provision for a neutral body to administer and supervise arbitration. Besides, there is no quality control of arbitrator's qualifications and expertise, no assistance is available in managing arbitrator's fees and there is lack of close supervision of arbitrator's progress. A solution to the above problems is to use the Institutional Arbitration system according to which appointment of arbitrators is done from international, national or regional panels. Other features of this system are: having a code of ethics which binds the arbitrators and a pre-determined level of fees. This system is hoped to improve the quality of arbitrators, manage arbitral fees and maintain close supervision and monitoring of arbitrator's progress. During the Twelfth Plan, steps would be taken to operationalise these recommendations.

ENVIRONMENT AND ENERGY

19.18. Construction sector is one of the highest consumers of natural resources and energy amongst the various industries. The industry needs to give particular attention to the following aspects: management of water resources and amelioration of water pollution; efficient use of materials and energy and environmental management during implementation phase and post completion phase. All construction projects undertake mandatory Environment Impact Assessment as per the guidelines of Ministry of Environment and Forest and the concerned State Governments. It is now being increasingly realised in the construction industry that sustainable development concepts, applied to the design, construction and operation of buildings, can enhance both the economic well-being and environmental health of communities. If sustainable design principles are incorporated into building projects, benefits include resource and energy efficiency, healthy buildings and materials, ecologically and socially sensitive land use, transportation efficiency, and strengthened local economics and communities. Under National Bankers Mission, for example, the Government is funding establishment of bamboo mat-making centres and giving training to local women workers in bamboo growing areas of the North-eastern States of India. These centres will supply the bamboo mats for further processing at industrial units for production of bamboo mat corrugated sheets for roofing of buildings. With a view to promote green building materials, the Government of India in their successive budgets after 1993 have been providing excise duty concessions on the materials manufactured from recycling of agro-industrial wastes and by-products. It has also set up an interdisciplinary organisation. Building Materials and Technology Promotion Council was set up in the Urban Development Ministry to address the issues of environment friendly and energy efficient building materials and technologies.

19.19. Construction Industry needs to work in unison with Bureau of Energy Efficiency to develop Green Building Guidelines based on energy efficiency and use of renewable energy; direct and indirect environmental impact; resource conservation and

recycling; minimisation of waste; water-harvesting; indoor environmental quality and community and site related issues. Construction industry should develop typical green building guidelines for different geo-climatic regions. Energy Consumption Indices should be developed for different types of building occupancies, site conditions, and climatic zones. Governments at Central, State and Local levels should also encourage use of green construction. CIDC is now taking an initiative along with a few states to facilitate development of technologies and building guidelines and promoting practice of green construction. CIDC is also interacting with international agencies which have expertise in concepts and technologies relating to green building materials and construction systems. CIDC is collaborating with Building Construction Authority of Singapore to evolve a Green Mark for Buildings. This aims at assessing buildings in five key areas of environment energy efficiency, water efficiency, site development and building management, indoor environmental quality and environmental innovations. Green Marking will provide a meaningful differentiation of buildings in the real estate market. The Government may also consider giving fiscal incentives for use of building materials produced from recycling of wastes and by-products from agricultural, forestry and industrial operations. Concrete steps will be taken during the Twelfth Plan period to promote the concept of green building.

TECHNOLOGY AND PRODUCTIVITY

19.20. Bulk of the construction industry suffers from poor state of technology. Inefficiency, wastage and low value added arise at two fronts: first, due to low technology used in the manufacturing of construction material and second due to low technology used during construction itself. It is important that productivity enhancement of construction industry is driven both by a demand for high quality as well as supply for the same. In order to reduce cost of works in rural roads sector, it is important to develop and use 'marginal materials' instead of traditional costly materials. As part of technology up gradation, there is need to enhance the use of IT and IT-based solutions for the construction industry. It is proposed that a

National Construction Research and Development Fund be created with a grant from the Government and matching contribution from the industry.

19.21. The productivity of the industry has shown a positive trend in recent years as seen from Table 19.3 earlier on account of better training and higher mechanisation. However, compared to other countries, for example, China, US, Europe, on an average, it is 35–45 per cent lower after factoring in purchase power parity. With rapid advances in technology and much better training especially at the lower and middle levels, productivity is expected to rise substantially.

QUALITY AND STANDARDS

19.22. Quality of construction has been recognised by the industry as a weakness. In recent years, some companies by actively supporting training and certification of workers, supervisors and managers have tried to improve on the quality dimension. The skill upgradation programme by CIDC is also a sustained effort in that direction. Use of technology like Ready Mixed Concrete and pre-fab techniques along with more intensive use of information technology has also helped. Many construction companies are working to obtain ISO 9000 series certification. Bureau of Indian Standards has started formulating performance standards which will gradually supercede prescriptive standards. There are two good global examples for quality certification in the construction sector from Singapore and UK respectively. Singapore has introduced a scheme called The Construction Quality Assessment System or CONQUAS which was developed by the Building and Construction Authority (BCA) in co-operation with major public sector agencies and various leading industry professional bodies to measure workmanship quality in a completed building. Since the launch of CONQUAS in 1989, more than 1,500 public and private building projects have been assessed by BCA. The contract value of these projects exceeded US\$50 billion. The scheme covers three main aspects of the general building works: structural, architectural and mechanical and electrical. Developers are using CONQUAS increasingly to

promote and market their property developments. For instance, it is common for promoters to specify target CONQUAS Score in the tender contracts as targets for contractors. Similarly, contractors that are capable of delivering a consistently high CONQUAS Score would be in demand and command a higher premium. The other international scheme is the Agreement Certificates which is a Quality Appraisal Scheme of the British Board of Agreement (BBA). BBA's Agreement Certificate Scheme provides authoritative and independent information on performance of building products. The main focus of the Agreement process is the evaluation of the extent to which the product allows compliance with relevant Building Regulations and other statutory requirements. These two examples are very relevant for the industry in India to consider and adopt. During the Twelfth Plan period steps would be initiated to launch such schemes.

19.23. In the area of standards, Bureau of Indian Standards (BIS), is the statutory and apex organisation for laying down of standards and their adherence, but does not having any mandate for enforcement. Even the standards are recommendatory in nature, which prevent stake holders to strictly conform and follow. BIS needs to be granted necessary authority and powers to ensure serious adherence to Indian standards. The issue of shifting from Prescriptive to Performance Standards as well as formulation of standards on green and intelligent building design should be given high priority

R&D IN CONSTRUCTION SECTOR

19.24. R&D in construction sector needs to be built around a vision of delivering inclusive growth supported by collaboration between the research providers and the research users. In the field of construction sector in India the principal institutions involved in research include Central Building Research Institute (CBRI), Building Materials and Technology Promotion Council (BMTPC), Institute of Steel Development and Growth (INSDAG), Central Institute of Plastics Engineering and Technology (CIPET), National Council for Cement and Building Materials (NCB), Central Road Research

Institute (CRRI) and Research Designs and Standards Organisation (RDSO). The challenge for the construction industry in the coming years is to establish a framework which supports innovation, research, development, demonstration and use of knowledge for benefits to society at large. Such a framework would be built around integration of various technologies into viable assets; develop designs and practices for meeting the needs of climate control; develop new materials and construction techniques; asset management deploying ICT right from conceptualisation to construction; automation in design, construction and operation and risk mitigation. Apart from R&D in construction technology, adequate focus is required on construction materials to help answer questions like: which alternatives have the lowest resource inputs and environmental emissions and wastes throughout their life cycle?

19.25. R&D vision shall motivate towards an innovative sustainable and productive construction industry and shall ensure collaboration and alignment amongst policymakers and all sections of the construction industry supply chain. A clear objective and identification of well-defined research projects would accelerate development of an innovative mind-set and in time should cause users to demand change. Since the country has a variety of geophysical conditions with varying materials available locally, technology should be adaptable to local conditions. To enable that, regional technology centres with autonomous functioning coupled with accountability are required under a national level umbrella organisation which in turn should also be accountable. One of the aforementioned organisations, along with the participation of policymakers, associations, academic institutions and industry be mandated to spearhead the collaborative effort needed to drive the R&D initiatives in Construction Industry. Industrially advanced countries too depend on collaboration amongst all stakeholders to decide on policies and their implementation framework. It is also suggested that spending on research for construction industry, require special incentives (for example, 150 per cent tax exemption) to encourage such research.

CONSTRUCTION MACHINERY AND TECHNIQUES

19.26. Construction equipment accounts for 21–23 per cent of the total project cost and as such, variations in equipment pricing have a huge impact on the project costs. The prices of construction equipment vary according to the product. As per estimates by Off-Highway research, the sale of construction equipment is expected to reach 84,000 units by 2014, of which infrastructure and real estate sectors will account for 70 per cent. This translates into a CAGR of about 20 per cent over the next five years (2009–14) in sales of construction equipment. Over the years, the equipment used in construction has improved significantly to provide better productivity, safety and accuracy. Mechanisation ensures greater efficiency and reduces the need for skilled labour. It also enables access to hazardous areas where manual intervention is not possible. Developments in this area include: evolving sustainable construction practices; enhanced usage of precast products; close proximity radiography; concrete production and placement; earth moving and mining; automation to enhance productivity and safety; facilitate availability and deployment of construction equipment through incentives and penetration of good practices into rural construction sector and low cost housing.

PROJECT EXPORT IN CONSTRUCTION INDUSTRY

19.27. Indian Construction Industry had been very active in the overseas market, especially the Gulf in the decades of seventies and eighties, when Indian companies ventured out to fill the demand for construction activities, fuelled by oil boom. Between 1975 and 1980, Indian companies handled construction work worth nearly US\$ 5 billion. Out of this nearly US\$ 1.5 billion was repatriated back to India, mainly in the form of profits, wages and construction material exported abroad. But this trend did not last, and by mid and late 1980s the volume of contracts secured, fell down sharply. From US\$443 million in 1986–87 the contracts came down to just US\$98 million in 1995–96. Though this was mostly due to the prevalent political situation in the Gulf region, even then it was a major drop for the industry. There is a strong need to reverse this trend

through strong government support in aggressively marketing Indian products and services in construction in the overseas market. In order to boost export of both services and goods from Indian Construction Sector it is important to evolve and set up an institutional mechanism for maintaining operational and effective linkages with Indian Missions abroad. In selected countries with a high potential for project export the commercial sections of the missions may be strengthened by placing a representative of the Construction Industry to create awareness and provide strengthening of Indian Construction Industry and to facilitate industry constituents from India to participate in bidding process of selected projects and also explore possibilities of promoting joint ventures in India and abroad. This would also attract greater FDI and new technologies in the domestic construction sector.

FINANCE AND RELATED ISSUES IN THE CONSTRUCTION SECTOR

Flow of Funds into the Construction Sector

19.28. Even though the construction sector is attracting both domestic (gross bank credit) as well as foreign direct investment, more resources are needed for the sector to fulfil the ever rising pressures of enhancing the housing and infrastructure sectors in the country. Institutional financing of construction

sector still remains an underdeveloped area. Table 19.2 shows the flow of bank credit to construction sector during 2006–07 to 2010–11. In the year, 2010–11, around ₹50,135 were lent by banks to the construction industry which was 1.4 per cent of the gross bank non-food credit disbursed during the year. Table 19.3 depicts the year wise and cumulative FDI flows into construction activities including roads and highways sector. The cumulative FDI inflows from April 2000 to August 2011 into construction activities stood at around US\$ 9,417 million or ₹42,072 crore, which is nearly 6 per cent of the total cumulative FDI inflow into the country during same period.

EXISTING SHORTCOMINGS IN INSTITUTIONAL FINANCING FOR CONSTRUCTION INDUSTRY

19.29. The Indian construction industry is faced with high operation, maintenance, and financial costs. As the magnitude of housing shortage in the country is huge requiring substantial investments in housing and related infrastructure, the Banks, Financial Institutions and Housing Finance Companies have not lent to the poorer segments of the population for affordable housing segments. The priority sector lending by Banks for affordable housing loans up to ₹5 lakh constitutes only 22.75 per cent, of the total lending to housing sector according to the housing loan data received from the 26 leading public sector banks including SBI for the year 2010–11. Further,

TABLE 19.2
Flow of Bank Credit to Construction Sector

	2006–07	2007–08	2008–09	2009–10	2010–11
	(in ₹ '000 Crore)				
Gross Bank Non-Food Credit	1,801	2,205	2,602	3,040	3,667
Bank Credit to Construction Industry	20	28	39	44	50
Percentage share (%)	1.1	1.3	1.5	1.5	1.4

Source: Annual Reports, RBI.

TABLE 19.3
Flow of FDI in Construction Activities (including Roads and Highways)

	2007–08	2008–09	2009–10	2010–11	Cumulative(April 2000–August 2011)
In ₹ Crore	6,989	8,792	13,469	4,979	42,072
In USD million	1,743	2,028	2,852	1,103	9,417 (6% of total FDI inflows)

Source: DIPP, MoC&I.

as per latest BSR report of RBI for the period ended March 2010, loan sizes up to ₹5 lakh constitutes 24.16 per cent of the total outstanding housing loans of ₹3,06,307 crore. It can thus be safely concluded that a very low proportion of the low ticket loans have actually gone to the EWS/LIG individuals. Mortgage penetration is already low in India and mechanisms are only now developing to maintain credit histories. Informal sector workers in particular have variable income streams and in some cases, might not have access to a bank account.

19.30. Key reasons for the reluctance on the part of banks/FIs to lend to the construction industry include: (i) lenders do not understand the working dynamics of the construction industry; (ii) lack of adequate safeguarding mechanisms to assure the banks about the credibility of the industry and (iii) banks have better options to lend their precious money to sectors with assured returns at much lower risks. There is no appropriate institutional set up to absorb the flow of funds to the construction sector. Apart from non-availability of credit for the sector, non-availability of bankable DPRs in the construction sector and huge time and cost overruns of the construction projects are some of the reasons for projects in the construction sector not taking off in a sustainable manner. Another shortcoming in the construction sector in India is that the State Governments do not make funds available after they approve the projects. There is no law to ensure that a contract cannot be awarded unless finances are arranged. A programmatic approach for large construction programmes at the State level requiring a planned approach with resources tied up needs to be encouraged.

STRATEGIES TO IMPROVE FLOW OF FUNDS TO CONSTRUCTION INDUSTRY

19.31. Although the industry is not fixed capital intensive, it is working capital-intensive in terms of gross working capital requirements with high payment receivable risk. Five types of financing requirements can be identified in respect of the Construction Industry: (i) working capital requirements; (ii) Capital requirements for modernisation of equipments and/or expansion of industry;

(iii) Project specific bridge loans; (iv) Loans for BOT projects; and (v) Equity for BOT and real estate project. The funds requirement of the construction industry is approximately USD 1 trillion with the modernisation requirements of the construction industry estimated to be to the tune of US\$150–200 billion. Further, as per the High Powered Expert Committee (HPEC) Report for estimating the investment requirement for urban infrastructure services, the investment requirement for urban infrastructure over the 20-year period (2012–31) is estimated at ₹39.2 lakh crore at 2009–10 prices.

19.32. The construction sector remains in need of financial support while sizable funds available with Banks and Financial Institutions remain unutilised. Lenders do not have a reasonably sound and reliable system for risk assessment in the construction sector. In order to have a sustained and enhanced flow of credit to the construction sector, greater transparency, better corporate governance, sharing of experiences and specific regulations are required. Innovative financing methods or instruments are required to enhance the flow of funds and institutional credit to the construction sector. Various strategies for this are:

- Enhancing flow of finance through grading of construction companies
- Construction industry-specific lending norms
- Credit enhancement product or agency which would provide bridge finance to the construction sector on lines of the ₹300 crores partial guarantee facility launched recently by IIFCL for the infrastructure sector
- Setting up of a Mortgage Refinance Company which would be a financial institution owned by the banks with the sole purpose of supporting banks to do construction mortgage lending by refinancing banks' mortgage portfolios
- Setting up of a Construction Bank especially dedicated to suit the sector's financial needs on lines of countries like China, Singapore and Ethiopia
- Indian Infrastructure Equipment Bank which would make use of construction equipment owned by Companies by putting them to productive use when they are unutilised

- Compulsory Escrow accounting for Construction Projects in order to provide credit cushion to the investors
 - Letter of Credit may be opened in the name of the contractor at the time of award of project by the Client to ensure that the payment is made as soon as the project milestone approval is received
 - Working capital advance may be provided to contractors in order to kick-start the construction project
 - 'Delayed Payment Act' for Construction Projects which would make it mandatory for the clients or big contractors to pay the small contractors the money along with the prevailing interest rate, the cases where contractors are not paid by the clients in time
 - Lending and Non-Performing Assets (NPA) norms for construction sector may be reviewed and reformed
 - Sector-specific (for example, housing, real estate, Power, Roads, Ports, and so on) innovative financing instruments may be developed to enhance the flow of funds to the specific sectors
 - Innovative financing instruments/products like 'Insurance Product', 'Housing Warranty' and 'green construction finance' (and green rating other than LEED and GRIHA) may be explored for enhanced and orderly flow of institutional credit to the construction sector
 - The possible credit enablement mechanisms/ financial instruments for affordable housing are given the Box 19.1
 - Developing Housing Warranty Scheme as being offered to the consumers in the Developed Countries, (for example, Japan, North America and so on) could be a potent instrument for covering risk elements at micro level for houses and buildings/ structures
 - Developing Insurance Products to mitigate construction business risks to cover the risk elements Bidding Indemnity Policy (BIP); Delay in meeting obligation by client policy (DIMO Policy); Settlement of Claims Policy (SOC Policy); Loss of Profit Policy (LOP Policy); Transit Insurance Policy (TI Policy); Loss of Performance of Construction Equipment (LOPCE Policy); Force Majeure Loss Policy (FML Policy); Financial Risk Coverage Policy (FRC Policy)
 - Fiscal incentives such as allowing resource mobilisation through tax-free bonds
 - Accessing International Financial Markets through External Commercial Borrowings (ECB), Infrastructure Debt Funds (IDFs), Global Depository Ratios (GDR) and other debt instruments
 - Infrastructure Debt Funds (IDFs) to deepen the corporate bond market to make it attractive for these investors
 - Foreign Private Equity and Venture Capital Funds
 - Regulatory reforms required for PE and VC for fulfilling their role as growth enablers a host of regulatory changes
 - Builders and Real Estate Developers involved in construction sector may be incentivised to take up affordable housing construction through grant of additional FAR/FSI/TDR and appropriate fiscal incentives
 - State Plan Document should have a Chapter on construction sector which would clearly mention the construction financing requirements in the state
 - Single Window Clearance to reduce the hassles and delays in the approval process resulting in delay in completion of projects
- 19.33. Obviously, such a vast financial requirement cannot be addressed by a single enterprise or institution. Government initiatives must be in coordination with all the constituents of the construction industry for dedicated flow of credit to the sector. Workable Action Plans incorporating the above suggestions would be made during the Twelfth Plan period.

TOURISM

TOURISM AS A MEANS TO FASTER, MORE INCLUSIVE AND SUSTAINABLE GROWTH

19.34. The tourism sector has a major role to play to promote faster, sustainable and more inclusive economic growth—the goal of the Twelfth Five Year Plan. It has better prospects for promoting pro-poor growth than many other sectors. This is because tourism involves a collection of activities, services and industries comprising transportation,

Box 19.1 Financing Instruments for Affordable Housing

1. Credit enhancement mechanisms like Setting up of '*Credit Risk Guarantee Fund*' need to be expedited.
2. A city level dedicated fund for financing urban infrastructure/amenities including affordable housing need to be created which may finance affordable housing including slum housing programmes. Resources can be pooled to this Fund through land monetisation and other innovative sources of funds, contributions from Federal/State/Local Governments, HFCs, Banks, Financial Institutions/Corporate Bodies, levy of labour cess/slum upgradation cess/service tax on construction; and Multi-lateral/bi-lateral bodies. There is a need to look at workable models for Social Rental housing which can be driven through private sector with conducive legal/regulatory environment. In this context, the options of issuing '*Rental Housing Voucher*' may be explored.
3. Set up Apex Institution by Government of India for Financing/re-financing *Housing Micro finance* by MFIs. Development of a robust micro-mortgage market for mitigating risk of providing institutional credit in EWS/LIG segment may be explored.
4. Banks lending for affordable housing upto certain limit should be provided *with 1 per cent of the loan amount as incentive for covering their operational costs*.
5. Banks/HFCs may be permitted to *float tax-free infrastructure bonds* to raise cheaper funds and reserve for affordable housing so that they can reduce the lending rates for EWS/LIG housing loans.
6. Interest Subsidy may be enhanced and targeted for affordable housing. Other Subsidy methods like interest-cum-capital subsidy may also be worked out Incentives to private builders for creation of affordable/ rental housing stock through appropriate tax incentives, low cost credit and other incentives like *additional FAR/FSI/TDR* and so on may be provided.
7. *Pre-finance and start-up capital* may be provided to NGOs/CBOs for taking up affordable housing programme for the poor.
8. Substantial enhancement of *transfer of funds from Federal/State Govts to Local Governments*. To avoid time and cost over runs, there should be no delay in transferring Land required for projects of affordable housing and slum rehabilitation programme to ULBs.
9. Enable Municipal Bodies to raise resources through tax-free bonds and transfer of Government land.
10. Municipal Governments should be given a part of the profit earned by the Development Authorities/Improvement Trusts as suggested by the 2nd Administrative Reforms Commission and Thirteenth Finance Commission to create a revolving fund for affordable housing.
11. Specific dispensation for affordable housing at municipal level should be considered in the forthcoming Goods and Services Tax (GST).
12. Initiatives under service level benchmark for water, sanitation and solid waste, as per Thirteenth CFC recommendations, should include specific coverage of affordable housing.
13. Short-term construction finance should be made available to municipal bodies to meet the immediate shortfall of funds due to delayed transfer of funds and receipt of beneficiary contribution.

accommodation, eating and drinking establishments, retail shops, entertainment businesses and other hospitality services provided to individuals or groups traveling away from home for leisure, business or other purposes. The broad scope of economic activities involved enables wide participation in its growth, including participation by the informal sector. Tourism is also highly dependent upon natural capital (for example, forest, wildlife) and culture and these are assets that some of the poor have, even if they have no financial resources. For all these reasons, across the world, the tourism industry is one of the largest generators of employment. In India, the

travel and tourism sector is estimated to create 78 jobs per million rupees of investment as compared to 45 in the manufacturing sector. The role of tourism in promoting inclusive growth was also recognised in the meeting of Heads of States of G-20 countries held in June 2012 in Mexico.¹

19.35. While Tourism is important for both growth and employment generation, it must also be sustainable. The World Tourism Organization (WTO) has defined sustainable tourism as 'leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while

maintaining cultural integrity, essential ecological processes, biological diversity and life support systems.’ In 1992, the ‘Earth Summit’ in Rio established the triple principles of environmental, economic and social sustainability. Since then, the principles of sustainable tourism have been adopted by the tourism industry worldwide. In India, the tourism sector is based on exploiting its unique endowments of biodiversity, forests, rivers, and its rich culture and heritage. The challenges in this sector lie in successfully preserving these in their original form, and making them accessible to domestic and international travellers. Tourism in India has the potential to create economic interest of local communities in the protection of its natural and cultural endowments leading to a more *sustainable growth*.

19.36. The Twelfth Plan envisages a growth rate of 4 per cent in the agricultural sector, 8 per cent in the manufacturing sector and 9.1 per cent in the services sector. The annual growth of the Tourism sector is estimated to be 8.1 per cent during the last five years, which is marginally higher than the overall economic growth of 7.9 per cent expected to be achieved during the Eleventh Five Year Plan. Under the *business-as-usual* scenario, the tourism sector is forecasted to grow by 8.8 per cent per annum during the period 2011–21 even though, according to the World Travel and Tourism Council (WTTC), tourism in India has the highest 10-year growth potential in the World during 2009–18. The expected growth of the tourism sector is, therefore, inadequate both in terms of its contribution to the overall economic growth and its potential. The approach to tourism in the Twelfth Plan must focus on achieving a substantially higher growth rate than the aggregate growth rate envisaged so as to provide a cushion against any shortfall in other sectors.

19.37. In view of the above, the Twelfth Plan must evolve a strategy based on the ability of tourism to promote a more inclusive, sustainable and faster growth in the face of resource constraints. Tourism should be accorded a priority status to enable the Government to achieve its planned growth and employment objectives and foster national integration.

REVIEW OF ELEVENTH PLAN

19.38. For the Eleventh Five Year Plan (FYP), the vision for the tourism sector was ‘to achieve a superior quality of life through development and promotion of tourism through a multi-pronged strategy, that is, (i) *Position and maintain tourism development as a national priority*. In spite of this, the global ranking of India in respect of ‘Government Prioritization of the Travel and Tourism Industry’ declined from 59 in 2006 to 80 in 2010.² (ii) *Improve and expand the development of product and infrastructure for destination/circuits*. This was sought to be achieved through the centrally-sponsored scheme ‘Product/Infrastructure Development for Destination and Circuits’ (PIDDC). In spite of these initiatives, the global ranking of the level of tourism infrastructure in India (measured by the number of hotel rooms, number of ATMs accepting visa cards and the presence of major car rental companies) improved only marginally from 96 in 2006 to 89 in 2010.³ (iii) *Develop and implement an effective programme for marketing of brand ‘Incredible India’*. While both central and State Governments allocated a significantly large proportion of their plan outlay on tourism on marketing and social awareness campaigns, the effectiveness of the marketing strategy is questionable. The global ranking of India in respect of ‘Effectiveness of Marketing and Branding’ declined from 59 in 2006 to 63 in 2010.⁴ (iv) *Build capacity of service providers in the tourism sector*. The Central Government launched a scheme to create and upgrade adequate institutional infrastructure for training and certification of manpower resources; and (v) *To enhance and maintain India’s competitiveness as a tourism destination*. During the Eleventh Plan period, the global ranking of India in the Travel and Tourism Competitiveness Index improved from 65 in 2006 to 62 in 2008 and thereafter fell to 68 in 2010 due to increase in out-bound Indian tourists from 8.34 million in 2006 to 12.07 million in 2010.

TARGET FOR TWELFTH PLAN

19.39. Under the business-as-usual scenario, the tourism sector is forecasted to grow by 8.1 per cent per annum only during the period 2011–21 even though, according to the World Travel and Tourism

Council (WTTC), tourism in India has the highest ten-year growth potential in the World during 2009–18. The currently projected growth of the tourism sector is, therefore, inadequate both in terms of its contribution to the overall economic growth and its potential, and the Twelfth Plan must target a significant improvement.

19.40. The direct employment in the tourism sector has registered an annual growth rate of 2.04 per cent during the six-year period 2004–05 to 2010–11. The employment elasticity with respect to value-addition in the tourism sector is estimated to be 0.28 during the same period. This is substantially lower than the estimated world-wide employment elasticity of 0.65 in the tourism sector. Therefore, there is significant potential for the tourism sector in India to absorb a substantially larger workforce.

19.41. In the aforesaid context, three alternative scenarios are presented in Table 19.4.

TABLE 19.4
Alternative growth scenarios of tourism

Scenario	Growth in Value-addition	Growth in employment	Creation of New Jobs over Plan period
Scenario—I	10 per cent	4.0 per cent	5.5 million
Scenario—II	11 per cent	4.4 per cent	6.1 million
Scenario—III	12 per cent	4.8 per cent	6.7 million

19.42. The growth in direct employment is estimated on the assumption that in the medium term it may not be feasible to sharply raise the employment elasticity to the international level but will increase to 0.4 during the Twelfth Five Year Plan.

19.43. The T&T Competitiveness Report⁵ ranks India at 12th in the Asia Pacific region and 68th overall, out of 139 countries in the Travel and Tourism Competitiveness Index for 2011 down six places since the Index of 2009. India is well assessed for its natural resources (ranked 8th) and cultural resources (24th), with many World Heritage sites, both natural and cultural, rich fauna, many fairs and

exhibitions, and strong creative industries. India also has quite good air transport (ranked 39th), particularly given the country's stage of development, and reasonable ground transport infrastructure (ranked 43rd). However, some aspects of its tourism infrastructure remain underdeveloped (ranked 89th), with very few hotel rooms per capita by international comparison and low ATM penetration. Another area of concern is the policy environment, which is now ranked 128th, with much time and cost for starting a business, bilateral Air Service Agreements that are not assessed as open, and visas required for most visitors. Other areas requiring attention are health and hygiene standards (112th) and the country's human resources base (96th). It is imperative to point out that India has the advantage of a strong domestic tourism base which is likely to further grow on the back of a rapidly rising middle class with increased disposable incomes and awareness. However, much of the domestic tourism is 'low end' and the challenge is to persuade 'high end' domestic tourists to substitute domestic tourism for foreign tourism by upgrading the tourism related infrastructure and the quality of tourism services.

19.44. In spite of low rankings on the Competitiveness scale, India can leverage its higher ranking in certain categories to exploit its tourism potential over the next decade with proper planning. This potential, exploited in an intelligent and sustainable manner, can prove to be the proverbial engine of growth for India. This can be achieved only with active cooperation from the States/UTs.

19.45. The approach to tourism in the Twelfth Plan must focus on achieving a substantially higher annual growth rate of 12 per cent in the value addition in the tourism sector during the Twelfth Five Year Plan. The strategy for promoting tourism should be re-oriented to increase the employment elasticity in the tourism sector to the international level. Further, India should strive to be amongst the top 50 countries in the Travel and Tourism Competitiveness Rankings by the terminal year of the Twelfth Five Year Plan and increase the share of India to 1 per cent in Global foreign tourist arrivals.

STRATEGY FOR DEVELOPMENT OF TOURISM DURING TWELFTH PLAN

19.46. Tourism in India has the potential to promote faster, sustainable and more inclusive growth. However, during the Eleventh Plan period this potential could only be partially realised. In the Twelfth Five Year Plan period, it is necessary to re-orient the strategy so as to achieve the targets set-out in the earlier section.

19.47. The traditional approach to tourism development is a direct result of an extremely open and deregulated world economic environment. This approach is characterised by inequity in redistribution of economic benefits. Over the last two decades, new non-traditional approaches like eco-tourism⁶ which are concerned more with ecological and cultural conservation than poverty reduction have become popular. The aim is more on minimising costs on people's lives rather than bringing benefits to them. The approach for development of tourism in the Twelfth Five Year Plan should be re-oriented to eliminate poverty.

19.48. The *Approach Paper* to the Twelfth Plan released by the Planning Commission lays down the overall strategy for enabling tourism to realise its potential. It emphasises the need to adopt a 'pro-poor tourism' approach aimed at increasing the net benefits to the poor from tourism and ensure that tourism growth contributes to poverty reduction. The benefits may be economic, social, environmental or cultural. For this purpose, the Approach Paper identified the need for developing a comprehensive set of strategies for a diversity of actions, from micro to macro level, including product and infrastructure development, marketing, branding and promotion, planning, policy and investment and increasing the spread of benefits to the weaker sections. It also prescribes that the 'principal strategy' to realise the tourism potential of India's enormous assets, namely historical sites, places of religious significance, and its vast range of national attractions, must be to focus on developing clusters or circuits around such assets. The development of these clusters/circuits requires collaboration between many agencies at the local level to create an attractive and safe

transit experience. Therefore, development of tourism requires that States take a leading role in developing their own tourism potential to obtain growth in employment as well as State Domestic Product.

19.49. Pro-poor tourism is increasingly becoming popular but there are not many places in the world where this initiative has been effectively implemented in line with pro-poor tourism principles. In 2006, the Kerala Department of Tourism proactively decided to make the state tourism policies more 'pro-poor' through the framework of Responsible Tourism (RT) Initiative. Under this initiative, development of tourism in Kumarakom was taken up as a pilot destination. The initial phase was characterised by local farm land being converted into tourism infrastructure, reduction in agricultural production and increase in wage income of the local workers from the hectic pace of construction activity. However, it soon became apparent that the gap between the tourism industry and the local population was rapidly widening. Most villagers eventually got into financial difficulties after losing their land and no meaningful skills with which to operate tourism activities.

19.50. Eventually it became apparent that the local people in Kumarakom were not benefitting from the new tourism businesses. While many job opportunities were created with the opening of hotels and restaurants, they could not be availed by the local people since the local wages were substantially higher than those in other parts of the country. Over 80 per cent of the hotels' staff was recruited from outside Kumarakom; a significant number of them were from Northeast India, the poorest part of the country. Further, the working conditions in the tourism sector were very poor: workers had no job security, there were many cases of broken contracts without sufficient reasons and employees were poorly paid.

19.51. Besides, the locals in Kumarakom became victims of the tourism industry in many other different ways. Villagers' lifestyle and occupations were closely related to the canals, bays, lakes and shores in the area that have been using for fishing, collecting shells, or as a mean of transportation. However, many resort-owners closed the access to lakes and

canals for the local community in order to satisfy the tourists' need for privacy and tranquillity. In addition, resorts increasingly operated tourist cruises in the backwaters by motorboats, which have considerably damaged the fishing nets used by local fishermen. A survey conducted by Equations in 2002 among 140 households in the village shows that tourism expansion has not meaningfully contributed to infrastructure development and improvement of the living standards of people of the community. Responding to the query whether development of tourism in Kumarakom has improved the overall development of the region, 62 households responded that tourism had not made any significant contribution to improving roads or transportation system. Similarly, 87 households responded in the negative regarding the supply and quality of water, 90 households responded in the negative for the electricity, and 99 responded in the negative on the possibility of getting an employment.

19.52. The Department of Tourism of Kerala declared the place as a pilot destination for Responsible Tourism in 2007 but it was extremely difficult to commence work on the project due to local resistance. It was possible to start the implementation of the initiative only after the Panchayat representatives and officials from the Kerala Department of Tourism organised a mass meeting in May 2007 to explain the schedule, the means, aims and objectives of the RT initiative and the key players involved.

19.53. The first objective was to revive the agricultural sector in Kumarakom. The Department of Tourism sought the help of Kudumbashree, the Panchayat and Kerala Institute of Travel and Tourism Studies (KITTS) to conduct a survey and analysis of the possibility of linking the local population with the tourism businesses and market. For this purpose, first, KITTS identified the most vulnerable groups, that is, families of farmers living below the poverty line and the local producers who had difficulty in accessing the market to sell their produce. In addition, KITTS researchers conducted a survey of the hotels and restaurants to establish their exact requirement for fruits and vegetables. Based on the survey results, the Destination Level Responsible

Tourism Committee (DLRTC) cell prepared an agricultural calendar for the supply of produce to the hotels, that is, what should be cultivated and when, and the overall amount that will be needed by the hotels. This process made it possible for the local self-government to establish the link between the local farmers and the hotels. Consequently, 18 hotels and resorts agreed to purchase their vegetables, fruits, and so on, exclusively from local producers.

19.54. In spite of the agreement, the hotels and resorts refused to buy the local produce when all the crops were ready for harvest in February 2008. Most of them argued that Kumarakom produce were too expensive relative to neighbouring Tamil Nadu. The crisis was averted only with the firm intervention of the State Government; the hoteliers and resort owners were firmly requested to co-operate with the initiative and respect the agreement. Two weeks later, 15 hotels, among them the luxury Taj Resort and Lake Resort, made a written and formal agreement with DLRTC and the Panchayat to purchase the produce from the local farmers. The first sales of the produce were made to the hotels and resorts on 18 March 2008. The farmers and tourism business owners now enjoy a healthy working relation. The RT initiative in Kumarakom has reached 1,350 direct beneficiaries through this agricultural project.

19.55. The RT initiative has produced several real and quantifiable results within one year of its implementation. Some of the important outcomes are significant increase in local agricultural production, creation of a cultivation calendar, creation of systems for steady prices to avoid inflation and market fluctuations, creation of 10 Karshakasamity (farmers groups), with a total of 460 people, creation of 20 Kudumbashree units, with a total of 250 women, creation of five Micro Enterprises focused on women, one women fish processing unit, one women chicken processing unit; one women Chapathy (local bread) processing unit and two coconut supply units.

19.56. One year after the initiation of the RT in Kumarakom, new projects were developed to enable local people to access the tourism market and benefit from it. A link between several tourist hotels

and some local artists was established whereby, the hotels agreed to buy products, services or performances from two handicraft units, one women's cultural group performing Thiruvathirakaly (traditional Kerala dance art), and one women's painting group. Besides providing additional income for the art performers, this project also enables the promotion and conservation of the traditional art forms from Kerala, and avoids the usual cultural breakdown that happens when tourism is developing in a destination.

19.57. In July, 2009, a new initiative called the 'Village Life Experience @ Kumarakom' was launched. Under this initiative, the tourists are taken around villages to have a real experience of the village life where they can enjoy a visit to a fish farm; vegetables and fruits farm, duck farm, paddy fields, and can also learn a bit about the traditional fishing techniques. The cost for a half-day trip is about ₹1,000 and the amount of money earned is equally divided among the villagers who participate in the tour.

19.58. Further, there is also a very special role for women in the Responsible Tourism initiatives and projects. In co-operation with Kudumbashree, 760 women are included in the cultivation programme, 35 in retail activities, 30 in art and cultural groups, and 45 in the village tour group. This is an important step toward women empowerment in Kumarakom; these groups of women are now participants in decision making for the programme. In such a way, a carefully managed tourism industry can help the poor rural women to become increasingly empowered, improve their status in their families and within the society.

19.59. The learning experience from the implementation of the pilot project in Kumarakom, Kerala provides a successful pro-poor tourism model for replication across the country with such localisation as may be necessary.

19.60. In view of the above, a 'pro-poor tourism' approach should be adopted for development of tourism and furthering the objectives of the Twelfth Plan. The goal of 'pro-poor tourism' is to bring net benefit to the poor and marginalised through

tourism activities thereby, eliminating poverty. The means to achieve this goal is to expand the opportunities for them through capacity building and transfer of skills in close co-operation with the education and training sector and microfinance institutions. 'Pro-poor tourism' has a holistic notion of poverty alleviation. Non-economic benefits are as important as economic gains. An improved management approach of the tourism industry can provide new skills, better access to education and health care, improving access to clean water and transportation networks. Intangible benefits may also be provided such as access to information, opportunities to communicate with the outside world, increased access to market opportunities, strengthening the community institutions and structures, and enhancing community pride.

19.61. 'Pro-poor Tourism' is essentially about redistribution of resources and opportunities and not just the creation of a new tourism product. Therefore, a proactive interventionist approach is needed from the governments in order to effectively realise the objective of the concept. Since the poor and marginalised communities do not have the avenues to negotiate with tourism companies, the authorities have the responsibility to advocate for and promote their interests. Governments need to change their policies and create new ones that cater for the needs of the marginalised within the tourism industry framework. Without such actions at the macro level, 'pro-poor tourism' may remain a niche market without addressing the larger picture of poverty reduction objective.

19.62. The 'pro-poor tourism' approach comprises of practical strategies based on the principles underlying the approach. These practical strategies essentially focus on three core areas: increased economic benefits, positive non-economic impacts, and policy/process reform. In each area three distinct (but often overlapping) methods can be identified.

19.63. The *increased economic benefits* can be achieved by (i) expanding business opportunities for the poor; (ii) expanding employment opportunities for the poor; and (iii) enhancing collective benefits.

Business opportunities for the poor can be expanded by enabling them to set up small enterprises, particularly in the informal sector. The main activities in this area should be enterprise support, expansion of markets and development of complementary tourism enterprises, such as craft initiatives and cultural displays. Local enterprises need to be developed to supply the tourism industry itself (for example, with accommodation, food and materials). A wide range of measures will have to be used to overcome the multiple barriers to economic participation (such as lack of credit, inappropriate social organisation, insecure tenure and remote location). Since local entrepreneurs generally lack entrepreneurial skills to engage with private operators in the formal tourism sector, training will need to be a key intervention. Further, there is a need to combine supply side measures (developing products and skills directly with the poor) with measures to expand demand for the products and services of the poor amongst tourists and operators. Supportive NGO-type organisations dedicated to supporting small enterprises need to be encouraged to assist them. *The employment opportunities for the poor* can be expanded by ensuring that the investors and operators in the formal tourism sector are committed to source employment locally thereby, also benefitting from low staff turnover. However, the jobs should not be concentrated among few families and the better off in the local community. Further, focus must also be placed on pursuing skills development to enable local community to take up skilled jobs which may be created. *The collective community income* can be enhanced, inter alia, through levies on tourists and operators; equity partnerships in which the community holds a stake; lease fees paid by private operators; and donations from tourists. However, it is necessary to develop strong, accountable and transparent community organisations to ensure that the collective income is not misused. The enhanced collective benefits can spread benefits well beyond the direct earners.

19.64. The *non-economic benefits* can be increased by (i) Capacity building, training and empowerment; (ii) Mitigating the environmental impact of tourism on the poor; and (iii) Addressing social and cultural impact of tourism. *Capacity building* is central to the

strategy in increasing non-economic benefits since the poor often lack the skills and knowledge to take advantage of opportunities in tourism. Investment in capacity building is essential but a long-term process. The main focus should be on increasing poor people's basic understanding of tourists and the tourism industry; training in business skills; and local institutional capacity building for empowerment. *Environmental sustainability* is an important element of 'pro-poor tourism' since tourism can lead to displacement of the poor from their land and/or degradation of the natural resources on which the poor depend. Therefore, tourism should be integrated with broader rural development work that includes natural resource management activity. The *social and cultural impact of tourism* can be addressed by promoting cultural tourism which allows for capitalising on cultural assets which are predominantly owned by the poor. Similarly strategies should be designed to improve local infrastructure, health care and access to information and communication.

19.65. *The policy/process reform should focus on* (i) promoting participation; (ii) bringing the private sector in the formal tourism sector into business partnerships with small local entrepreneurs; and (iii) building a more supportive policy and planning framework. *Participation* can be promoted by enhancing the participation of the local community⁷ in decision-making. Tourism should be integrated into the participatory district planning process as one of a range of opportunities for local economic development. *The private sector in the formal tourism sector should promote business partnerships* by acting as an important market for the products of small entrepreneurs (for example, goods and services purchased for a lodge). Private companies, particularly tour operators and agents, should also channelise their own clients to small enterprises of the local community. The formal tourism sector will need to take responsibility for developing local, skills marketing links, and commercial expertise of locally driven tourism enterprises. *The policy and planning framework* can be a strong enabler of 'pro-poor tourism'. Therefore, there is a strong case for reform. Some of the most influencing strategies include promoting participatory planning; increasing communication

with Government and establishing a voice for small producers; lobbying government for supportive policies and legislation—both within tourism and in other sectors (for example, land tenure, infrastructure, local planning); lobbying the local conservation authority to invest in destination marketing and infrastructural development and to lift restrictions on development; promoting inter-departmental initiatives and coordination; linking with the national tourism authority; and using Government's power to allocate concessions to influence investors.

19.66. In general, *tourism provides better opportunities for women's participation* in the workforce, women's entrepreneurship, and women's leadership than other sectors of the economy. Women in tourism are still underpaid, under-utilised, under-educated, and under-represented; tourism offers pathways to success. The 'pro-poor tourism' approach should be a vehicle for furthering the advancement and empowerment of women who constitute a large proportion of the most vulnerable in the local community. The Global Report on Women in Tourism 2010 has made a set of recommendations for increasing the participation of women in tourism which should form the agenda for increasing participation of women in tourism. These recommendations need to be integrated into the 'pro-poor tourism' approach to enhance the 'inclusive' agenda for the Twelfth Plan.

19.67. The implementation of various strategies for development of tourism would involve developing formal and informal links between all stakeholders and coordination across all levels of Government. It would be necessary to establish a 'whole government' agenda for tourism development between departments at national level and between national and local government so as to create convergence and synergy across programmes. This requires that awareness is created amongst all stakeholders and across Government about the contribution of tourism to local livelihoods and engage them in joint initiatives to increase the local economic development and impact on poverty reduction. *The National Tourism Policy should reflect clear progress in 'tilting' tourism to unlock more opportunities for the poor.*

It should form an integral part of the poverty reduction strategy during the Twelfth Five Year Plan.

19.68. The realisation of the country's huge, barely tapped, tourism potential is contingent upon simultaneously addressing the multiple challenges thrown up by capacity constraints and inadequate policies. These constraints include inadequate transportation infrastructure; accommodation; land; multiple taxes and an overall high tax burden; inadequate financial resources for enterprises; skills; safety and hygiene conditions around tourist attractions; and convergence of actions by multiple agencies. The challenges are further magnified in the context of a federal structure where the responsibilities for policymaking and implementation fragmented across levels of government and co-ordination between them is often lacking.

DEVELOPMENT OF TOURISM INFRASTRUCTURE

19.69. Availability of good infrastructure is one of the essential requirements at selected tourist destinations. The infrastructure for tourism includes travel infrastructure networks like airports, railways, roads, waterways, telecommunications; amenities like electricity, water supply, drainage sewerage, solid waste disposal systems and tourism facilities, services and amenities like accommodation, restaurants, recreational facilities and shopping facilities. The operation of tourism facilities, services and amenities are often dependent on a number of travel infrastructure networks. The most usual case in tourism development is for infrastructure development to precede the completion of the tourism facilities. This means that the installation of the infrastructure becomes a public sector responsibility. The case for infrastructure services being a public sector responsibility is based on the consideration that the network of services is available to both tourists and residents of the area *and* the construction of an integrated system would also facilitate non-tourism development within the region.

19.70. In terms of the federal framework of the Constitution, the responsibilities of the Union Government and the State/UT Governments are elaborated in separate schedules to the Constitution.

The Central Government is responsible for matters such as external affairs, visa regulations, foreign exchange regulations and import/export procedures, while the State/UT Governments are responsible, inter alia, for law and order, land use, civic amenities, shops and establishments. These Governments have separate agencies for dealing with specific subjects and regulations. For example, the Ministry of Tourism in the Union Government is concerned with the over-all coordination and planning of tourism development in the country and for undertaking tourism promotion and publicity in the international market. However, the State/UT Governments control all factors of production including land in their territories. Further, there is empirical evidence to suggest that a significant proportion of their tax revenues is attributable to consumption by tourists. Therefore, the State/UT Governments have the responsibility and the incentive for facilitating the creation of infrastructure for tourism. The role of the Union Government is restricted to establishing a policy and regulatory framework, creating the appropriate incentive structure and synergising the activities of different infrastructure sectors across levels of government and supplementing these efforts by financial assistance.

19.71. The strategy for development of tourism infrastructure should essentially focus on identifying clusters of habitations/destinations having unique craft, ethnic art form, culture and heritage, natural spots for development as tourism products and develop tourist circuits/destinations around them on a Mission Mode with the active participation of local communities. As part of this strategy, State Governments should be expected to identify at least *one integrated tourist circuit*, map all the tangible and intangible natural and cultural assets along the circuit, estimate the sustainable destination carrying capacity and undertake a gap analysis of the travel infrastructure network and tourism facilities, services and amenities. Based on this, a comprehensive integrated physical and financial plan should be prepared through a community participatory process. The Plan should identify, inter alia, the winners and losers, agencies responsible for executing the sub-components of the plan and the timelines

for achieving the milestones. The integrated plan should be approved and monitored by the Ministry of Tourism as part of the Product/Infrastructure Development of Destination and Circuits Scheme (PIDDCS). To the extent there is shortfall in the financing of the plan, the same may be considered for financing under the PIDDC subject to a ceiling there under. The PIDDC scheme should also be modified along the lines recommended in the Report of the Steering Committee to the extent they are not inconsistent with the recommendations in this Chapter.

19.72. Easy access to tourism destinations in terms of international transport and facilities for easy movement within the destinations are prerequisites for the development of tourism. India ranks 39th and 43rd in the Travel and Tourism Competitiveness Index 2011 for Air Transport Infrastructure and Ground Transport Infrastructure respectively. However, its rank in respect of Airport density is as low as 135 from amongst 139 countries and 90 in respect of quality of roads. India's ability to open up new areas and properly service emerging tourism resorts, while also providing access to natural tourism attractions and circuits for tours will significantly depend upon its ability to quickly improve the airport density and quality of rail and roads. The existing Pradhan Mantri Gram Sadak Yojana (PMGSY) and other schemes of the Central Government could be used to improve the quality of transport infrastructure.

19.73. In terms of investment, especially private investment, tourist accommodation represents the most expensive facility in tourist resorts. In the past few decades, the character and composition of tourist accommodation has undergone considerable change. New types of accommodation, such as self-catering units, home stay, budget hotel accommodation and camping sites, have evolved to meet market demands for increased levels of independence, self-sufficiency, informality, economy and convenience. Such changes have been influenced by the emergence of the new types of travellers and the tourists who invest in a holiday home or unit in a preferred tourism destination. As the spectrum of travellers has undergone transformation, there have also been

changes in the requirements for traditional hotel accommodation.

19.74. The availability of hotel rooms in India is extremely limited; it ranks 136th from amongst 139 countries ranked on the basis of the number of hotel rooms. Further, there is acute shortage of land in urban areas particularly in cities due to land market distortions discussed separately in Chapter 4. Therefore, the prospect of large-scale new traditional hotel accommodation is extremely limited. It is imperative to expand the number of registrations under the home stay scheme in various stays so as to significantly augment hotel room capacity in India. This will open up new livelihood opportunities for local people.

HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING

19.75. Tourism is a labour-intensive industry and a major source of employment. Therefore, issues of human resources development and capacity building are extremely important. The problem of human resource is identified as a shortage of trained labour; lack of trainers; inadequate training materials and lack of tourism education strategies as part of national tourism planning. Other issues concerning human resources development in the tourism industry include: working conditions, availability of education and training, policy issues, information and technology and cultural issues.

19.76. Developing human resources in the tourism sector faces unique challenges because customer preferences, travel patterns, information technology and conditions at destinations are changing rapidly. As a result, strong and flexible human resources development strategies are needed. The strategy should mirror human resources needs and the corresponding recruitment, employment and training requirements.

19.77. Training programmes need to articulate well with employment creation, for maximum synergy. Training should be strictly need-based and demand-led. Thus, it is necessary to establish linkages with various labour market institutions and processes:

labour market information, employment services, public works, credit and other support to small enterprises, unemployment and social support services and so on. Training services for existing enterprises to upgrade and re-orient technical skills or develop management capacity can help stimulate their labour absorption, avoid retrenchments and facilitate redeployment of retrenched workers. Therefore, the tourism training strategy should focus on employability, sustainability and promotion of decent work culture especially to safeguard foreign tourists. In the light of the above, the following initiatives need to be undertaken during the Twelfth Plan period to expand the tourism related human resource base:

- a. *Setting up new SIHMs*: Government will need to accord permission to set-up new SIHMs which will also implement the craft courses, short duration skill development courses and skill certification programme.
- b. *Setting up of new Food Crafts Institutes (FCIs)*: Government will need to sanction new FCIs to increase the number of turn-outs with hospitality skills and ensuring sustainable operations.
- c. *Setting up of a Hospitality University*: Presently, an IHM affiliated to the NCHMCT awards a B.Sc. (Hotel and Hospitality Administration) degree of Indira Gandhi National Open University (IGNOU). It is felt that hospitality education course will be pursued as part of the mainstream academic effort only if it is part of a regular University. Accordingly, IHMs will be affiliated to local or Central Universities for awarding a B.Sc. (Hotel and Hospitality Administration).
- d. *Revamping NCHMCT*: Hospitality education, especially at the degree level, needs to be positioned as a mainstream discipline
- e. *Preserving and promoting Indian Cuisine—Setting up of a Indian Culinary Institute (ICI)*: The proposed Indian Culinary Institute (ICI), would be set up with headquarters in the National Capital Region, and six regional centres located in four metropolitan cities, one in Central India and one in the North East. The Institute should be set-up under a PPP mode so that industry expertise from the private sector could be used to build quality and brand value.

- f. *Expansion of Indian Institute of Tourism and Travel Management (IITTM)*: This initiative will include setting up of a North-Eastern Centre of the IITTM; seeking Deemed University/Institute of National Importance status for the IITTM; and developing Simulation Labs at IITTM Centres for hands on training.
- g. *Reorganising the Indian Institute of Skiing and Mountaineering, Gulmarg*: IISM is presently a subordinate office of the MOT. The possibility of its being incorporated in the IITTM as a centre would be explored. The financial assistance for infrastructure upgradation of IISM under the Plan Scheme may also be extended.
- h. *Modifications in the Scheme of Assistance to IHM/FCI*: The Scheme of Assistance to IHMs/FCIs and so on, under the Ministry of Tourism, introduced in 2008, enables the Central Government to establish institutional infrastructure necessary for supporting hospitality and tourism related training and education. Based on the experience, appropriate amendments to the Scheme should be made to enhance its effectiveness and impact.
- i. Expand the scope and size of the *Hunar-se-Rozgar program*.
- j. *Promotion of excellence in institutes*: promotion of research and specialisation in tourism; academic audit of the hospitality institutes; curricula review; faculty development; students' exchange programme; and attached applied training centres/training hotels.
- k. *Merits-cum-scholarships*: Introduce a scheme to provide financial support to meritorious students on merit-cum-means scholarship to encourage students to opt for tourism-related courses.
- a. *Setting up of dedicated teachers' training institutes*: The MOT will set up need based autonomous training institutes catering to the needs of the hospitality and tourism sectors both at skill and diploma/degree levels.
- b. *Designating some IHMs as teachers' training institutes* with need-based infrastructural and faculty strengthening.
- c. *Setting up of Training Institutes in Rural Areas*: In collaboration with Ministry of Rural Development, attempts would be made to explore the possibilities of setting up of training institutes in rural areas to conduct training for forest guards, handicraft workers and so on.

19.78. Market Pulse has estimated a total additional requirement of 77,000 trainers during the Eleventh Plan period. Train-the-trainers strategies can often ensure that a critical mass of experts and experience is made available on a larger scale. A significant positive impact can be created over time on the industry as a whole if a small number of participants are equipped with the skills to train, educate, and service workshops. As of now, there is no dedicated teachers' training institute. Therefore, the following measures are recommended to meet the gap:

19.79. In 2011, Ministry of Tourism commissioned a study by Market Pulse, which estimated a requirement of 36.18 lakh skilled manpower in the hospitality sector. However the Institutional capacities (including the National Skill Development Corporation) created by the end of Eleventh Plan would be able to fulfil only 10 per cent of the estimated additional requirement of manpower in hospitality and tourism sector (inclusive of supply from Non-MOT sources). Thus, there is need to give a major boost to the initiatives through convergence with the other ministries of GOI, States/UT administration and the Private Sector. In governments, it is essential to involve all relevant ministries and agencies, not only in environment but also tourism/economy, education, foreign affairs, planning, regional affairs and finance/budgeting. At times, it may be important to institutionalise these multi-stakeholder and inter-institutional boards by establishing a national committee or council for tourism education and training, so that initiatives can survive beyond short political mandates and/or circumstances. Such a committee or council could be advisory and consultative and should bring together the various ministries; workers' organisations (unions); professional and trade associations (employers), the national association of hotel and tourism schools and all other parts of the tourism sector. Similarly, since almost all tourism employment will be in the private sector, it is crucial that the private sector participates, provides support and resources and gives consultation. The private sector must ensure that it benefits

from national objectives, strategies and policies for human resources development in the tourism industry. Trade associations need to play an important role to encourage the private sector's direct contribution to tourism human resources development.

19.80. With a view to ensuring the successful implementation of the various initiatives relating to human resource development, it is necessary to establish separate institutional structures for developing, implementing, monitoring and evaluating the programmes. For this purpose, it is recommended that:

- a. Separate divisions should be established in the Ministry of Tourism to deal with degree and higher level tourism education *and* skill training programmes.
- b. The institutional infrastructure envisaged in the Twelfth Plan, and the carry over work from the Eleventh Plan, is a means to providing trained manpower to the Industry. Timely completion of the projects sanctioned is, therefore, of paramount importance. A Programme Monitoring Unit (PMU) with adequate staffing should be set-up for projects sanctioned under the Scheme of Assistance to IHMs and so on.
- c. The various initiatives relating to human resource development for the tourism sector will enable the Ministry of Tourism to annually train 2.5 lakh persons for employment in the tourism sector and partially meet the human resource gap.

CAMPAIGN CLEAN INDIA

19.81. A study conducted by MoT at important tourist destinations revealed that cleanliness and hygiene at these places was much below the acceptable level. This not only inconvenienced the tourists, both domestic and foreign, but also had a pull-down impact on image-India. Government should launch a Clean India Campaign by adopting a multi-pronged strategy comprising of persuasion, education, sensitisation, training, demonstration and regulation. The Campaign should involve every strata of the society, the NGOs and the Corporate Sector. For steering and monitoring the Campaign, a dedicated Cell in the MoT should be set up. As a first step, top 50 most

popular monuments and tourist sites may be identified for setting-up pay toilets with separate facilities for women and the physically challenged.

PUBLICITY, PROMOTION AND MARKETING

19.82. In order to promote and market brand India and increase India's share in global tourists' arrival to 1 per cent, it is imperative to adopt a multi-pronged tourism marketing strategy. Some of the important elements of the strategy are discussed below:

- a. *Establish overseas tourism offices/information centres in the target markets*

19.83. Ministry of Tourism should enhance the reach of brand 'Incredible India' and increase inbound tourism from established source markets and new potential markets which increasingly contribute to global traffic like Spain, Russia, South America, and Scandinavian nations, Thailand, Malaysia and Korea and so on. The existing scheme of opening tourist marketing offices of the Ministry of Tourism should be supplemented by appointing 'India Tourism Marketing Representatives (ITMR)'. The ITMRs would be private firms and companies who would represent and undertake required promotional activities in the desired markets in the local language on behalf of the Ministry of Tourism. They will have the necessary market intelligence to work with the local trade in their language on increasing awareness, undertaking publicity and branding, facilitating travel trade, printing of collaterals and so on. The ITMRs will be paid performance related charges for the services rendered by them.

- b. *Produce effective marketing and promotional materials*

19.84. The medium of 'Cinema and TV' is a powerful tool for the development and promotion of destinations. Several destinations have indeed gained by being the venue/location of popular cinema and TV. Ministry of Tourism should extend support for the production of films (international and domestic) showcasing tourism destinations in the country. Details of the scheme for extending such support may be worked out in collaboration with the stakeholders. To further leverage the medium of cinema

and TV, the Ministry may also partner with major cinema and TV-related events.

c. Promote travel festivals

19.85. An annual National Travel Mart under the title 'Global Travel Mart, India' should be organised every year with the main objective of attracting buyers to an event which offers them the entire range of Travel and Tourism products and services in India, in one location. The scope of the fair should include Travel trade. Government should also organise 'India Festivals' in important overseas markets to showcase and promote the tourism destinations, culture, cuisine, handicrafts, textiles and costumes, and so on, of the country. These events should be organised by the Indian tourist industry in collaboration with all the stakeholders but the cost should be borne by the Central and State Governments. Similarly, business meetings may be organised between tour operators from India and the Festivals hosting country.

d. Develop a specialised website for tourism products

19.86. During the Eleventh Plan, there was a greater focus on print, television and outdoor advertising. However, with the growing importance of information technology and internet as a powerful tool for communication, greater emphasis need to be placed on online campaigns, interactive/social media and other modern and innovative technology spheres (for example, i-pad). E-learning online programmes like 'Know India' with video walk-in and multiple languages may be undertaken in overseas markets to educate and equip the tour operators.

e. Arrange more familiarisation trips for travel agencies abroad

19.87. Road Shows should be organised in overseas markets, in collaboration with all stakeholders for promoting tourism destinations, products and tour packages in the country. These Road Shows may include business meetings. Government may also host 'Mega Familiarization Tours' inviting tour operators, travel agents, trade partners and famous travel writers to India to obtain first-hand knowledge of Indian tourism products. Similarly, sub-national governments should be encouraged to organise road

shows in other States/Union Territories to promote their tourist destinations and products.

f. Arrange international meetings in the region where delegates can be exposed to tourist attractions and activities

19.88. International Buddhist Conclave should be organised every two years with the objective of promoting Buddhist circuits and sites in the country. The conclaves may host eminent scholars, tour operators, media and opinion makers from India and abroad. Similarly, conclaves could be held for other religious and cultural groups.

g. Advertorial campaigns to promote and provide information about new and niche tourism products and destinations

19.89. The Incredible India campaigns have been generic in nature and have effectively generated general awareness about India as a tourism destination. The campaigns should be more focused and niche tourism products of the country like Heritage Home Tourism, Religious Tourism, Rural Tourism, Wellness and Medical Tourism, MICE Tourism, Adventure Tourism, Golf, Polo, and so on, should be promoted aggressively through the Campaigns. Specific Road Shows focusing on these Niche Products may also be organised overseas, in association with stakeholders from the relevant fields. The Himalayas and the Sayadhris can be promoted aggressively as destinations for adventure tourism, wildlife and indigenous culture and heritage. Similarly, other physical features of the country need to be exploited.

h. Undertake social awareness campaigns

19.90. The 'Atithidevo Bhava' campaign should be re-enforced to generate wide-spread awareness on issues related to good behaviour towards tourists, civic responsibilities, security and comfort of tourists and so on. It will also help to train local policemen to bring about an attitudinal change towards tourists.

i. Public-Private Co-operation

19.91. Cooperation among public and private sectors is essential in the development of hospitality and tourism marketing mix. The NTO and the private

sector should put more efforts in searching and sharing tourism promotional funds, product development, raising awareness of the destination.

PROMOTING SUSTAINABLE TOURISM

19.92. India provides enormous experiential opportunities for tourists based on the wide variety of all-season attractions available throughout the country. It is imperative that these attractions get developed for the socio-economic benefit of the local communities, especially in order to strengthen inclusive economic growth. It is equally important to ensure that increased socio-economic well-being does not cause permanent or long-term damage to the country's physical, cultural and environmental heritage. The use of existing resources, both tangible and intangible, has to be undertaken judiciously for the well-being of the present generation but not at the cost of depriving future generations of any part of our inheritance. Promoting sustainable tourism will enable the country to take full advantage of the potential of tourism for inclusive growth with livelihoods support to the poor, most disadvantaged, women and youth. Therefore, growth of tourism needs to be sustainable to meet the overall objective of the Twelfth Plan.

19.93. Against this background, it is necessary to define the *Sustainable Tourism Criteria for India (STCI)* and the indicators. The STCI system should be evolved to address the issues relating to the modus operandi of the STCI certification mechanism; incentivising STCI certification; capacity building in industry and the Government; creating governance coefficients using contemporary technology; grievance redressal and review of the certification process.

19.94. STCI needs to be immediately operationalised. In the initial years, the adoption of STCI by individual tourism establishments will have to be voluntary. For implementation of STCI, a system of rating/certification of establishments would have to be evolved. Such a system would need to address key issues like type of rating; incentive for rated/certified establishments; logo for rated/certified establishments; process and institutional mechanism

for certification, validity of certification; audit and capacity building.

19.95. The Working Group on Tourism set-up by the Planning Commission has made a number of recommendations on promotion of sustainable tourism which should be fully implemented. Similarly, the recommendations on eco-tourism, rural tourism and heritage tourism by the Working Group also needs to be implemented to provide an impetus to such form of tourism.

'NICHE' TOURISM PRODUCTS

19.96. During the Eleventh Plan period, the Government took the initiative of identifying, diversifying, developing and promoting the nascent/upcoming 'niche' products of the tourism industry so as to overcome 'seasonality' and promote India as a 365 days destination, attract tourists with specific interests *and* ensure repeat visits for the unique products in which India has comparative advantage. This endeavour of the Government needs to be pursued with greater vigour during the Twelfth Plan period. Some of the 'niche' tourism products identified for development and promotion include Adventure; Meetings Incentives Conferences and Exhibitions (MICE); Cruise; Medical; Wellness; Golf; Polo; Pilgrimage/spiritual travel; Film; Tea/Coffee; Wild Life; and Caravan. Identifying niche products is a dynamic exercise wherein new products may be added in due course. Further, the recommendations on various 'niche' tourism products in Chapter 8 of the Report of the Working Group on Tourism in the Twelfth Plan should be implemented to provide an impetus to 'niche' products.

VERTICAL AND HORIZONTAL CO-ORDINATION

19.97. Tourism is a multi-sectoral activity transcending multiple services provided by a range of suppliers. The related sectors include airlines, surface transport, hotels, basic infrastructure and facilitation systems, external affairs, sanitation, health, internal security and so on. Growth of tourism cannot be attained unless policy and implementation issues across all the sectors are coordinated and addressed simultaneously. For its development,

active involvement of all vertically and horizontally placed agencies is required. Since the tourism projects are implemented at the State/UT level, convergence among various Ministries/Organisations is required at Central and State level.

19.98. At present, there is a lack of horizontal and vertical coordination among the many actors that intervene, directly or indirectly, in the tourism development process. This lack of coordination is observed at the national level, firstly among different government departments that make decisions on tourism related issues, for instance concerning transport infrastructure, or natural protected areas, or education, without considering the implications these decisions may have on the tourism sector. The lack of coordination results in dispersed sector-specific policy orientations and concomitant difficulties in trying to harmonise diverse national, local and sectoral interests. Secondly, there is often a lack of cooperation and coordination between the public institutions concerned with tourism and the traditional tourism private sector for establishing the requirements for tourism investments and operations

19.99. Therefore, it is necessary to establish a mechanism to facilitate horizontal and vertical coordination to optimise tourism induced outcome. In order to achieve this goal, a Tourism Development Authority under the chairmanship of the Prime Minister may be created with multi-sectoral representation from Government (both Centre and States) and other stakeholders to ensure that different interests and viewpoints are considered before a given policy is designed to accomplish national goals and build consensus on differences between stakeholders. The Authority would need to be supported by a Standing Committee.

TAXATION

19.100. Basically, the tourism sector can be taxed either by taxing the businesses in the tourism sector or by taxing the tourists directly. In practice, tourism can be taxed in two ways: through the general tax system, particularly profits and sales taxes, and through special taxes imposed on 'tourist' activities, particularly entry and exit taxes and taxes on

hotels. Most important taxes on tourism in almost every developing country are taxes on hotel services, whether levied as part of a general sales tax or as special 'excise' taxes.

19.101. In general, developing countries do not seem to obtain much revenue from levying income and profits taxes on the tourist industry. In principle, there are no special problems in applying the normal income tax system to the tourist industry. Corporations engaged in providing tourist services should be taxed like any other corporations. The case for any exemption from income tax is extremely weak with the caveat that there should be no bias against the tourism industry under the income tax. Similarly, the individuals they employ and the self-employed tourist operators should be subject to income tax in the same manner as any other employed individual and any other self-employed persons, respectively.

19.102. In countries with general sales taxes, particularly value-added taxes, these taxes are usually extended to hotel accommodation and other tourist activities, although sometimes at reduced rates for competitive reasons. In developing countries, however, as a rule only a limited range of services are subjected to so-called 'general' sales taxes. Instead, special taxes (also referred to as 'tourist' taxes) tend to be applied to such services as those provided by tourist hotels. Since the special taxes applied to tourist services as hotel *accommodation*, *rental cars*, *entertainment* and restaurants may often be intended to approximate to the general level of sales taxation/VAT, they do not, in substance, really constitute industry-specific taxation.

19.103. The most important tourist tax is invariably that on accommodation (and related catering). Hotel accommodation in India is subject to luxury tax by the States at rates ranging from 4 per cent to 20 per cent of the tariff above a threshold limit. With a view to preventing mis-declaration of actual tariff, the levy is imposed on printed tariff with a low threshold limit. Since the actual tariff in lean seasons is substantially lower than the printed tariff, the effective tax rate increases to 30 per cent. Further, the disparity in

the rates of luxury tax across states adds to the dissatisfaction of tourists and compliance cost by tour operators. In addition, the Central Government has, in the Union Budget 2011–12, introduced service tax on the tariff value of hotel accommodation with an abatement of 50 per cent. *Similarly, food and beverages is also subject to State-VAT at varying rates.* VAT on food items range from 5 per cent to 16.84 per cent and on liquor from 13 per cent to 58 per cent. In addition, service tax on air conditioned restaurants has been imposed in the Union Budget 2011–12, with an abatement of 70 per cent.

19.104. Many of the popular tourist circuits require inter-state movements. Tourist coaches/cars moving along inter-state circuits are liable to road and passenger taxes. To illustrate, the golden triangle circuit of Agra-Delhi-Jaipur cover four states of Delhi, Haryana, Uttar Pradesh and Rajasthan. While moving across these states, tourist vehicles are liable to pay road and passenger taxes which varies across states. According to estimates made by Indian Tourist Transport Association (ITTA), for a three day package between Delhi, Agra and Jaipur, the total road and passenger tax paid accounts for 23 per cent of the cost of a three-day package for the Delhi-Agra-Jaipur circuit. In the absence of a centralised tax payment facility, the problem is further aggravated by collection of the tax at each entry/state border. This causes harassment, undue delay in itinerary resulting in dissatisfaction of the tourists and encourages rent seeking behaviour.

19.105. Air travel in India is subject to the multiple levies, thereby undermining the competitiveness of Indian destinations. These are fuel surcharge varying from ₹1,850 to ₹2,500/-; transaction charge varying across sector; new service tax of ₹185/-; passenger service tax; Airport Tax/User development fee which varied from ₹200 to ₹400/- depending on port of departure; Service tax (0.62 per cent of basic fare charged from the travel agents/tour operator services); and Tax on Air Turbine Fuel (ATF) (ranging from 20 per cent to 38 per cent across States).

19.106. Some of the levies are in the nature of user charges and need to be continued. However those in

the nature of taxes are cascading in nature thereby substantially increasing the incidence of tax. Further, there is lack of transparency in collection of these taxes since they vary across airlines. This leads to dissatisfaction amongst the customers.

19.107. The Central Government has introduced a constitutional amendment to enable the introduction of a comprehensive, dual, harmonised and a VAT-type Goods and Services Tax (GST) at the Central and State Government levels. The final contours of the GST regime are under discussion and the new regime is expected to be operationalised from 1 April 2013. The new regime is expected to subsume all Central taxes on goods and services and a number of taxes levied on goods and services at the State level.⁸ The rationalisation of the multiple levies on goods and services consumed in the course of tourism should be consistent with the GST regime. Towards this objective, the tax regime for goods and services relating to the tourism industry should be restructured in the following manner:

- a. The taxes on hotel accommodation, food and beverages levied both by the Centre and the States should be subsumed in the GST. Since GST rates will be uniform across states, the tax incidence will be transparent and reduce compliance burden for tour operators. It will also resolve disputes regarding taxation of self-supply. However, liquor being a 'sin' good, should continue to be subject to a non-vatable type 'excise'.
- b. The goods and passengers tax levied by the States should be subsumed in the GST and the revenue loss may be recouped by suitably adjusting the revenue neutral rate for State GST.
- c. Since the purpose of collecting taxes is to enable the Government to provide public goods like roads, the case for a separate levy like the motor vehicle tax which is in the nature of a user charge for use of roads, is extremely weak. Therefore, Motor vehicles tax/road tax should be subsumed in the GST and the rates adjusted suitable to recoup the revenue loss. The State level registration charges for vehicles should be replaced by an annual Central registration fee for all vehicles

so as to enable them to move unhindered across inter-state borders. It will help establish seamless movement of people across States and eliminate the requirement for tourist permits. The collection from registration charges may be fully devolved to the States in the ratio of their road density.

- d. The aviation sector, like the road transport sector, should be brought under the GST regime and the ATF, fuel surcharge, and service tax should be subsumed. This will ensure that the tax on ATF is fully vatable and therefore do not add to the tax incidence on aviation services.⁹ The other levies like transaction charge, new service tax, airport tax, user development fee, and passenger service tax are in the nature of user charges and therefore may be rationalised to reflect the level and quality of service.
- e. As GST stabilises, consumption of goods and services by foreign tourists should be treated as exports and GST paid by them refunded when they leave the country, in line with best international practice.

VISA FACILITATION

19.108. Smooth and speedy issue of *Visa* is catalytic to the growth of tourism to any destination. The prompt delivery of visas to inbound tourists is one of the key contributors to sustainable development of tourism. As a policy, Ministry of External Affairs is committed to issuing visas within three days of the receipt of an application. However, in practice, there are inordinate delays.

19.109. The Government should, therefore, set-up a High-Powered Committee comprising of officers from the Ministries of Home, External Affairs, Tourism, and Planning Commission and trade representatives to re-engineer the procedure for issuing of visa within 48 hours of receipt of the application, enabling the online filling of visa applications in local language in the non-English speaking countries (especially in Europe); a single window clearance system for conference and medical visa applications *and* extending the facility for issuing visa on Tatkal (emergency) basis on the payment of higher fee as in

the case of passports. Similarly, the fee for Medical Visa needs to be rationalised and the facility of collective landing permit should be introduced.

19.110. Another aspect of visa which needs to be reviewed relates to issuance of Tourist Visa on Arrival (TVOA). An evaluation conducted by Ministry of Tourism shows that the decision to travel to India is significantly influenced by TVOA. Hence, it is necessary to further extend the TVOA facility to European countries (for example, Germany, France, Spain) for which multiple entry visa is allowed; CIS countries like Russia, Kazakhstan, and so on; ASEAN countries—Thailand, Malaysia, Brunei; and other International Airports of the country like Panaji, Bengaluru, Bodh Gaya, Trivandrum, Kochi and Hyderabad. Further, in order to enrich the experience of tourists with the TVOA facility, immigration Officials dealing with TVOA facility need to be trained to create an awareness of the tourism industry among the immigration officers.

19.111. A number of grievances arising from implementation of the visa system can be resolved through inter-ministerial coordination. A permanent task force of Joint Secretary level officers from Ministries of Tourism, Home and External Affairs may be formed under the chairmanship of Joint Secretary from Ministry of Home Affairs to expeditiously resolve visa related problems brought to their notice.

SAFETY AND SECURITY

19.112. Safety and the security of the tourists is a worldwide concern. Any adverse perception about safety and security of the tourists has serious implications for tourist arrivals to the country and its tourist destinations. Accordingly, based on experience, the scheme for constitution of Tourist Facilitation and Security Organization(s) (TFSOs) in States/UTs employing ex-servicemen introduced during the Eleventh Plan may be extended during the Twelfth Plan. Similarly, the Government should undertake awareness campaigns for spreading a message for adoption of Code of Conduct for 'Safe and Honourable Tourism' among the stakeholders, service providers and State level Tourism Departments. The Code is a set of guidelines primarily intended to

encourage tourism activities to be undertaken without compromising the basic rights like dignity, safety and freedom from exploitation of both tourists and local residents, in particular, women and children.

MARKET RESEARCH AND TOURISM STATISTICS

19.113. Tourism statistics are extremely vital for policy formulation on demand and supply of tourism services at national, regional and local levels. The key tourism statistics which need to be compiled on a regular basis should relate to visitor arrival information; tourism expenditure estimates; visitor surveys (expenditure, motivation, satisfaction and so on); accommodation and tourism establishment surveys and tourism satellite account (TSA). Effort should be to establish an internationally consistent system of tourism statistics and harmonise the method and conceptual basis of collection, collation and dissemination of tourism related information at all levels in the country. In this regard, the recommendations made by the Working Group on Tourism should be fully implemented.

CONCLUSION

19.114. Tourism has the potential to help achieve the objectives of the Twelfth Plan for faster, more inclusive, and sustainable growth. More importantly, it is a powerful antidote to poverty. It eliminates the disadvantage of market inaccessibility suffered by the poor in respect of their goods and services by bringing the consumer to their doorstep. This reduces the need for intermediation thereby improving recovery. However, the potential can be fully realised only if the international competitiveness of the Indian tourism sector improves significantly by removing both the supply and demand constraints.

19.115. India has a large domestic tourism market too, in addition to international travellers. A variety of products and price points required to realise the country's large domestic tourism potential must be developed. Standard, international products will not be able to open up this market. Indeed even foreign tourists to India come for a variety of experiences, from the luxurious to the simple and spiritual. This would require innovations in products. Therefore, on the supply side, it is necessary to identify new

tourism products and create destinations and circuits around them through a comprehensive physical and financial plan through a community participatory process. This would have to be complemented by building the necessary human resource skills for servicing the tourist. Similarly, on the demand side, a multi-pronged effective tourism marketing strategy would need to be adopted to eliminate information asymmetry and create brand India. Since pricing is an important determinant in the choice of an international destination, the tourists cannot be excessively burdened with statutory levies and taxes. Therefore, taxation of tourism should be rationalised in conformity with best international practice.

19.116. The responsibilities for implementing the comprehensive plan for development of tourist circuits and building brand India is fragmented vertically across levels of governments and horizontally across the private and public sector. Hence, it is imperative to establish a transparent and effective policy and regulatory framework; create the appropriate incentive structure; and institute a coordination mechanism to synergise the activities of different stakeholders.

19.117. The Gross Budgetary Support for the Twelfth Five Year Plan (2012–17) for the Ministry of Tourism is ₹15,190 crores that excludes IEBR of 155 crore.

ARTS AND CULTURE

19.118. India has a long, rich and diverse cultural heritage that is deeply rooted in its pluralistic ethos providing a creative expression to thousands of communities that make contemporary Indian society. The expression of this rich cultural tradition by individuals and groups not only creates a vibrant society but also provides livelihood to a large section of people contributing to the country's economy. With its rich cultural tradition, India occupies an important place on the cultural map of the world. This is also an expression of its 'soft power'. A variety of cultural traditions and diverse historical legacies of different regions join together to provide India its unique identity as a 'nation state'. Thus, culture should not be seen as a mere 'fringe' activity, but is now at the

‘core’ of the holistic development strategy of the country and its people.

19.119. The Government through its network of institutions and a slew of grants-in-aid schemes has been supporting preservation, popularisation and promotion of the rich cultural heritage of the country. Different activities create a link between the past and present and lay the foundation for future development of the country’s tangible and intangible cultural heritage. This is done through museums, archives, libraries, the performing arts and so on and by organising a variety of events and festivals. Government efforts create an environment and sensitivity for sustenance of the country’s cultural heritage and promotion of cultural activities in all its variety. Thus, activities and institutions under the Ministry of Culture are important pillars for inclusive development of the country.

STRATEGIC SHIFT IN THE TWELFTH PLAN

19.120. During the Twelfth Plan, we need to adopt a new approach and appropriate policies which are less dependent on Government financing and catalyse local partnerships. The programmes must be integrated into strategies for sustainable development at every level and take into account the needs and aspirations of the community where cultural assets are found. Sustainable heritage conservation depends upon the commitment and involvement of local communities. Conservation policies, to be successful, need to promote local community stewardship of the heritage as well as provide socio-economic benefits for local communities. Therefore, a direct link must be made between safeguarding the heritage and socio-economic development. This calls for the deliberate recasting of heritage conservation as a development activity that brings economic opportunities, creates jobs, and generates income based on traditional technologies and knowhow. This new programme is aimed at complementing and extending those efforts by moving heritage conservation beyond the exclusive sphere of high technology and elite specialisation and to become the concern and responsibility of every citizen and transform heritage conservation into a grassroots movement which will return the heritage to the communities that created it

and who rely on it as the foundation for their future development.

19.121. While ongoing professional and institutional efforts at heritage conservation would be strengthened, participatory approach would be used to catalyse engagement of local community and various interest groups. They would assess the unique characteristics, strengths and economic potential of the elements making up their physical as well as intangible cultural heritage, and then design a community action plan to self-develop these elements in a way which is both profitable and sustainable. Through the programme assistance should be provided in the form of practical, technical, and small “start-up” grants to the local communities and NGOs. At least some part of the annual plan outlay for culture should be used for these “local” grants.

TANGIBLE CULTURAL HERITAGE

19.122. The Archaeological Survey of India (ASI) would be strengthened during the Twelfth Plan for proper conservation, preservation and maintenance of the built heritage of the country. For this, it would be necessary to prepare a comprehensive coordinated plan for conservation and development of monuments and archaeological sites by the Central and State governments and academic and research institutions. They could also be involved in archaeological exploration and excavation. UNESCO Category-2 Regional Centres would be established. Efforts would be stepped up for conservation of unprotected heritage buildings, monuments, archaeological sites, and historic buildings. Fellowships for visiting scholars would be instituted. Cultural Heritage Management Council would be created. And, finally, mapping of cultural heritage resources would be taken up. Schools would be engaged in mapping of local history, ecology and cultural heritage of the area where they are located.

19.123. Museums play an important role in society. They preserve and promote art, culture and scientific learning. They are the learning centres for children during their formative years. They help in building public awareness of the wealth of the nation as well

as scientific temper in the population. Compared to its size and vast heritage, the country has a small number of museums and these are not all properly managed. There is a need to set up modern museums of arts and science all over the country that use advanced technology to showcase Indian art, culture and science (including science cities and science centres) as used in day-to-day life. The museums should be interactive and help in learning. These should provide an experience for children and public at large and should also provide information in the local and regional languages. A large number of Science museums in partnership with the Ministry of Science and Technology and Ministry of HRD also be established. These could have three parts—pedagogy centre for school/college teachers, science activity centre for students, and science Exploratorium for general public.

19.124. During the Eleventh Plan, various measures were taken for up-gradation/modernisation, and improvement in functioning, of the national-level museums directly funded by the Government of India and a large number of local-level museums run by State Governments, trusts, foundations and so on. Academic and research institutions should be supported to set up more museums across the country. These measures have helped in furthering the cause of the ‘museum movement’ and the pace of modernisation should be accelerated during the Twelfth Plan period. For this purpose, it is imperative to adopt a multi-pronged strategy comprising the provision of financial assistance for establishment and up-gradation of local and regional museums through the revision of the existing scheme; modernising of State and national level museums; establishing larger scale museums in State capitals through partnership with State Governments/Civil Society; digitisation of collections in all museums to facilitate accessibility through a virtual museum portals including 3D exhibits and virtual 3D tours; making museum websites more dynamic, interactive and social-media enabled to attract online participation; creation of innovation spaces in museums based on framework provided by the National Innovation Council and capacity building and training of existing staff

of Museums. Role of museums in education, informal as well as formal learning aligned to curriculum would be strengthened in the Twelfth Plan.

INTANGIBLE CULTURAL HERITAGE

19.125. At present, Anthropological Survey of India (AnSI) is involved in collaborating scientific work relating to anthropology with scientific institutions. However, there is no scheme for providing financial assistance for such scientific work. Therefore, a mechanism should be established to enable AnSI to provide financial assistance to projects proposed by the scientific organisations of State Governments, departments of anthropology in universities, NGOs involved in anthropological studies and similar bodies. Further, assistance to State Governments, institutions and organisations should also be provided for documentation and dissemination of research results in the field of anthropology.

19.126. A large amount of cultural wealth is stored in the form of audio-visual materials available with various government and non-governmental institutions and private individuals. In the absence of a systematic organisation and periodic up-gradation, these materials are fast deteriorating. To digitise them and to provide the wider public an easy access to these and to the new audio-visual resources being constantly generated, appropriate technological and institutional framework is urgently required.

19.127. For this purpose, a separate National Audio-Visual Archives (NAVA) should be established as a virtual network of cultural resources in audio-visual form. NAVA will be engaged in instituting state-of-the-art digitisation and storage system for independent repositories of audio-visual resources; setting up a virtual network of these repositories and offering interactive online access to their resources; and standardising and periodically upgrading the methods and technologies used in production, storage and retrieval of audio-visual resources. The design of data-retrieval systems, being the point-of-access for users of the database, must be given adequate attention and must provide for relevant interactive tools to be used. The genres to be covered will include

oral traditions, traditional crafts and textiles, dance, music and theatrical practices, cultural practices and traditional knowledge.

19.128. Dissemination of India's traditional and contemporary cultural expressions is an important means for preservation of culture. For this, high quality programmes on art and culture could be supported. Such programmes may be telecast on all public and private channels. All this video content could also be made available in the public domain. Competitions can be launched inviting short films, documentaries and short videos on specified themes to capture the cultural diversity and expressions across the country.

19.129. Unlike most capital cities of the world, Delhi does not have a world class integrated infrastructural facility for culture and performing arts. This gap needs to be filled up by setting up a National Centre of Performing Arts at New Delhi. The Centre will be a state-of-the-art "cultural multiplex" housing a set of auditoria/performance spaces of varying sizes and specifications and present, round the year, world class productions of India's varied arts from across the country. It will also develop its own repertoire and be a vibrant cultural hub. This would require about 15–20 acre land in Central Delhi. Similar centres may also be set-up in Kolkata, Chennai and other major cities in due course. In Kolkata, the area encompassing Rabindra Sadan Cultural Complex and Central Cultural Institute has a potential to be developed into such a Centre. New and innovative institutional arrangements and partnerships may be needed to create and manage such integrated complexes.

19.130. National School of Drama (NSD) has emerged as a foremost theatre training institution in the world and the only one of its kind in India. It has played an important role in shaping contemporary theatre in all its variety in the country. Need for more such schools were recognised in the Eleventh Plan. During the Twelfth Plan, five Regional Schools of Drama at Bengaluru, Kolkata, Maharashtra/Goa, J&K, and the North-East region will be set up by the Ministry of Culture as independent, autonomous

Schools of Drama having their own repertory companies. These Schools will be free to draw upon the experience of NSD, New Delhi and grow on their own. In addition, the States will be encouraged to set-up their own language-based versions of NSD.

KNOWLEDGE RESOURCE HERITAGE

19.131. During the Twelfth Plan, public library system in the country should be rejuvenated by taking advantage of the technological developments that have transformative potential to change the public libraries. Existing public libraries must modernise their collections, services and facilities and become pro-active in resource sharing, professional development of staff, extending library facilities right up to the grassroots through the Panchayats. Based on the recommendation of the National Knowledge Commission, a National Mission on Libraries has already been established. The mission should now be enabled to undertake specific activities as per NKC recommendations and could pave way for setting up of an independent and financially autonomous National Commission on Libraries.

19.132. Archival system including National Archives would also be strengthened. The process of acquisition and accession of public and private records at the National Archives of India would be stepped up. Digitisation and security microfilm making would also be done expeditiously. Old public institutions including academic and research institutions and private archives should be supported to conserve, preserve, digitise and archive valuable Indian heritage.

19.133. India has unique and unparalleled living and diverse cultural traditions of an unimaginable magnitude. To provide sustenance to, and showcase the richness of living and diverse cultural traditions of India, an overarching mechanism in the form of a National Network Centre on India's Intangible Cultural Heritage should be set up for mapping and documenting India's valuable tangible and intangible cultural assets in different eco-cultural zones. It should provide for coordinated identification, documentation and preservation of the extensive and diverse range of India's traditional knowledge system and integrate

its various dimensions. For this purpose, Government may seek international technical assistance for designing a system based on best international practice.

19.134. Ideas, ideals and values promoted by Mahatma Gandhi have become more relevant today than before—not only for India but for the entire world. Thus, a Gandhi Heritage Mission would be taken up to conserve, preserve and promote Gandhi's physical and the intellectual heritage. Further, his ideas and values would be promoted across the world through conference and seminars on Gandhi's intellectual heritage.

19.135. Indian writing is unique in its pluralistic, multilingual traditions and has an incredible heritage of rich literary diversity. During the Eleventh Plan, the Government had initiated a pilot project, 'Indian Literature Abroad', to promote and showcase Indian literature to a larger international audience. This was meant to support and facilitate translation and promotion of literary heritage and contemporary literature of various Indian languages into major foreign languages. This project has been widely appreciated and would be continued during the Twelfth Plan.

EDUCATION, RESEARCH AND INTERNATIONAL CULTURAL RELATIONS

19.136. The existing schemes under the Education and Research Section should be modified to be more effective. With a view to preserving and promoting Buddhist Culture the setting up of Bodh Darshan Higher Study School, Tabo (Himachal Pradesh) will get priority during the Twelfth Plan period. Similarly, the existing schemes for promoting international cultural relations need to be rationalised to effectively foster friendly relations and project Indian culture in the countries concerned.

19.137. Further, it is also necessary to put in place a mechanism for providing financial assistance for artists and cultural professionals going abroad for seminars, festivals and exhibitions on cultural subjects and for providing financial assistance to foreign artists desiring to study and/or learn Indian culture in any form like dance, music and drama for

supporting Indian artistes to go abroad or foreign artistes to take up study in the field of Indian culture. This assistance does not have to be entirely through Government support, but should bring together private donors and corporate entities. The Government should provide matching grants.

19.138. During the Twelfth Plan, India should explore the possibility of having a permanent presence at the prestigious Venice Biennale of Art. The space could be used not only for the Art Biennale but also for the equally prestigious Venice Biennale of Architecture and in the lean months for any other cultural activities.

GOVERNANCE AND PARTNERSHIPS

19.139. India's traditional and contemporary cultural expressions are extremely diverse and spread out and therefore no centralised academy or agency can do full justice with the demands of the sector. For various reasons, many of the State Academies set up by various State Governments are in disarray. Central Government needs to partner with the State Governments in making the State Academies play an important role in preserving and promoting performing, visual and literary arts of each State. For this purposes, Ministry of Culture will introduce scheme for rejuvenating both central and the State Academies working in the field of performing, visual and literary arts by providing financial assistance subject to professionalisation of the management of these bodies.

19.140. In order to leverage professional expertise and capacity from outside in specific disciplines, Government could enter into partnership with selected universities, institutions of national importance, research institutions and cultural organisations to undertake a mutually agreed programme and function as Centre of Excellence in the specified fields. While autonomy of these organisations will be respected, deliverables will be closely monitored. This partnership could be with well-established theatre groups and professional repertory companies with high standard of excellence, cultural research centres and repositories of archives on a particular subject, and centres of excellence in cultural texts,

stagecraft, cross translations, interactive documentation, teaching and learning of traditional arts, conservation and preservation of both tangible and intangible heritage of the country.

19.141. Ministry of Culture and its autonomous organisations have a large number of grants-in-aid schemes meant to provide financial support to individuals and organisations in the area of culture. Several steps like electronic payments, online applications and minutes of expert committees available online have been introduced to bring about transparency. During the Twelfth Plan, greater objectivity and transparency would be infused by developing a comprehensive management information system with online filing and tracking of all applications and IT solutions for back-end operations in a seamless manner.

19.142. Capacity-building and training of personnel to work in various Cultural Organisations is a critical requirement. Presently, some training is being imparted, but in a limited and distributed manner with various institutes under the aegis of the Government. Coordination and expansion of training research should be undertaken through an apex institutional mechanism or a Central Cultural University for the purpose.

CONCLUSION

19.143. The conservation of culture is extremely vital for inclusive growth. In general, cultural assets are owned by the relatively poorer section of the society. Any erosion in these assets will further aggravate the asset ownership pattern to the detriment of the poor. The problem is further aggravated by the fact that often these assets are also income generating. These assets cannot be protected by individuals and therefore Government must step in to provide technical and financial support. Such efforts should essentially complement the new programme for conservation, which should usher a paradigm shift in our hitherto conservation efforts, by integrating it into the overall development strategy for local communities.

19.144. The Plan allocation for the Twelfth Five Year Plan (2012–17) for Ministry of Culture is ₹7,275 crores.

HANDLOOMS AND HANDICRAFTS

INTRODUCTION

19.145. The handloom and handicrafts sectors have their roots in the rich traditional, historical and cultural diversity that distinguishes India from the rest of the world. The two sectors are also particularly significant as they provide low-cost and green livelihood opportunities to lakhs of families, besides supplementing incomes in times of agrarian distress, checking migration and preserving the traditional economic relationships between different sections of the society. As on June 2011, the handloom and handicraft sectors employed 43.32 lakh weavers/workers and 68.86 lakh craftspersons respectively, resulting in total employment of 112.18 lakh persons. With women contributing a majority (85 per cent) of the pre- and post-loom labour and accounting for over 50 per cent of weavers/artisans in the country, and a significant mass of weavers/artisans consisting of Scheduled Castes (SCs), Scheduled Tribes (STs), other backward classes (OBCs) and religious minorities, these two sectors also represent the economic lifeline of the most vulnerable sections of the population. Owing to their cultural and economic importance in India's development process, various policies along with programmatic interventions, are proposed to be implemented in the Twelfth Plan, aimed at generating sustained and productive employment with suitable working conditions for the entire weaver, artisanal and ancillary worker population, and also to ensure that the crafts and their products continue to flourish across the country as well as abroad.

HANDLOOMS

19.146. Indian handlooms are characterised by an infinite variety of weaves, textures and designs spun on the handloom, ranging from the finest muslins to heavy bedspreads, from delicate pastels to earthy hues, and from appealingly simple to amazingly intricate compositions, which are known throughout the world since ancient times. This sector can meet every need, from exquisite fabrics, which take months to weave, to popular items of mass production for daily use. Handloom, being a State subject, its development is primarily the responsibility of

the State Governments. However, the Government of India has been supplementing the efforts of the States with its policy of promoting and encouraging the sector through suitable interventions.

Current Situation

19.147. As per the latest (3rd) Handloom Census of 2009–10, there are 23.77 lakh handlooms in the country, providing employment to 43.32 lakh handloom weavers and ancillary workers which include 38.47 lakh adult handloom weavers and ancillary workers. Of the latter, 77.90 per cent are women, 10.13 per cent belong to the SCs, 18.12 per cent to the STs and 45.18 per cent to OBCs. A total of 27.83 lakh handloom households are engaged in weaving and allied activities, of which 87 per cent are located in rural areas and remaining 13 per cent in urban areas. Most of the handloom households live in kutcha (54 per cent) or semi-pucca (31 per cent) houses; only 15 per cent households live in pucca houses. However, 53 per cent of the handloom households weave only for commercial purposes, and nearly 16 per cent households undertake a mix of domestic and commercial production. In the North Eastern Region (NER), 90 per cent of handloom worker households are weaver households and account for 63.4 per cent of total handloom worker households in the country. The Approach Paper for the Twelfth Plan has identified handlooms as one of the priority sectors that will create large scale employment opportunities.

19.148. The performance of the handloom sector during the Eleventh Plan period is indicated in Table 19.5 which shows that total handloom cloth

production was 6,947 million square meters during the first year of the Eleventh Plan (2007–08), but it declined by 3.89 per cent in the following year (2008–09) which was marked by global recession. However, since then, production has consistently risen in the third and fourth years of the Eleventh Plan, to reach a production level of 6,930 million square meters during 2011–12, which accounts for over 14 per cent of total cloth/textile production, comprising handloom, mill-made and powerloom, in the country. Exports rose by 26 per cent in 2010–11 to ₹1,574.95 crore as compared to the previous year and further to ₹2,653.95 crore, registering a growth of 68 per cent over the previous year.

Challenges for the Twelfth Plan for Handlooms

19.149. While considerable progress has been made in the handloom sector during the Eleventh Plan as depicted in Table 19.5, a lot still remains to be done as the sector continues to face several daunting challenges and uncertainties.

Welfare and Livelihood of Weavers

19.150. Nearly 47 per cent of all handloom weavers belong to BPL families and 10 per cent fall in the Antodaya Anna Yojana (AAY) category. About 29.4 per cent of all handloom workers have never attended school and 12.7 per cent are educated only up to the primary school level. Poverty and illiteracy among weaver families is accompanied by poor access to basic necessities including health, water, sanitation, housing and livelihood facilities. The contribution of women is largely unacknowledged, although women constitute nearly 70 per cent of total handloom weavers/workers.

TABLE 19.5
Performance of Handloom Sector during the Eleventh Plan Period

Item	2007–08	2008–09	2009–10	2010–11	2011–12	CAGR (%)
Cloth Production (million square meters)	6,947	6,677	6,806	6,903	6,930 (Prov.)	1.25 (base: '08-'09)
Employment (lakh persons)	NA	NA	43.32	43.32	43.32	–
Export (₹crore)	NA*	NA*	1,252.81	1,574.95	2,653.95	45.55

Source: Office of Development Commissioner (Handlooms), Ministry of Textiles.

Note: *Not available due to absence of ITC (HS) codes for handloom products.

Rising Input Costs

19.151. Despite more than 700 yarn depots being operated, the issue of easy sourcing of raw materials, both yarn and dyes and chemicals, at reasonable prices has been a key problem across centres of handloom production, particularly in the NER, as in recent period, there has been a sharp rise in yarn prices. The problem is more acute for individual weavers who need smaller quantities of yarn which are not readily available.

Sparse Credit Coverage and High Cost

19.152. Weavers are prone to diverting credit towards consumption needs, and lack of even rudimentary financial literacy aggravates the existing credit-related obstacles faced by them. Further, a majority of the weavers continue to operate outside the fold of institutionalised financing, with nearly 44.6 per cent being dependent on Master Weavers, 13.4 per cent on moneylenders and only 14.8 per cent having access to institutionalised sources of credit. For rural households, access to institutional financing was far lower at 7.7 per cent revealing the extent to which weavers are trapped in the vicious cycle of debt and resultant poverty.

Marketing Bottlenecks and Lack of Opportunities

19.153. Dearth of innovation and limited dynamism in the handloom sector, particularly in the field of marketing, is a matter of concern, which is impeding its expansion and growth. As 61.1 per cent of the total weaver workforce (24 per cent for non-North Eastern States) comprise of independent workers, a majority of the weavers necessarily bear all the risks associated with the business of procurement, marketing and sale, with obvious consequences. Certain State Governments have undertaken innovative measures to popularise the use of handloom products (Box 19.2). Such innovative measures for promoting handloom products need to be replicated by other States.

Poor Institutional Coverage and Management

19.154. About 85 per cent of weavers are outside the cooperative fold, as they either work under Master Weavers/traders or independently. Further, several Apex/Handloom Corporations have become

dormant due to a host of reasons such as financial losses, lack of professional management, over-staffing and poor marketing and distribution channels, which have, in turn, affected the health of about 50 per cent of the Primary Weavers' Cooperative Societies.

Poor Policy Dissemination and Information Gaps

19.155. Lack of information to weavers regarding various Government policies/schemes under implementation, is a significant cause for deteriorating conditions of the weavers. Sometimes even the implementing agencies may not possess complete information, resulting in critical gaps in implementation. Also, major institutions providing critical inputs like credit, research, technology, management, and market development, are largely centralised and hence unable to reach the dispersed and largely home-based weavers.

Infrastructure Gaps

19.156. Infrastructure in the handloom sector continues to be inadequate, with substantial gaps, particularly in the NER. Facilities such as clean drinking water, sanitation, effluent treatment plants and electricity, are yet to be universally provided in all hubs of handloom production. Systems that ensure efficient supply chain management from the stage of availability of raw materials up to sale of finished goods are yet to be set up.

Monitoring and Evaluation

19.157. There is a need for a strong Web-based monitoring and evaluation system to promote transparency and accountability and facilitate regular tracking of physical and financial performance of individual programmes/projects, particularly the ongoing clusters.

Education, Skills, Research and Training

19.158. The formal education system, including research institutes, has not included teaching, training and skill development for handlooms into its mainstream curricula. Hence, the onus of introducing innovation in design and techniques, and passing the traditions to younger generations, is left to

Box 19.2 Popular Choice by Design!

- The Jharkand Silk, Textile and Handicraft Development Corporation (Jharcraft) has adopted an innovative method to implement the weavers' credit card scheme, involving a tripartite agreement between the weaver, Jharcraft and Dena Bank, under which three different accounts are maintained by the Bank—savings account of weaver, loan account of weaver and Jharcraft's account. The price of raw material issued to the weaver is deducted from loan account of the weaver and deposited into Jharcraft's account. When the latter gets the finished product, weaver's dues are credited into savings account of weaver. After the finished product is sold, the sale proceeds are deposited into the loan account of the weaver. In view of the success of this pilot, it is now being scaled up by the State. Jharcraft has also, after making sustained efforts, revived two unique tribal paint forms—Jadapatia of Dumka and Pyathar of Singhbhum which had almost become extinct. Under a project named 'HARSH', more than 50,000 Self-Help Groups have been organised, mainly consisting of women. In addition, bamboo-based low cost houses and toilets are being developed for weavers and artisans. Jharcraft is now operating 25 emporia across the country, with its initiatives having resulted in an incredible jump in turnover from ₹50 lakh in 2007–08 to ₹70 crore in 2011–12!
- For creating sustainable jobs for weavers/artisans, upgrading skills/product quality, raising earnings and creating market linkages, Government of Odisha has signed an MOU with a subsidiary of Fabindia under which a Community Owned Company was set up in October 2010. In 2011–12, the Company has inducted 300 artisans as shareholders; total sale of products during this period was ₹1.4 crore; another project by Boyanika (Orissa State Handloom Weavers' Cooperative Society) is aimed at improving designs and creating a market for the State's handloom and textile products; leading designers such as Rta Kapur Chishti, Bibhu Mohapatra, Rajesh Pratap Singh, and Rakesh Thakore are associated with it.
- Lepakshi of Andhra Pradesh has launched a major ICT initiative through a web-based service for online sale of craft items produced in the State. Now, markets are just a click away, besides keeping the intermediaries away!
- In Madhya Pradesh, handloom angvastrams/stoles are, inter alia, presented to dignitaries and guests at State functions, providing visibility to the products both domestically and internationally, besides creating a growing, captive market for such products. Presentation of 'Chanderi' angvastrams was a major highlight at the Commonwealth Games!

weaver families who usually have no resources to devote to this critical field.

Limited Role of Private Enterprise

19.159. The success of project interventions is limited by the capacity of NGOs/implementing agencies which often have weak linkages with the market, thereby limiting the sustainability of their operations. Also, implementing agencies are often unable to sustain operations after funding support under the concerned Schemes has stopped. Greater private participation for promoting professional management and handholding support, inter alia, through adoption of the PPP model, is required to supplement Government resources and bring about greater efficiencies and ensure attainment of project targets.

Consolidation

19.160. The existing clusters need consolidation for converting the Self-Help Groups (SHGs) into self-sustainable community-based enterprises. Hence, adequate measures are necessary to ensure

consolidation of all existing clusters introduced in the earlier Plans. At the same time, for equitable growth of the sector, the remaining clusters/areas also need coverage in a phased manner. As such, cluster development needs to be given continued emphasis for achieving integrated and holistic development of the weavers. Consolidation of all efforts introduced in the earlier Plans is a big challenge for the Twelfth Plan.

The Vision and Strategies for the Twelfth Plan for Handlooms

19.161. The vision for the handloom sector for the Twelfth Plan is to develop a strong, competitive and vibrant sector in order to provide sustainable employment to the weavers and ancillary workers, particularly belonging to the disadvantaged sections of the population and to ensure faster, more inclusive growth of the sector. To achieve the vision, the emphasis in the Twelfth Plan will be on consolidation of past gains and strengthening of marketing systems. Effort will continue over the next five years to promote supply of yarn/dyes and chemicals in

smaller quantities/sachets and allocation of more depots; achieving universal financial inclusion of weavers/ancillary workers with margin money and credit guarantee support, interest subvention, greater coverage of Weaver Credit Cards and linking SHGs with banks, Microfinance Institutions (MFIs) and others for greater access to credit; expanding coverage under weaver welfare programmes; restructuring the cluster development approach for more efficient management and increased sustainability of existing clusters and taking up new clusters where none have been assisted so far; broadening the eligibility of implementing agencies to include NGOs, associations, design institutes, management institutes and other institutions of repute which have local and regional experience and relevant expertise; enumerating women's contribution in mapping/diagnostic exercises; and establishing robust monitoring and evaluation systems, along with defined goalposts.

19.162. The Twelfth Plan will also encourage greater environmental compliance and occupational health and safety by adoption of measures such as quantifying environmental impact in planning for cluster development, mandatorily installing effluent treatment plant (ETP) in all the dyeing units in PPP mode, promoting solar lighting and supporting adoption of improved looms with better ergonomics to reduce drudgery of weavers. To overcome the exiting training and skill gaps, the Weavers' Service Centres (WSCs) and Indian Institutes of Handloom Technology (IIHTs) will be strengthened and further consolidated. Formal crafts education will be introduced through establishment of Textiles chairs in leading regional and national universities to inspire and draw young people into joining the sector. A Textile Museum/Observatory/Resource centre/Hastkala Academy to support preservation, revival, archiving and documentation of languishing handloom crafts (including handicrafts) will also be set up under PPP. Design and product diversity, including development of niche products will be directed towards strengthening marketing and brand building. The brand of 'Handmade in India' will be promoted domestically as well as abroad, and since the handlooms, handicrafts, and khadi and the village industry sectors are distinct but have threads of

commonality, greater synergy will be encouraged between them to achieve more efficient utilisation of resources. The coverage of 'Handloom Mark' is proposed to be enlarged to cover all handloom products within a definite time frame. States will be encouraged to leverage the rich tradition of the handloom sector to develop tourism potential by showcasing the unique skills/products by setting up permanent establishments where live demonstration of the crafts along with sales counters could be provided for, at strategic locations, which could serve as captive marketing channels for weavers. To boost exports, besides participation in fairs and exhibitions abroad, 'India Weaves Week' will be organised at the Indian Embassies/High Commissions.

19.163. Special Assistance to NER will be extended through focus on up gradation of looms, dye houses and work-sheds after in-depth evaluation and review of existing infrastructure. SHGs will be formed and training facilities upgraded to arrive at 100 per cent coverage of handloom workers. An Apparel Designing and Training Institute is proposed to be set up, linked with one Special Weavers' Service Centre. A new umbrella scheme that gives space for framing projects for NER within the objectives for the handloom sector with flexibilities in guidelines to suit their peculiar difficulties is proposed. One of the projects within the scheme would be conversion of domestic handloom units into Minimum Economic Size (MES) commercial units aimed at creating commercial areas with infrastructure including work-sheds, equipment and common facility centres for making the handloom industry in NER more market responsive and professionally oriented.

19.164. Major interventions proposed for the handloom sector during the Twelfth Plan are given in Box 19.3.

HANDICRAFTS

19.165. Handicrafts are items made by hand with the use of simple tools, generally artistic and/or traditional in nature, which are used for decorative purposes, including as gifts and souvenirs as well as for utility purposes. Handicrafts activity is predominantly carried out in the unorganised household

Box 19.3 Twelfth Plan Interventions for Handlooms

Marketing, Exports, Brand Building and Promotion of Handloom Products—Marketing Events; Urban Haats; Retail Outlets; Strengthening of Handloom Organisations; Marketing Incentive Component; International Fairs and Exhibitions; and Export Projects.

Infrastructure and Cluster Model—Consolidation of existing Clusters; New Clusters/Projects; Will include Group Projects/State-specific Projects and Innovative ideas; New component of Margin Money support.

Raw Material Availability—Yarn to be supplied, including supplies under 10 per cent Hank Yarn Price Subsidy and increased freight/depot charges for NE States; Depots to take up distribution of dyes and chemicals also; Depot-cum-Warehouse for supply of smaller quantities of yarn.

Credit Availability—Credit Guarantee and Interest Subvention to weavers against targeted credit.

Social Welfare Measures/Environmental Compliance—Health Insurance Scheme and Mahatma Gandhi Bunkar Bima Yojana; Environmental Compliance Projects; Solar lighting; Looms improvement and better ergonomics.

Training, HRD, R&D and Technical Processes—Improvement in infrastructure and machinery in existing WSCs and IIHTs; Introduction of degree courses; R&D Projects; Revival and documentation of languishing handloom crafts.

North Eastern Region—Umbrella scheme for greater flexibility; conversion of domestic handloom units into Minimum Economic Size (MES) commercial units

sector, and in India as well as in many other regions of the world, the handicrafts sector is identified as the largest sector of rural employment after agriculture. As in the case of handlooms, the handicrafts industry has also been identified in the Approach Paper for the Twelfth Plan as one of the priority sectors that will create large-scale employment opportunities.

Current Situation

19.166. The Handicrafts Census is yet to be completed, which will indicate the precise extent and nature of the sector. As per latest available estimates, employment in this sector has risen from 47.61 lakh in 2005–06 to 68.86 lakh crafts persons in 2010–11; 20.80 per cent belong to the SCs, 7.50 per cent to the STs, 52.40 per cent to OBCs and 56.0 per cent are women. It is proposed to include Handicrafts in the Sixth Economic Census scheduled to be conducted during 2012–13.

19.167. The performance of the handicrafts sector during the Eleventh Plan period is given in Table 19.6. It is to be noted that towards the beginning of the Eleventh Plan, exports of handicrafts (inclusive of carpets) suffered a severe setback due to the global economic recession in 2008. Thus, exports declined by 37.89 per cent in the second year of the Eleventh

Plan (2008–09) to ₹10,891.85 crore. However, steps taken by the Government led to total handicraft exports increasing by 3.05 per cent in 2009–10, followed by a 20.51 per cent increase during 2010–11 and further by 24.58 per cent during the last year (2011–12) of the Eleventh Plan, to reach a level of ₹16,851.27 crore. The revival of the industry has now led to the return of many artisans who had left the sector earlier. However, India's share in total world handicrafts exports is estimated to be less than 2 per cent, indicating the potential for raising handicrafts exports in the largely unexplored international market.

Challenges for the Twelfth Plan for Handicrafts

19.168. Like handlooms, the handicrafts sector, being a State subject, is also primarily the responsibility of the State Governments, and assistance is provided by Government of India to supplement the States' resources. However, while measures taken in the Eleventh Plan have helped in the revival of the sector, it remains beset with several constraints, many of which are common to the handloom sector already brought out in the previous section. Other challenges specifically faced by the handicrafts sector are indicated below.

TABLE 19.6
Performance of Handicrafts Sector during the Eleventh Plan Period

Item	2007–08	2008–09	2009–10	2010–11	2011–12	CAGR (%) (base: '08–'09)
Production (₹ crore)	31,940.36	19,375.88	20,221.58	24,393.14	30,257.18	16.01
Employment (lakh persons)	NA	58.50	62.60	68.86	72.30	7.3
Export (₹ crore)	17,536.78	10,891.85	11,224.27	13,526.66	16,851.27	15.70

Source: Office of Development Commissioner (Handicrafts), Ministry of Textiles.

Resource Mapping and Data Base

19.169. Several crafts are languishing and slowly dying due to prolonged neglect and lack of awareness, and inadequate appreciation of the intricacies and skills involved. Lack of proper processes and systems for identification, documentation and mapping of all crafts in India is still a major challenge. Data on craftspersons, including their socio-economic status, livelihood and family details, and scientific mapping of market trends and consumer profiles is also inadequate.

Infrastructural and Technological Gaps

19.170. The availability of infrastructure, including formal institutions/organisations for production, marketing and distribution of handicrafts in an organised manner is lacking and often non-functioning. Artisans do not have direct access to markets within the country and abroad. Lack of technological up gradation has aggravated the situation as age-old technology/methods of production are utilised, leading to inefficient operations and low quality of output.

Technical Resource Gaps

19.171. There is a lack of comprehensive data on equipments used by various crafts, apart from lack of concentrated efforts to develop good quality, low-cost tools for artisans. Several design banks are outdated and redundant, as they fail to undertake continuous revision through, inter alia, use of internet. Designers often lack requisite knowledge on practical application of crafts, and training programmes introduced to upgrade skills of artisans are treated as a one-time activity, with no mechanism to institutionalise learning.

Regional Imbalances

19.172. Regional imbalances continue to prevail with visible gaps in production and consumption (sales), as the northern and central regions account for bulk of the exports.

Programmatic Issues

19.173. Various programmatic issues, such as eligibility criteria, financial aspects and fund release pattern need to be reviewed to facilitate greater efficiency in implementation.

The Vision and Strategies for THE Twelfth plan for Handicrafts

19.174. The vision for the handicrafts sector for the Twelfth Plan is to create an equitable, world-class globally competitive and enabling environment, and provide sustainable livelihood opportunities to the artisans through innovative product designs, improvement in product quality, introduction of appropriate technology including modern technology, wherever required, and preserving traditions, thereby resulting in balanced socio-economic development and inclusive growth of the sector. In line with the vision, focus will be on consolidation of existing infrastructure including measures to ensure sustainability; institutionalisation of systems of implementation and scientific evaluation and continuous monitoring of all existing programmes; and compulsory scientific mapping of crafts, artisanal communities, market trends and consumer profiles and using this as basis for introducing new schemes or programmes, where necessary. For this purpose, the existing programmes/schemes in the Eleventh Plan will be continued with suitable modifications and consolidation and, in addition, some new

initiatives will be introduced. Existing clusters will be consolidated through design development efforts, intensifying forward and backward linkages, and fostering compliance and quality control, so that they become sustainable, vibrant and resourceful centres of craftsmanship. Core issues of water and energy management, sanitation facilities for workers, and crèche facilities for women artisans will be included mainly through convergence with other programmes, and details on raw material availability and related information will be placed in public domain. New clusters will be demand and need-driven, and set up under the PPP mode wherever possible. MFIs and Non-Banking Finance Companies (NBFCs) will be tapped as additional sources of credit, and banks will be encouraged to ensure that lending to artisans which falls under priority lending, is at least 10 per cent of such lending, and give due thrust to the Scheme of Artisan Credit Card (ACC). Technological interventions will be promoted to enhance competitiveness of handicraft products. Awards/scholarships will be introduced to encourage young generation craftpersons, and Shilp Gurus/National Awardees will be conferred honours at par with other National honours.

19.175. The marketing strategy will involve sustained focus on brand building and promotion of 'Handcrafted in India' brand through a dedicated campaign to promote domestic sales as well as exports, including a new consumer awareness scheme for domestic markets, introduction of national level events on the lines of National Handlooms Expo, and greater involvement of the private sector including the civil society. PPP mode will be encouraged at all levels in marketing promotion. Steps will be taken for adherence to compliance issues so that products meet the acceptable international quality standards and also convey their historical, cultural and traditional significance. As proposed for handlooms, States will be encouraged to leverage the unique skills and products of the handicrafts sector to develop tourism potential in individual States through suitable linkages with the tourism industry. Efforts will be made to conceive or upgrade craft training programmes to cover core areas such as craft design, technology, marketing

and management through recognised institutions and universities. Social welfare measures will be modified to provide for improved delivery, monitoring and grievance redressal mechanisms. A new Scheme called the 'Infrastructure and Technology Development Scheme' will be introduced by shifting the infrastructure components of existing schemes for developing infrastructure with focus on technology. Emphasis will also be placed on establishment of Handicrafts Museums/Conservatories/Resource Centres for preservation, revival, archiving and documentation of languishing crafts. Another new initiative called the 'North Eastern Regional Development Scheme' is proposed, to tap the potential of handicrafts in NER, by facilitating access to markets, providing infrastructure support for improved quality and productivity and introducing an institutional framework of development.

19.176. Major interventions proposed for the handicrafts sector during the Twelfth Plan are given in Box 19.4.

THE WAY FORWARD

19.177. In the Twelfth Plan, the overall policy framework for the handloom and handicrafts sectors will be to focus on consolidation of gains achieved from the existing schemes/programmes, along with impact evaluation and suitable modifications in the schemes to improve their efficacy and delivery. Special focus will be placed on promoting a unified 'Handmade in India' brand for Indian hand-crafted products and encouraging greater synergy between handlooms, handicrafts and khadi and village industry sectors to achieve more efficient utilisation of resources and improved performance of the sectors, with as much emphasis on domestic markets as for exports. There will also be a focus on supporting private entrepreneurship and professionalism along with institutionalisation of e-governance and leveraging of innovations for achieving sustainable growth of the sectors. Special efforts will be made towards preservation, revival and documentation of languishing crafts, and harnessing the rich tradition of handlooms and handicrafts in the country to develop tourism potential. State Governments will be encouraged to adopt innovative measures to popularise handlooms

Box 19.4 Twelfth Plan Schemes for Handicrafts

Babashab Ambedkar Hastshilp Vikas Yojna: Consolidation of clusters by strengthening existing skills, harnessing design development efforts; New clusters preferably in PPP mode.

Design and Technology Up-gradation Scheme: Introduction and dissemination of new Designs; Development of Innovative Technologies/Technical Processes; Showcasing of Prototypes in Exhibitions as well as online.

Marketing Support and Services Scheme: Initiation of new consumer awareness scheme for increasing domestic sales; Introduction of national level events; Brand promotion; Domestic Exhibitions and International Exhibitions/events.

Human Resource Development Scheme: Introduction of Craft Training Programmes in design, technology, marketing and management through recognised institutions and universities.

Handicrafts Artisans Comprehensive Welfare Scheme: Modified Rajiv Gandhi Shilpi Swasthya Bima and Janashree Bima Yojana; Credit Guarantee/Interest Subvention; Cards to new Artisans.

Research and Development Scheme: Completion of Handicrafts Census; Studies on languishing crafts; Occupational Health and Safety Issues; Special advocacy efforts for benefit of artisans.

Infrastructure and Technology Development Scheme (New): Strengthening of Raw Material Depots/CFCs as well as opening of new ones; establishment of Mini Haats/Urban Haats; Construction of warehouses; Handicraft Museums.

Special Package for NER (New): Capacity development; Setting up State Initiative Design Centre/International Craft Complex; Raw Material and Design Banks; Marketing Extension activities.

and handicrafts within their States as well as in other parts of the country. Policy will also focus on promotion of financial inclusion and financial literacy support programmes, addressing environmental and occupational health and safety concerns, recognising the contribution of women in their own individual capacities, and giving arts and crafts education its due place in mainstream educational systems. Mechanisms will be put in place to define goalposts and provide for periodic reviews to ensure compliance of policy directives. The proposals included in the Twelfth Plan, spanning institutional, financial, administrative and strategic reforms, are aimed at raising the production and productivity of the handloom and handicrafts sectors, so as to provide better prospects for the crafts and the crafts persons as well as to fully tap the potential inherent in the two sectors to contribute towards national development through higher production and exports. The outlay for these sectors is included in the overall outlay of the Ministry of Textiles.

YOUTH AFFAIRS AND SPORTS

19.178. The youth play a crucial role in shaping a country's destiny. The Twelfth Plan would focus

on all round development of youth by empowering them with attitudes, skills and competencies so that they can fulfil their legitimate aspirations and engage more effectively in the process of nation building. In the area of sports, the vision is to broad base participation in sports and games, particularly participation of students in schools and institutions of higher education and to excel in national and international competitive sports to bring glory and pride to the nation. With a view to provide special focus to the activities of youth affairs and sports, these were bifurcated into two Departments in 2008. These are discussed below one after the other.

19.179. Even though public spending on youth affairs and sports has risen from a meagre ₹1,146 crore in the Eighth Plan to ₹14,764 crore during the Eleventh Plan, it remains very small, just about 2 per cent of the public spending on education. This should progressively be increased to 5 per cent over the years. More so, the relative share of the States has continuously gone down from 62 per cent in the Eighth Plan to 43 per cent during the Eleventh Plan. This needs to be enhanced.

YOUTH AFFAIRS

19.180. The total youth population (10–35 years) in the country was 563 million as per Census 2011 with about 70 per cent living in the rural areas. With a view to bring greater focus and better targeting, youth is being redefined to cover people in the age group of 15 to 30 years in place of 15 to 35 years. A youth development index to serve as a ready reckoner for educators and policymakers is proposed. There would be focus on developing qualities of good citizenship and community service amongst the youth and inculcating in them the spirit of volunteerism. They would be provided training and research support and encouraged to take up sports and adventure activities. Youth travel would be promoted and initiatives would be taken to create an international perspective amongst them. All this would be done by building on synergies with the activities of other ministries, departments and agencies. Special focus would be on the rural youth. These efforts would aim at channelising youth energy in productive activities and engaging them in nation-building activities. Aligned with this thinking, a National Youth Policy would be formulated through a consultative process.

19.181. The above objectives are currently being met by implementing various schemes such as National Service Scheme (NSS) in collaboration with State/UT Governments and expansion of activities of Nehru Yuva Kendra(s), National Youth Corps, scheme of youth hostels and so on. In addition, several ministries and departments like Health, Women and Child Development, Education, and Rural Development are also implementing various programmes for youth.

REVIEW OF THE ELEVENTH PLAN

19.182. Currently, there are 12 schemes/programmes that either support youth-based organisations and/or support youth development activities. The progress under these various schemes during the Eleventh Plan has been uneven. The NSS has not been able to keep pace with the expansion of the university, college and +2 school networks. The NYKs could extend its activities much beyond the districts already covered. Linkages between NYKs and grass-roots youth organisations such as youth clubs, sports clubs, Mahila Mandals continues to be weak.

Although NYKs have about 3 lakh youth clubs with membership of over 80 lakh, only about 1 lakh youth clubs were active at the grass root level as per recent survey. Female participation in youth development activities has been low. In States with large youth population the visibility of National Schemes like NYKs and NSS is poor. Coordination of the NYKs with the schemes run by other ministries/agencies continues to be a challenge.

TWELFTH PLAN STRATEGY AND INITIATIVES

19.183. The Twelfth Plan would look *de novo* at the existing policies, instruments and institutions, and suggest innovative policies, efficient and effective instruments and creative ways to rejuvenate institutions in order to utilise and channelise the youth energy in nation-building and economic development of society. Convergence in approach and synergy in action would be the key elements. NSS/NCC may be treated as compulsory co-curricular activity in educational institutions. Popular Village adoption activities for health and literacy should be expanded and training component for NSS volunteers strengthened and volunteers' services should be recognised with certification. The NYKs should set target for female membership and achievement should have weightage in grading of youth clubs. The NYKs should be evaluated before expansion. Convergence for optimal utilisation of NYKs/National Youth Corps is possible only with proper coordination between Centre and States in implementing various youth development programmes. A new National Youth Policy with focus on youth empowerment and employability will be unveiled.

19.184. Although most of these activities are funded under various schemes and programmes, there is a need for coordination and synergy for supplementing their efforts towards the development of youth in the following areas:

1. Utilising extensive youth network for implementation of programmes and for monitoring, oversight, social audit and so on.
2. Using the youth network for extension and awareness campaign for issues relating to girls' nutrition, dowry, female foeticide, voter

- awareness, drug abuse, alcoholism and so on; Capacity building of youth clubs for social empowerment under MGNREGA.
3. Training of youth leaders and formation of supervisory committees at village level under Pradhan Mantri Grameen Sadak Yojana (PMGSY).
 4. Prevention, education and awareness generation programme against Alcoholism and Substance Abuse in the States under Ministry of Social Justice and Empowerment.
 5. Promoting youth employability through provision of a variety of skill based training courses.

TWELFTH PLAN INITIATIVES

Rajiv Gandhi National Institute of Youth Development (RGNIYD)

19.185. During the Twelfth Plan, RGNIYD would be upgraded as an 'Institute of National Importance' and ultimately become an international institute of repute, meeting the requirement of youth development/leadership programmes of South East Asian and South Asian countries. The Institute would have strong research support by creating several self-sustaining Centres of Excellence in the areas of adolescent and youth development with knowledge capital infusion. The Institute would establish linkages with other national, State and regional institutions, including open university system, and create a network of institutions for carrying out its activities. The Institute would lay special focus on youth leaders from PRIs and on issues relating to youth and local governance.

National Programme for Youth Development

19.186. During the Twelfth Plan, an umbrella programme for youth development would be launched. It will bring activities under the ongoing programmes under one umbrella for better coordination. This would include:

- a. Strengthening of the network of Nehru Yuva Kendra(s)
- b. Expansion of National Youth Corps
- c. Support to organisations for activities related to youth development

- d. International youth exchange programmes

Nehru Yuva Kendra(s)

19.187. In the Twelfth Plan, the thrust of the Nehru Yuva Kendra(s)—NYKs—would be on consolidating, expanding and energising the youth club movement for engaging the rural youth in various socio-economic and community activities. NYKs services would be utilised for fostering national unity and secular values and stemming the tide of extremism, essentially through programmes like national integration camps, inter-state youth exchange, culture and sports activities and celebration of days and weeks of national importance. The reach of NYKs would be extended from existing 501 to all districts in the country with emphasis on increasing female membership. NYKs in collaboration with National Skill Development Corporation (NSDC) have taken up the initiative for providing young people with knowledge, new skills, insight and ideas to raise employability in the North East Region through 'Train the Trainers' Centres. Such activities would be replicated in other disadvantaged areas including left-wing extremist areas. Success of NYKs depends upon quality of coordinators and volunteers and 80 per cent of the operational cost is on salaries. Thus, it is necessary that the process of selecting District Youth Coordinators should be reviewed with a view to attract better talent.

National Youth Corps (NYC)

19.188. The NYC envisaged enrolment of 20,000 volunteers in the 18–25 age group to serve up to two years in nation building activities in lieu of fixed honorarium. In 2011–12, the enrolment strength was 18,808 and about 12,300 volunteers have been deployed in various Kendras across the country @ 2 volunteers per Block. However, keeping in view special circumstances in LWE districts and NER, there is a need to deploy additional volunteers. Expansion should be considered on evaluation of the scheme, both in terms of process and impact. The monthly honorarium of NYC volunteers would be enhanced to cover mobility and connectivity expenses. The NYC volunteers would be provided training in two phases, namely 15 days induction training and 5 days refresher training.

Support for Activities for Youth Development

19.189. The guidelines for National Programme for Youth and Adolescent Development (NPYAD) has been revised enabling financial assistance to State Governments, NYKs, NSS, and NGOs to participate in youth development activities such as vocational training, entrepreneurship development, national and state level exhibitions, camps and festivals, life-skills education, counselling and career guidance and so on. In the Twelfth Plan, the NPYAD would be modified and renamed as Programme for Youth Development (PYD). Promotion of Scouting and Guiding would be continued with expansion in membership and a renewed focus on inculcating in the youth a spirit of patriotism, social service and communal harmony. The membership would expand from 50 lakh to 55 lakh during the Twelfth Plan. Integration and coordination among NSS, NCC, and Scouts and Guides is also desired. Since the programme is centred on students, it is preferable to implement it in close coordination with the Ministry of HRD.

National Service Scheme (NSS)

19.190. The NSS would be revamped and strengthened with its coverage expanding from the existing 33 lakh by 5 lakh per annum over the next five years. The special focus would be on areas where the enrolment of volunteers so far has been low. It is planned to train about 10,000 programme officers, per annum, so that about 30,000 of them get training in a cycle of three years. Priority would be accorded to extend NSS to uncovered Universities, Colleges, Technical Institutes and +2 Schools under Higher Secondary Councils/Boards, particularly in low representation States like Bihar, Jharkhand, Chhattisgarh, J&K and all NE states. Enrolment of women volunteers would be encouraged through a targeted special drive. Village adoption activities such as under the Samarth Bharat Abhiyaan of University of Pune have been most successful in solving problems of sanitation, water management, tree planting and so on. Similarly, Soft-Skills Development Programme and 'Each One Teach One' literacy programme of Pune University are also success stories that could be replicated. NSS should have training programmes for disaster management and crowd management. The

existing funding pattern between the Centre and the States would be revised to 75:25 with special dispensation to NE states in the ratio of 90:10.

Youth Hostels and Youth Resource Centres

19.191. These would be strengthened by developing them as youth resource centres and making them vibrant with a lot of activities. The construction/operations of new hostels could be in franchising/PPP mode for addressing issues of site selection, construction, occupancy for other purposes and so on. Some existing hostels in tourist locations deserve one time grant for upgradation of facilities and infrastructure. Part of hostel could be run on competitive market rates so as to cross-subsidise and meet operation and maintenance expenses.

19.192. During the Twelfth Plan, a National Youth Centre at Delhi and five regional centres including one for the North Eastern Region would be established. These could be co-located with the existing youth hostels with additional investment for infrastructure and capacity building. The National and Regional Centres would become the hub of youth camp activities.

SPORTS AND PHYSICAL EDUCATION

19.193. After India hosted the Ninth Asian Games in 1982, Sports began to receive attention. This led to the creation of the Sports Authority of India (SAI) and the formulation of the National Sports Policy. This helped in generating awareness about the multidimensional character of sports and emphasised the need for making sports and physical education an integral part of the educational curriculum.

19.194. In 2010, the country successfully hosted the Commonwealth Games and created a world class sports infrastructure, achieving an impressive medals tally in swimming, gymnastics and athletics by overshadowing major sporting nations like South Africa and Australia. Also, the performance of Indians in recent Olympics has been quite good. A good beginning has also been made in strengthening and creating of sports competition structures at Sub-State levels. Broad basing of sports and mass participation is being pursued through Panchayat Yuva Khel aur

Krida Abhiyan (PYKKA) in a decentralised manner. Further, an opening has been made for development of school sports and in many States school playgrounds are being developed with assistance from PYKKA. The RTE Act 2009 mandates school sports facilities and provision of sports instructors. The Rashtriya Madhyamik Shiksha Abhiyan (RMSA) too provides for physical education instructors in every secondary school.

19.195. The conduct of National Games has been gaining importance and States are showing keen interest in developing sports infrastructure. National Playfields Association of India has been formed at National level and Sports Playfields Associations have been formed at state level in some of the States. Draft National Sports Development Bill has been formulated, which includes aspects such as participation of athletes in the management/decision making of the concerned National Sports Federations and the Indian Olympic Association through the Athletes Advisory Council, ensuring fair and transparent functioning of autonomous sports bodies and promotion of welfare measures for sportspersons and ethical practices in sports and games.

REVIEW OF THE ELEVENTH PLAN

19.196. There was twofold thrust in the Eleventh Plan. One was to broad base games and sports through PYKKA and secondly to promote excellence in national and international competitions. Under the PYKKA, 51,759 villages and 1,538 block panchayats were covered during the Eleventh Plan in the rural areas. This is however only 21 per cent of the total number of village and block panchayats. For the urban areas, a scheme of assistance for creation of Urban Sports Infrastructure (USIS) on pilot basis was started in the year 2010–11. This aimed at addressing the entire 'sports eco-system' in a holistic manner and included players' training, coaching and developmental needs and sports infrastructure.

19.197. The Sports Authority of India (SAI) continued its activities of promoting sports excellence, broad basing sports, talent identification and development through Netaji Subhas National Institute of Sports (NSNIS), Patiala and LNCPE, Thiruvanthapuram,

and its Training centres. In order to create a dope-free sports environment in the country, two separate autonomous entities, namely National Anti-Doping Agency (NADA) and National Dope Test Laboratory (NDTL) were established.

TWELFTH PLAN STRATEGY

19.198. The twin planks of Government policy of broad-basing of sports and achieving excellence in sports will continue to be pursued in the Twelfth Plan. While the primary responsibility for promoting sports culture will remain with the State Governments with active support from the Central Government through various schemes and programmes, achieving excellence in competitive events at the national and international levels will be the responsibility of various autonomous National Sports Federations. The role of the Government would be to create basic infrastructure as well as build capacity through training and resource support that will enable sportspersons to excel in various national and international sporting events.

19.199. Setting up of State Sports Authorities will be encouraged and Sports Complex Stadia, playfields and so on will be treated as 'Infrastructure' enabling viability gap funding (VGF) for encouraging investment through public private partnership and linkages with corporate social responsibility (CSR) of the corporate houses for Sports Infrastructure development at State and Sub-State levels.

TWELFTH PLAN INITIATIVES

19.200. Nurturing and promoting excellence in sports requires a long-term strategy. During the Twelfth Plan, a long-term plan would be drawn up by building on initiatives already underway and taking into consideration the shortcomings of the actions taken so far.

Sarva Krida Abhiyan

19.201. For broad basing sports and games and connecting them to the schools and colleges on one hand and local bodies on the other, Sarva Krida Abhiyan would be launched during the Twelfth Plan. This would bring all ongoing programmes under one umbrella for better coordination. This would include:

1. Panchayat Yuva Krida aur Khel Abhiyan (PYKKA)
2. National physical fitness programme
3. Support for sports in institutions of higher education
4. Support for sports infrastructure

Panchayat Yuva Krida Aur Khel Abhiyan

19.202. Under the Panchayat Yuva Krida aur Khel Abhiyan (PYKKA), the need now is to capitalise on the enthusiastic response that the scheme has evoked in the States and to enhance its coverage to all village and block panchayats during the Twelfth Plan period, as originally envisaged. School playgrounds will be developed by converging PYKKA with MGNREGA and State schemes. The NVs and KVs will also open up their playgrounds for neighbourhood schools. Local bodies will be persuaded to earmark open spaces and community parks for neighbourhood schools in urban areas. School adoption by national/international sports stars and corporate bodies will be promoted along with tax incentives for investment in school sports infrastructure. In consultation with all stakeholders, a national sporting calendar would be developed so that sports become an integral part of the annual calendar and parents do not view it as distraction from studies. Holding of state-level age group specific 'low-cost' sports would be promoted with a view to encourage continued excellence from school to higher education level. School-based investment as a part of SSA/RMSA will strengthen school sports and games. A full time sports teacher will be made available under RMSA and SSA will provide part-time sports instructor. Scholarships/stipends would be introduced for students excelling in sports.

National Physical Fitness Programme

19.203. Recognising physical fitness as crucial for social and economic well-being of the nation, a National Physical Fitness Programme (NFPF) for school children would be launched in the Twelfth Plan. Physical education, games and sports will be made an integral part of school curriculum. To be implemented along with the Ministry of HRD and the State governments, the scheme would encourage school children to be physically fit and concurrently

evaluate their fitness. This would be motivational. Students' scores/grades for physical fitness would be given adequate weightage and added to their academic scores/grades. Under this programme, all students of class 5 and above would be evaluated on six parameters of physical fitness, namely (i) cardio respiratory endurance, (ii) muscular strength, (iii) muscular endurance, (iv) flexibility, (v) explosive strength, and (vii) body composition (percentage of body fat).

Support for Sports in Institutions of Higher Education

19.204. An initiative to promote sports and wellness in the higher education institutions (HEIs) would be taken up in partnership with the Ministry of HRD and the Association of Indian Universities (AIU). Activities under this initiative would include—start fitness and wellness programme for all students, encourage HEIs to include physical education as general institutional requirement, raise participation in competitive sports from current 2 per cent students to 10 per cent, create and support departments and units for physical education in all HEIs with adequate staff, support creation of adequate sports infrastructure, encourage sports club system in HEIs, establish inter-disciplinary research centres on sports technology, sports medicine and sports management, and finally create an information network on sports. In view of increased demand for physical education teachers/Instructors, there is a need for expansion of Physical Education in universities/colleges in Western, Northern and Eastern Zones and NCTE should relax restrictions on B.P.Ed./M.P.Ed to expand intake capacity.

Sports Infrastructure

19.205. The Urban Sports Infrastructure Scheme (USIS) would be dovetailed with JNNURM project funds to benefit from synergy in the urban areas. Due to pressures of urbanisation, playfields are under serious threat. They need to be protected. All States should establish State Playing Fields Associations and take necessary steps for preservation, protection and development of playfields. The National Play Fields Association of India (NPPAI), as an apex body, would provide requisite support to the State

Associations with financial assistance provided by the Central and State Governments.

19.206. State-of-the-art sports infrastructure for competition and training for mega sporting events is created at various locations at considerable costs. Such sports infrastructure should be put to optimal use after the main events are over. For this, the concerned agencies would be encouraged to have viable plans for utilisation. Such sports infrastructure should be made available to District/State Sports Federations for preparation and training of sub-junior and junior level athletes as well as to the local community/schools. Possibility for setting up a separate company (possibly under the Sports Authority of India) for this purpose could also be explored. This could tentatively be called Sports Asset Management Ltd., whose job would be to develop plans for each asset and then to bid them out under transparent criteria. There should be efforts for intense use of sports infrastructure, particularly the expensive ones, in the evenings and night. Finally, public-private partnerships (PPP) in creation and operation of expensive sports facilities could be explored.

Promotion of Excellence in Sports

19.207. The country's performance in mega sporting events such as Olympic Games, Asian Games and Commonwealth Games has consistently improved over the years (see Box 19.5). Focused attention and improved funding along with better sports infrastructure and facilities and coaching through 'Operation Excellence' launched in April 2011 has helped in achieving this. As a matter of strategy, besides providing generalised training through national camps, individualised training was also provided to the players, tailor-made to their

specific needs, including training in foreign training institutes. The country should aim to get at least 20 Medals in Olympics 2016 and 30 Medals in Olympics 2020 and be amongst the top 10 sporting countries. In the Asian Games 2014, the country could aim to get 75 Medals and then 100 medals in Asian Games 2019 and be amongst the top 3 countries. With a view to achieve these targets, there would be a clear and well-funded strategy to build on past performance and further improve country's performance in international events during the Twelfth Plan.

19.208. 'Operation Excellence' so far is structured with short-term objectives. In order to build on this, a long-term vision for identification and nurturing of talent would be needed. The pool from which the elite sports persons are drawn has to be significantly enlarged. The skill sets of our sports persons has to be augmented through better coaching, more dependent sports medicines, better sports services and enhanced participation in competitions of higher standards, both in India and abroad. Focused attention is required in respect of 10 Olympic sports disciplines, namely athletics, wrestling, shooting, weightlifting, boxing, archery, badminton, field hockey, judo and taekwondo, rowing, sailing, kayaking and canoeing, in which India has greater potential for excellence and winning medals. For enlarging the pool, there is a need for identifying talent through grass-root competition, particularly in rural areas and nurturing sports talents through special sports schools, separate from mainstream schools with greater emphasis on sports training and coaching support. Early identification of skill sets of individual sports persons on a scientific basis—at least partly based on bio-medical and other scientific evidence—would be helpful.

Box 19.5 Upturn in India's Sporting Performance

The Country had won a total of 50 medals in the Commonwealth Games—2006 and the tally went up to 101 in the Commonwealth Games—2010. Similarly, India had won 53 medals in Asian Games—2006 that improved to 64 medals in the Asian Games—2010. India's performance in the London Olympics—2012 has been the best ever performance by the Indian contingent in the Olympic Games with six medals, up from three medals in Beijing Olympics—2008. In addition, 12 of the country's athletes secured 4th to 12th positions, while until then only 5 Indian athletes had secured such positions in all previous Olympic Games taken together. This shows the growing sporting potential of the country. India also had the largest contingent of 81 sports persons that qualified for participation in London Olympics.

Preparation of Teams/Athletes

19.209. The scheme for preparation of Indian team for mega sporting events with clearly defined roles/responsibilities for each agency/authority will be continued and supported with adequate budget during the Twelfth Plan. This would be linked to the scheme to support identified sportspersons who have attained a certain level of achievement. There is a need for greater convergence of all such initiative including support through National Sports Development Fund. Corpus for this fund would also be enhanced. There is a need for further enhancing the award money for these championships as well as introducing, during the Twelfth Plan, a system of giving cash awards to personal coaches, who may not fulfil the eligibility criteria of imparting 240 days training preceding the medal winning performance of their trainees, but who have trained the athletes for a substantial period of time.

Assistance to National Championships and National Games

19.210. The Scheme of Assistance to NSFs should be recast to provide financial assistance for conduct of National Games and national championships at senior, junior and sub-junior levels for both men and women. The level of financial assistance for conduct of national championships would also be raised substantially. The Twelfth Plan will encourage each State Government to have its own State-level games every four years—with teams from each district. This would be in parallel to the national games. State Games will spread the spirit of competitive sports to each district.

Pension to Meritorious Sportspersons

19.211. As regards meritorious sportspersons from Para-sports category, winners of gold, silver and bronze medals in Para-Olympics alone are eligible for pension. Now, since physically challenged sportspersons are taking part in CWG and Para-Asian Games, they should also be included in the scheme of Pension to Meritorious Sportspersons and given pension at par with able-bodied sportspersons. The scheme should be transferred to SAI and its funding could be included in the block grant of SAI.

Coaching Upgradation

19.212. The availability of well qualified coaches is a critical area for the promotion of sports excellence and requires focused attention in the Indian context. There is a need for producing quality coaches of international standards and developing a holistic system for imparting coaching within the country. Therefore, it has been decided to de-merge National Institute of Sports (NIS, Patiala) from SAI to form a new society, the National Institute of Sports Coaching (NISC). The establishment of NISC would go a long way in producing quality coaches of international standards to meet the requirements of our athletes and teams. There is also a need for keeping our coaches updated with latest techniques and methods of coaching in competitive sports and, for this, they should be sent abroad for short and medium-term courses in specific disciplines. Institutes and Sports Universities offering such courses in countries such as Cuba, Hungary, Belarus, UK, Australia, China, New Zealand and so on, would be identified.

Establishment of Network of Sports Training/Advanced Training Centres

19.213. With a view to nurture sports talent, a network of district sports centres and advanced training centres at the regional level would be established. To begin with, districts having high potential for sports talent would be identified and taken up. This would enable identification of sports talent from the grassroots level and nurture them over a long period of time and create bench strength of sports persons in various disciplines. These fully residential training centres catering to sports talent in age group of 8 to 17 years would preferably be co-located with Navodaya Vidyalayas, Kendriya Vidyalayas, Sarvodaya Vidyalayas, Schools under the armed forces or even well-established State Government schools. Possibility of setting up such schools even with the private schools subject to proper checks and balances could also be explored. These centres would have high quality sports infrastructure.

Sports Authority of India (SAI)

19.214. The SAI, as the apex body for promotion of excellence in sports, would be strengthened during the Twelfth Plan. Existing twelve (12) centres

of excellence catering to training requirements of national level athletes preparing for participation in international events would continue to be supported and more such centres with state-of-the-art facilities and international standard equipment would be established, particularly in sports disciplines where India has a higher medal potential. These centres should be given flexibility to engage the best National/International coaches and technical support staff to provide their services to National Teams and other players. The SAI would set up National level Institutes in their five major sports complexes in Delhi, such as National Institute of Hockey at Dhyan Chand National Stadium. These would become centres of excellence, training and research for these specific sports.

Sports Science and Sports Medicine

19.215. During the Twelfth Plan, existing sports science and medicine facilities at SAI Centres would be upgraded to prepare the country for the Commonwealth Games and the Asian Games in 2014. In addition, a National Institute of Sports Science and Sports Medicine (NISSM) would be set up to provide integrated and quality-assured testing services and for training and capacity building of leading experts to drive innovation and share knowledge that will have positive impact on sporting performance.

19.216. In order to address the fundamental weakness in the sports sector in the country, there is a need for focused and coordinated approach. There has to be a space for sports in the overall economic activity in the country. This would entail providing better employment opportunities to promising sports persons including better opportunities for career progression, commercialising and developing certain aspects of sports development and marketing so as to attract private sector participation and capital investment in sports.

19.217. The indicative Gross Budgetary Support for the Twelfth Five Year Plan for the Ministry of Youth Affairs and Sports is ₹6,648 crore.

NOTES

1. The resolution read as:

We recognize the role of travel and tourism as a vehicle for job creation, economic growth and development, and, while recognizing the sovereign right of States to control the entry of foreign nationals, we will work towards developing travel facilitation initiatives in support of job creation, quality work, poverty reduction and global growth.

2. Travel and Tourism Competitiveness Reports for various years published by World Economic Forum which ranks 139 countries on various parameters which effect travel and tourism competitiveness. The global ranking of India in respect of 'Government Prioritization of the Travel and Tourism Industry' is a reflection on the priority accorded by the Government and not on the actual performance.
3. Travel and Tourism Competitiveness Reports for various years published by World Economic Forum.
4. Ibid.
5. The Travel and Tourism Competitiveness Report 2011, World Economic Forum.
6. Eco-tourism is a comprehensive idea encompassing numerous concepts such as *Nature Tourism*, which aims at discovering natural wonders by minimising the impacts of people on the environment; *Adventure Tourism* and *Ethnic Tourism*, which takes the tourists into a cultural immersion within local indigenous communities.
7. The emphasis should be on decision making through the gram sabha rather than through the gram panchayat.
8. The electricity duty, tax on goods and passengers, motor vehicle tax and stamp duty levied by the States will not be subsumed in the GST at the time of its introduction.
9. In the case of the transport sector, credit for input tax is allowed by way of abatement on a presumptive basis. However, in the case of aviation services, credit for input tax including tax on ATF should be allowed on actual basis.
10. Travel and Tourism Competitiveness Reports for various years published by World Economic Forum which ranks 139 countries on various parameters which effect travel and tourism competitiveness. The global ranking of India in respect of 'Government Prioritization of the Travel and Tourism Industry' is a reflection on the priority accorded by the Government and not on the actual performance.
11. Travel and Tourism Competitiveness Reports for various years published by World Economic Forum.
12. Ibid.