

**Vision 2015:
Strategy & Action plan for
Food Processing Industries in India**

Volume 2

**Sponsored by:
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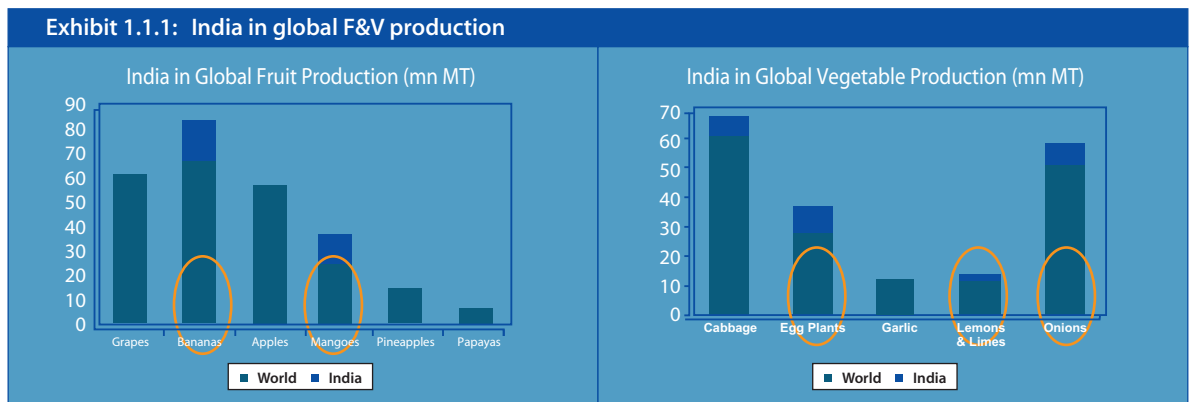
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Fruits and Vegetables based products

1.1 Background

India is the second largest producer of Fruits & Vegetables (F&V) in the world, accounting for ~10% of global F&V production¹:

- Vegetables: 82 mn tonnes (10.9% of global production)
- Fruits: 47 mn tonnes (8.4% of global production)



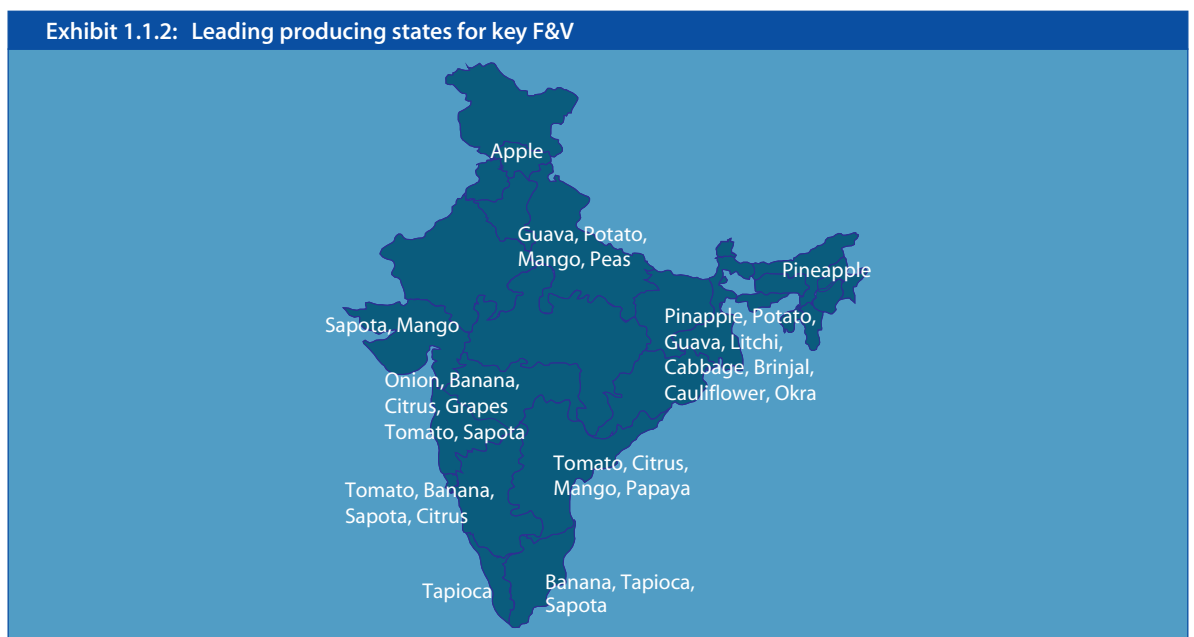
○ Signifies that India has more than 10% share in world production

All figures for 2003

Source : FAO

Note : Limes and Lemons are included as vegetables as per FAO classification

The key Indian states producing F&V are as displayed in Exhibit 1.1.2



Source NHB

¹Source: FAO

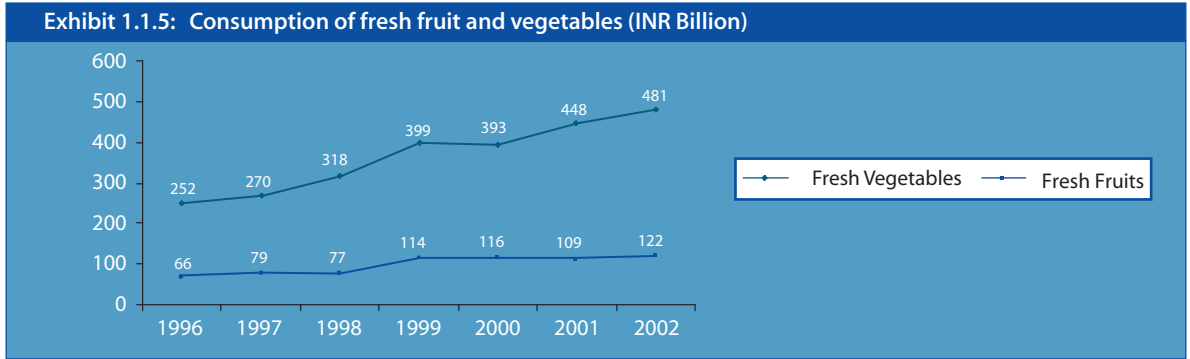
Exhibit 1.1.3: Leading producing states for key fruit	
Fruits	Leading states (share of production)
Banana	Maharashtra (28%), Tamil Nadu (25%), Karnataka (9%)
Mango	Andhra Pradesh (24%), Uttar Pradesh (20%), Bihar (13%)
Citrus	Maharashtra (36%), Andhra Pradesh (24%), Karnataka (8%)
Papaya	Andhra Pradesh (45%), Karnataka (9%), West Bengal (9%)
Guava	Bihar (19%), Maharashtra (11%), Karnataka (9%)
Grapes	Maharashtra (75%), Karnataka (14%), Tamil Nadu (4%)
Pineapple	West Bengal (27%), Assam (19%), Bihar (9%)
Apple	Jammu and Kashmir (79%), Himachal Pradesh (16%), Uttaranchal (5%)
Litchi	Bihar (62%), West Bengal (17%), Assam (5%)
Sapota	Karnataka (36%), Maharashtra (30%), Tamil Nadu (12%), Andhra Pradesh (12%)
Total fruits (incl others)	Maharashtra (21%), Andhra Pradesh (14%), Tamil Nadu (10%), Karnataka (9%)

Source: NHB

Exhibit 1.1.4: Leading producing states for key vegetables	
Vegetables	Leading states (production share)
Potato	Uttar Pradesh (39%), West Bengal (32%), Bihar (6%), Punjab (6%)
Brinjal	West Bengal (29%), Orissa (17%), Bihar (13%)
Tomato	Maharashtra (16%), Karnataka (15%), Bihar (10%), Andhra Pradesh (10%)
Tapioca	Tamil Nadu (59%), Kerala (38%), Andhra Pradesh (2%)
Cabbage	West Bengal (33%), Orissa (22%), Bihar (10%)
Onion	Maharashtra (25%), Karnataka (13%), Gujarat (12%)
Cauliflower	West Bengal (35%), Bihar (19%), Orissa (13%)
Okra	Bihar (26%), Orissa (20%), West Bengal (19%),
Peas	Uttar Pradesh (58%), Jharkhand (15%), West Bengal (5%)
Sweet Potato	Orissa (24%), Uttar Pradesh (23%), West Bengal (15%)
Total veg. (incl others)	West Bengal (20%), Uttar Pradesh (17%), Bihar (9%), Orissa (8%)

Source: NHB

Consumer Demand for fresh F&V is estimated at INR 600 Billion (at 1993-94 prices) growing at a CAGR of 11%. Of this growth of 11%, 1.9% is contributed by population growth while the remaining 9% is contributed by increase in per capita expenditure. This trend is depicted in Exhibits 1.1.5 and 1.1.6.



Source: NSSO, Rabo India

Exhibit 1.1.6: Per capita consumption trends in fresh fruit and vegetables (INR)

Year	Population Million	Fresh Vegetables Per capita expenditure (INR.)	Fresh Fruits Per capita expenditure (INR.)
1996	934	269	71
1997	950	284	83
1998	966	330	80
1999	981	407	116
2000	997	394	116
2001	1027	436	106
2002	1043	461	117
CAGR	1.6%	9.4%	8.7%

Source: NSSO, Rabo India

1.1.1 Processed F&V

Under 2% of the total F&V produced in India is processed either into the categories listed in Exhibit 1.1.1 A, or into fresh packed F&V. (Refer Appendix 1 for detailed workings). There are no official statistics available on the size of these processed F&V categories. Exhibit 1.1.1 A below provides estimated sizes of various segments. The organized segment comprises branded and packed products.

Exhibit 1.1.1.A: Processed F&V industry size			
Category	Industry size (INR mn)		Key players in organized segment
	Organized	Unorganized	
Jam	900	500	HLL, Mapro, Marico, Malas
Pickles	1,500	10,000	Priya foods, Praveen, Desai Brothers, Cavin Kare, GD Foods
Sauce / Ketchup	1,000	4,000	HLL, Nestle, GD Foods, Heinz
Pulp / concentrate	4,000	-	Foods and Inns, BEC, Clean Foods, Jain Irrigation, Usha International
Juices / Fruit based drinks	5,000	-	Pepsi, Dabur, Parle, Godrej, Mother Dairy
Squashes	1,300	2,500	HLL, Haldiram, Mapro
Ready to Eat Vegetables	1,000	-	Tasty Bite, ITC, MTR
Potato chips	2,500	3,000	Pepsi
Cooking pastes	300	-	Dabur, HLL
Total	37,500		

Fresh packed F&V, primarily an export led business, is a large industry in India, and is growing rapidly. India exported about 1.3 million tonnes (INR 14.5 bn) of fresh F&V in 2003-04² Export of these products has been growing at a CAGR of over 13% during the last 5 years. However, these volumes are insignificant, at under 1% of total production.

- There has been an increase in proportion of graded, packed F&V. The focus on specific varieties for different markets has increased in the past, exports were primarily targeted at the Indian ethnic population while now, Indian exports compete with other global suppliers across markets, to cater to a broader spectrum of world demand.
- In particular, organic within fresh has also assumed importance

The Indian consumer's preference for preparation of F&V based foods at home continues, although there is gradual acceptance of processed foods. A continuation of this trend is expected in the next ten years, which implies significantly higher growth potential for fresh packed F&V as opposed to processed F&V.

In order to fuel growths in Fresh Packed F&V as well as the Processed F&V sector, it is extremely important to address the production issues in the F&V sector.

The draft policy document prepared by the National Horticulture Mission is used as the base document and various action points are added/modified based on the discussions with various stakeholders in the industry.

²Source: Apeda

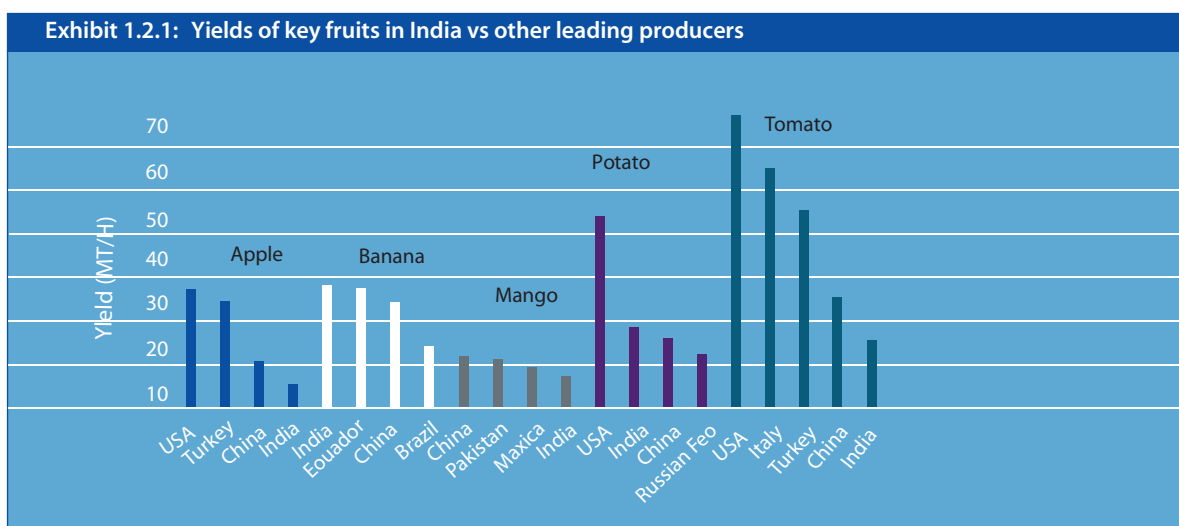
The following sections are organized into four modules:

- Research in F&V varieties
- Production practices and productivity
- Marketing
- Processing and value addition

1.2 Research

A. Low yields

The average Indian yields are low in comparison with the world's best, as seen in Exhibit 1.2.1 which provides the yields of the leading producers of key F&V. Indian yields are among the best in banana and grapes. However they are extremely low in most other F&V.



Source: FAO

There are several underlying reasons for low yields. One of the important reasons is the inappropriate varieties being propagated in India. In the case of bananas and grapes, new varieties have been introduced and adopted rapidly and successfully. The key factor contributing to success in these two cases has been the low gestation period for changing the varieties. However, the perceived risk in varietal change in other crops is higher, due to the longer gestation.

B. Inappropriate varieties

Apart from leading to low yields, Indian varieties in several F&V are associated with other issues:

- Lack of amenability to processing such as for oranges, potatoes and tomatoes.
- Low shelf lives, and therefore high cost of transport for domestic as well as export markets -Alphonso, the prized mango variety in India, has a low shelf life (not more than 20 days in appropriate cold store)

conditions) due to its thin skin. This renders it unfit for transport over long distances such as to the EU- it takes about 3 weeks for reefer transportation of products from India to the EU.

- Inability to export fruit / vegetable or attract large corporates into the F&V sector -many large corporates are evaluating contract farming models to tap Indian F&V for processing / marketing as fresh produce.

However the Indian varieties are often not suited for export or for processing. Initiatives based on varietal change can have a long gestation period, thus deterring entry of corporates into the sector.

Examples of such issues are summarised in exhibits 1.2.2 and 1.2.3.

Exhibit 1.2.2: Case study of mango

In spite of the 1500 varieties of mangoes grown in India, only 3-4 varieties are available at prices which render processing to be profitable. Due to the high demand for Alphonso in fresh form; it is expensive for processing into pulp. During the harvest season, the farm gate price of Alphonso is typically above INR 20 / kg against Totapuri which would be available even below INR 5/kg. Consequently, pulp prices are also higher. Totapuri is a cheap variety, with high pulp content, and therefore amenable to processing. Efforts are required to control the 'stone weevil' pest in the Totapuri variety (due to which it is banned in many countries). It is most important that India develops varieties of mango that are suitable for processing.

Exhibit 1.2.3: Issues with Indian F&V varieties in select products

Fruit / Vegetable	Issues
Potato	Indian growers are not focusing on varieties which are suited for processing. At present, the potatoes grown in India tend to have high sugar content and lack uniform size and length. Pepsi has developed its own variety for Lays in Punjab
Orange	Very old variety grown in India; not suitable for export or for processing into juice due to high pip content and high bitterness levels. Pepsi and Dabur import orange juice concentrate for their juices.
Apple	India is still promoting Red Delicious (which has strong local demand due to its low price) while other countries are phasing this variety out (due to its 'cardboard-like' texture). New Zealand and Australia have patented 2-3 new apple varieties over the last few years, and have gained share in exports

The key handicap in the Indian research system is that the public research set-up has no connect/channel of communication with Government agencies that market the seeds / propagation material and with retailers/traders who sell produce to the consumer/processor. Therefore research objectives are not aligned with market requirements. When any newly developed variety is marketed, the research institute is often

unable to support farmers with advice on appropriate cultivation or post harvest practices. This is due to various reasons such as shortage of manpower in the state extension departments, and lack of training of these personnel on appropriate cultivation practices.

For example, the Indian Government recently introduced a variety of kiwifruit in North India. However, in the absence of adequate support on cultivation practices, domestic produce is much smaller in size than imported kiwi and therefore commands 50% of its selling price.

1.2.1 Solution themes

In order to ensure that the additional financial outlay proposed by the NHM on research is successful, the following are required:

- Focus on a few fruits and vegetables which would lead to ease in monitoring. On demonstration of success, these can be replicated across products and geographies as detailed below:

Exhibit 1.2.1.A: Focus areas for fruits and vegetables*		
	Focus area	Focus states
Orange	Develop varieties suitable for processing (lower bitterness, low pip levels) into orange juice	Maharashtra, Andhra Pradesh
Potato	Develop varieties suitable for processing into French fries / potato chips (low sugar content, uniform length)	UP, West Bengal, Gujarat
Apple	India is importing significant quantities to meet the specific varietal requirements. This can be rectified if the appropriate varieties are introduced (imported from New Zealand, South Africa, China etc) in India	Jammu & Kashmir, Himachal Pradesh
Mango	Identify other varieties for processing, and reduce dependence on Totapuri and Alphonso. Further, export-worthy varieties with higher shelf lives also need to be developed	UP, AP, TN, Maharashtra
Sapota	Focus on cultivation of uniform size, firm fruits which have longer shelf life	Karnataka, Maharashtra, Tamil Nadu, Andhra Pradesh, Gujarat
Litchi	Need to identify varieties with higher shelf life, and smaller seeds	Bihar, West Bengal
Onion	Identify varieties of sweet and white onions which can be adapted to Indian growing conditions	Maharashtra

The above list is illustrative

- Launch research projects in conjunction with select private sector players who can support marketing tie-ups with farmers for new varieties. This will ensure that:
 - The farmers have access to an assured market for the new varieties
 - The private sector player provides adequate support to farmers, on adopting appropriate cultivation and post harvest practices

1.3 Production and productivity

This section examines the issues involved with propagation of new varieties, and dissemination of good agronomic practices for growth and post harvest management of F&V.

In vegetables, the issues of production and productivity management are relatively lower due to the increasing presence of hybrid seed companies. Use of hybrid seeds has translated into higher crop yields. Most seed companies also provide support to farmers to adopt good agronomic practices. In the case of fruit on the other hand, vegetative propagation mechanisms are used and therefore nurseries (public/private) are involved in developing and distributing the varieties. Most nurseries are typically single-unit operations, with limited scale and are therefore hesitant to experiment with new varieties.

A nation-wide approach to introduce new varieties in F&V may not yield the desired benefits for the following reasons:

- Expertise is required in developing appropriate germplasm through constant screening and mixing of varieties
- Long period for propagation (saplings need to be developed through tissue culture etc)
- Long gestation period for the farmer to change to the new variety either new acreage or replacing of old orchards is required. The investment typically yields fruit only after five years. Therefore the farmer incurs risk on changing to the new variety.
- Lack of funding from banks, given the long gestation period and risk of market acceptance of the new produce, in the absence of farmer processor linkages

Therefore it is recommended that state-specific programs (linked to regional strengths in production) with the involvement of private players need to be started.

1.3.1 Solution themes

A. Initiative - Pepsi and Government of Punjab

Pepsi and Government of Punjab have partnered to propagate new varieties of citrus fruits in the state. At present, Pepsi is importing FCOJ (Frozen Concentrate of Orange Juice) which is a raw material for Tropicana juice, marketed in India. The citrus fruit which will be cultivated in Punjab, will replace imported FCOJ. The Punjab Government has been actively engaged in providing requisite facilitatory support to Pepsi through the following measures:

- Purchase of germplasm
- Providing land for demonstration plots
- Engaged in demonstrations via Punjab Agriculture University (PAU) and the State Horticulture Department

As can be seen below, the project has not been investment-intensive for the State Government. The details of the program are provided in Exhibits 1.3.1 A and 1.3.2 B.

Exhibit 1.3.1.A: Pepsi-Punjab government project on oranges					
Germplasm		Quarantine and selection	Demonstration	Propagation	Growing
Pepsi	Identified classical varieties in Florida	Done at greenhouse run by Pepsi (technical expertise)	Numerous demonstration plots; the first one run by Pepsi on land leased by Government	Initial propagation at Pepsi greenhouse; saplings sold at price decided jointly with Govt	
Punjab Govt	Paid for the germplasm	Invested in the greenhouse	Other plots run by PAU /Horti dept with cost footed by Govt		
Pvt Nurseries				Private nurseries to grow based on training given by PAU; nurseries' enthusiasm based on farmer demand; success of crop in demonstration plots	
Farmer			Group of farmers sent to Florida for training (at own cost of farmer)		Saplings bought by farmer to be planted in freshorchards / to replace old orchards

Exhibit 1.3.2.B: Estimated costs of the Pepsi-Punjab government orange project		
Cost head	Fixed investment (INR mn)	Recurring cost (INR mn per annum)
Germplasm	5	
Greenhouse	15	7.5
Model / Demonstration farms (per farm)	0.25	0.25
Total	20.25	7.75

The key success factors of such initiatives are:

- Skill in identifying appropriate source of germplasm
- International fruit companies who are familiar with different varieties across the world can identify more varieties which are appropriate for Indian conditions and requirements.
- Skill in selecting varieties which can adapt to Indian conditions
- Developing and testing various combinations of root stocks and bud roots is essential to identify the varieties best suited to Indian conditions. Therefore, a well-equipped greenhouse is essential to
- undertake the initial selection and propagation.
- Ability to obtain buy-in of farmers / private nurseries to ensure mass propagation
- Demonstration plots are an important component of this project to highlight the benefits of new varieties and suitable cultivation practices to farmers. Further the involvement of the state horticulture department / university enables awareness of new varieties to a large number of farmers. A single nursery cannot ensure wide propagation of the new variety.

The Government needs to support such initiatives with appropriate training programmes at agricultural universities targeted at its own employees as well as producers.

- Financing of farmers

The gestation period for cultivation of any fruit is typically at least 3-4 years. Producers are unable to obtain financing for such a time period from banks/financiers at affordable rates. Without adequate financing which addresses the need for such a moratorium period, it is difficult to encourage farmers to experiment with new varieties, which may be more remunerative.

Lack of financing from banks / financial institutions leads the farmers to middlemen, who advance money to the grower, or take the farm on lease. This system has worked well in the Indian agricultural system as the farmer also passes on the risk of crop failure to the middleman. However it has also led to some malpractices as the middlemen engage in manipulation of selling prices, to enhance their margins. In mango for instance, the middlemen have been the cause for wide price fluctuations due to manipulative practices adopted by them to enhance profitability.

Crop insurance is key to enhancing the security cover for banks / FIs lending to farmers

- However insurance or credit in isolation cannot be the solution for the Indian farmer
- The Government needs to undertake pilots in high potential production clusters for fresh produce and comprehensively address farmer requirements through the following:
 - Introduce new varieties with high export/processing potential
 - Support new varieties with comprehensive extension training

- Subsidise premium on crop insurance - For most horticultural crops, the premium is as high as 5% for covering loss or damage due to Fire, Lightning, Storm, Hail Storm, Cyclone and other such natural calamities / Acts of Terrorists
- Facilitate linkages with large buyers (processors/exporters etc)
- These measures would in turn ease availability of financing from banks/FIs
- Financing of processors

The Government needs to treat the Food Processing sector as a priority sector for financing, irrespective of the quantum of financing. Currently, financing to companies with assets exceeding INR 50 mn is not classified as priority sector lending. A small (pulping capacity of 10 MT / hour) mango pulp plant (including aseptic facilities) costs over INR 70 mn and makes it ineligible to avail priority sector financing.
- Intercropping

Inter-cropping during the pre-fruit bearing period is a solution to the high moratorium period requirement during adoption of new fruit varieties. The State agricultural universities need to advise farmers on appropriate inter-cropping patterns to ensure a continued revenue stream for farmers.
- Farmer education

The government should sponsor farmer education programs / visits of Indian growers to other countries to learn appropriate cultivation practices. For example, the Maharashtra Government is proposing a scheme for sponsoring the visit of one grape grower per taluka to a leading grape growing country for 2 weeks.

1.4. Marketing and market intelligence

1.4.1 Domestic marketing

All sale of F&V in the domestic market is controlled by agricultural markets, established and regulated under the State APMC Acts. The geographical area in the State is divided and declared as a market area wherein the markets are managed by the Market Committees constituted by the State Governments. Once a particular area is declared a market area and falls under the jurisdiction of a Market Committee, no other person or agency is allowed to carry on wholesale marketing activities.

The current system of agricultural markets is associated with several problems:

- It discourages direct farming arrangements between farmers and processors / corporates who are keen to source appropriate quality raw material for their requirements. The APMC acts require such corporates to pay the mandi cess even if they are not utilizing the mandi infrastructure.
- The commission agents in the existing mandis have become extremely powerful in the fresh produce channel; often the farmer (who does not actually visit the mandi) is not paid the actual price fetched by his produce. The amount of power wielded by commission agents is evident in the price quoted in the unofficial markets for a license to become a mandi commission agent.

- The mandi cess is intended to be used for maintaining and upgrading the mandi infrastructure; however the funds are not always utilised for this purpose. The infrastructure at most mandis is far from adequate; similarly the loading and unloading practices for perishables have an adverse impact on the quality of the F&V.

A. Changes to the APMC act

The above issues were examined by the Expert Committee appointed by the Ministry of Agriculture on 19th December 2000 followed by an Inter Ministerial Task Force to review the present system of agricultural marketing in the country and to recommend measures to make the system more efficient and competitive. The Committee and the Task Force in their Reports of June 2001 and May 2002 respectively, have suggested various reforms relating to agricultural marketing as well as of policies and programs for development and strengthening of agricultural marketing in the country. The reports have highlighted that the situation of control over agricultural markets by the State has to be eased to facilitate greater participation of the private sector, particularly to garner massive investments required for the development of marketing infrastructure and supporting services.

The draft model act for agricultural marketing was finalized in September 2003 and incorporates the following:

- Government to facilitate / promote agricultural markets owned by private / cooperative entities
- Direct farmer-Processor/exporter linkages: Contract farming with direct buying arrangements between farmers and corporates
- Direct Purchase Centres, and Consumer/Farmers Markets for direct sale
- Promotion of Public Private Partnerships in the management and development of agricultural markets in the country.

State governments need to facilitate direct farmer processor linkages through suitable amendment of the APMC act. Further, mandi tax should be waived on all direct transactions.

Various states are in different stages of adopting the changes proposed by the draft model act on agricultural marketing. For instance, Karnataka, Andhra Pradesh and Madhya Pradesh have made amendments to its APMC Act in conjunction with the proposed model. Maharashtra is in the process of undertaking similar modifications.

In addition to the above modifications, it is recommended that for direct transactions, mandi and other associated taxes should be waived.

In October 2004, the Cabinet Committee on Economic Affairs (CCEA) has approved INR 1.9 Billion for setting up of new markets, strengthening and modernising the existing markets and upgrading Agmark laboratories. In order to avail of this scheme the State Government has to, at least, amend the Agriculture Produce Marketing Committee (APMC) Act. This is the first instance when a Central scheme has been linked to the progress a state has made on reforms. This is clearly a step in the right direction.

B. Auction model for domestic marketing

The auction model for F&V marketing is being pioneered in India by Mother Dairy at the Safal market in Bangalore.

The project, with an outlay of INR 1.5bn, gains strengths from its:

- Backward linkages
 - Mother Dairy spent two years on developing farmer associations who would be able to cultivate F&V as per the standards and grades developed by Mother Dairy
 - The procurement is expected to cover 200 horticultural farmers associations with 50,000 grower members for wholesale marketing.
 - About 50-60 extension and QA personnel of Mother Dairy are constantly in contact with the farmers
- Auction mechanism
 - Ceiling and floor prices fixed per defined lot
 - Clock timer moves down from the ceiling price and allows a registered buyer to lock in the desired price
 - Registered buyers can bid only upto the amount deposited with Safal in the morning this removes the risk related to buyer default

The Safal Auction market has commenced trial operations in 2004. Other states also plan to establish similar markets to compete with the established APMC mandis.

The key challenge for initiatives of this nature is to obtain wide participation from market making entities. Most existing commission agents are reluctant to shift operations to the auction market as they have paid astronomical sums to operate in the APMC mandis. Further, these agents wield tremendous power in the mandi, which is unlikely in the auction market given the price-setting mechanism and other operating procedures which limit the role of intermediaries.

The auction market would need to market itself to new players (large existing retailers, other distributors etc) to attain higher volumes.

1.4.2 Export marketing

The exports of fruits and vegetables from India are listed below:

Exhibit 1.4.2.A: Exports of various F&V based products in 2003-04				
Item	2003-04		3 Year CAGR	
	Volume (tonnes)	Value (INR bn)	Volume	Value
Fruits & Vegetables Seeds	10,657	1	13%	13%
Fruits and Vegetables				
Fresh onions	859939	7.2	40%	47%
Other Fresh Vegetables	188321	2.5	5%	0%
Dried Nuts(Walnuts)	6418	1.0	-7%	-7%
Fresh Mangoes	60551	1.1	17%	17%
Fresh Grapes	26784	1.1	35%	33%
Other Fresh Fruits	149294	1.7	16%	8%
Total for Fruits and Vegetables	1291307	14.6	28%	21%
Processed Fruits & Vegetables				
Dried & Preserved Vegetables	211160	5.2	0.5%	-1.6%
Mango Pulp	89515	2.4	8.0%	0.1%
Pickle & Chutney	63053	1.2	27.5%	-0.2%
Other Processed Fruits & Vegetables	66070	2.4	3.8%	9.9%
Total for Processed Fruits & Vegetables	429798	11.3	5.5%	1.1%

Source-APEDA

A. Key factors influencing export competitiveness

(1) Price competitiveness

There is a wide fluctuation in the prices of Indian F&V based processed products. For example in the Middle East, prices of Totapuri pulp from India displays wide fluctuations across seasons (for example USD 0.3 -0.4 / kg in 2001 and USD 0.7 - 0.8 / kg in 2002). This is primarily due to manipulative practices of middlemen involved in fresh mango trade, and also due to lack of availability of accurate production estimates on the mango crop. Countries from South America offer more consistent prices and are a threat to India. India's dominance in the pulp sector is gradually eroding due to this factor.

Hedging of mango prices is possible if exporters have established relationships with growers and contracts / leases at pre-fixed rates. However, as most existing players use middlemen to procure mangoes, it is difficult to mitigate risk on account of price risk fluctuations of the raw material. This further underlines the need for modifications in the APMC Act to facilitate direct farmer exporter linkages.

(2) Marketing efforts

Indian products (both processed and fresh) need to be de-commoditised through effective marketing highlighting differentiating attributes, supported by tactical initiatives such as sales promotions and participation in marketing fairs/trade exhibitions etc (refer to Chapter 4, Volume 1). Exports of organic fresh produce is a large opportunity, which could be tapped effectively through a combination of product development strategies, together with strong impetus on promotion in target markets. Further, there is a need to develop processed F&V based products which are tailored for the palate of the importing market.

The Central Government should set up an institute that focuses on R&D in the processed F&V sector and develops low-cost, innovative products and packaging options, aligned with requirements of the export market (refer to Chapter 7, Volume 1)

Zespri's success in marketing of kiwifruit is well established. The organization has been able to achieve this through a consumer-led strategy, while adopting a holistic supply chain approach to address various bottlenecks and issues in the areas of research, distribution and marketing.

Exhibit 1.4.2.B: Zespri's marketing of kiwifruit

- Cooperative structure - owned by 2500 owner producers
- Exclusive marketer of ZESPRITM GREEN, GOLD and ORGANIC Kiwifruit
- Global marketers with regional offices centred in Europe, UK, Japan, Taiwan, South Korea and North America selling in 55+ countries
- Has 21% share of the kiwifruit exports market. This is despite the fact that New Zealand is not the largest grower of kiwifruit
- Integrated from orchard to consumer via ZESPRI™ System

Key success factors for zespri

- Start with the consumer
- Intelligently resolve technical issues "innovate or die"
- Capture the value by branding
- Involve key retail players
- Use IPR to deliver optimum product quality to retailers/consumers
- Be confident, and spend sufficiently during launch phase (2-3 years)
- Relative investment levels in different stages of development
 - Research - product development and variety selection - X 1
 - Development - grower involvement, planting/grafting/growing/new systems and resolution of technical issues X 3
 - Market Launch - involve trade and consumers - X 10

There are learnings to be drawn from the Mexican vegetable industry and its orientation towards export development, which have been highlighted in Exhibit 1.4.2 C.

Exhibit 1.4.2.C: Case study-Mexican vegetable industry

Mexico produces a wide range of fresh vegetables, among which the main vegetables produced and consumed in Mexico are tomatoes, chillies (including bell peppers) potatoes and onions. Together they account for more than 60% of the total cultivated area.

Diversity in production cycles of vegetables provides the key competitive advantage for Mexico in international markets. It is possible to find regions in the same state with different harvesting seasons depending on the climate and conditions under which the crops are grown. This makes it possible to produce vegetables throughout the year for both domestic and export markets. The fall/winter crop cycle is aimed at the export market while almost all spring/summer season production is destined in the local market. Production for export is concentrated in just a few Mexican states. They produce for specific market seasons: Sinaloa for winter production, Sonora for early spring, Guanajuato for winter and summer, and Baja California for summer.

Export market - Exports of Mexican fresh vegetables have grown by an average of 10% annually over the last 6 years. Mexico's aggressive policy of opening up its economy has been the key driving factor for this growth. Further, the technological advances made in Mexico that have translated into commercial advantages such as ESL (Extended Shelf Life) tomato. Growing consumer demand in the United States for fresh vegetables has also contributed to increasing exports.

Looking to the future - There has recently been an increase in the number of companies from the Netherlands, Israel and Spain expressing an interest in investing in the greenhouse vegetable industry in Mexico. They regard this as an opportunity to sell competitively into the US market.

Exhibit 1.4.2.D: Organic products - The India perspective

Varied agro-climatic regions, prevailing traditional farming practices, local self-sustaining agri systems, sizeable number of progressive farmers and availability of manpower are some of the inherent advantages which can position India competitively so as to tap the growing international market for organic products.

However, certified organic production in India is still at a nascent stage and according to official estimates, there were only 1426 organic farms in India until Feb 2002 with an area of 2275 hectares under cultivation.

This amounts to just 0.0015% of the total cultivable land. According to industry sources and FAO statistics, the total organic production in India is around 14000 tonnes with Fruits and Vegetables accounting for 17% of the total production. Over 85% of the domestic organic produce is exported. The organic F&V produce exported currently comprise mango pulp, pineapple juice, banana puree and dry banana.

A holistic approach encompassing all the players in the value chain needs to be taken up to enhance growth in organic products.

- Organizing producers/ farmers at the field level - Most of the organic producers in India are small farmers who are constrained by lack of proper know-how and resources, (i.e. knowledge on organic farming practices) infrastructure for storage and transport of the produce, forward linkages and adequate funds to get certification. Identifying and organizing these small organic farmers into organic farmer groups/associations, which can be trained and assisted on the various aspects of organic farming, should be taken up aggressively by Government through bodies such as APEDA so as to encourage development.
- Channel development - Training and educating traders/exporters on consumer preferences, providing them market intelligence and information, organizing trade meets and fairs, both at the local and international level so as to enhance customer relationships are some measures which can help augment growth. Processors also need to be trained and updated on the international standards for processing methodology, inspection and certification. Easy and continuous access to raw materials needs to be ensured to sustain growth. These initiatives need to be Government-led.
- Market development - Organic production is more than just a set of agricultural techniques and involves social, ecological and economic values within given cultural backgrounds. It is thus, more of a concept, which needs to be marketed rather than a simple product, which is sold. The awareness of the benefits of consuming organic products needs to be communicated effectively to the consumers. Industry associations can launch aggressive media campaigns for their respective product segments to achieve this objective.

(3) Regulatory issues related to exports

India would have to adhere to the sanitary and phytosanitary (SPS) requirements as applicable in various

countries. Most the countries such as in the EU and in the Middle East follow CODEX standards. However, the quarantine requirements vary across countries and are more rigorous in the USA, Japan and Australia. For example in Japan, Indian mangoes without Vapour Heat Treatments (VHT) are banned from entry. In Australia, fruit fly is the key issue restricting exports of Indian mango based products, while in the USA, the main concern is Mango Stone Weevil. Even after complying with these requirements, Indian exporters need to invite and sponsor visits (~ USD 100,000/visit/person) of the quarantine departments of the relevant importing country for lifting of the ban. These costs are prohibitive, and given the current structure of the Indian industry characterized by small players, and has restricted access to large markets such as USA and Japan.

The Government needs to take a more active role in ensuring that Indian produce meets the current / future requirements of large import markets. For instance, the Government has supported the grape industry's efforts to align its produce with Eurepgap requirements which become mandatory from January 2005.

(4) Air freight costs

Apart from the problems highlighted above, the biggest infrastructure hurdle in export of Indian F&V (especially fresh) is the high air freight rates. Air freight rates in India have been particularly high due to various surcharges (fuel and war surcharge).

Exhibit 1.4.2.E: Fresh mango freight costs sea vs air			
	Air (USD /kg)	Sea (reefer) (USD /kg)	Air freight /Sea freight
INDIA			
Mumbai Dubai	0.78	0.08	10.4
Cochin Dubai	1.00	0.09	11.1
Mumbai London	2.00	0.15	13.3
Mumbai -Hong kong	1.22	0.11	11.1
Chennai - Hong kong	0.93	0.15	6.2
Chennai Dubai	1.02	0.14	7.6
Mumbai Shanghai	1.89	0.13	15.1
PAKISTAN			
Karachi-London	1.26	0.12	10.7
Karachi-Dubai	0.49	0.08	5.8
SOUTH AFRICA			
Johannesburg Dubai	0.89	0.13	7.1

Source: Rabobank Research

The fuel and war surcharge on air freight rates should be abolished for fresh/processed F&V exports.

(5) Market intelligence

The current infrastructure available with the State Governments to collect statistical data on actual land and production volume in horticulture is grossly inadequate. Further there are significant delays in release of such data/information. Such data cannot be used for any research by the industry; nor can be used by the industry / farmers to anticipate prices or plan production. Therefore the sowing / planting decisions made by the farmer are not based on anticipated production volumes. Similarly prices of horticultural crops are often influenced by rumours and not by actual production volumes (the case of mangoes has already been mentioned in this document).

There is an urgent need to standardize the statistical measurement techniques across all states. Further there should be a deadline for all states to release their past production data, and production forecasts.

1.5. F&V based processed foods

The F&V based processed food sector is not a very large industry. Historically many F&V based products were reserved for the small scale. However the restrictions have been lifted for most products (except pickles and chutneys).

However, due to the past restriction, a significant proportion of F&V units are housed in the small scale sector. Therefore processing is characterized by a high degree of fragmentation and low capacity utilization. The single largest issue with the processing sector is the lack of scale in most units, which in turn is linked to absence of backward and forward linkages.

1.5.1 Lack of scale or size

- **Low quality standards** - Few processing units comply with quality standards which are an essential requirement, particularly for the export market. This has resulted in poor hygiene and quality levels across the processing industry. Despite widespread knowledge of such practices, adherence to quality cannot be enforced due to difficulty in monitoring the quality in such a large number of units.
- **Lack of backward linkages** - The Indian mango processing sector has not been able to establish linkages with farmers to secure desired volumes and quality of raw material due to the prevailing APMC Act (companies need to obtain specific permissions to source directly from farmers). Absence of backward linkages, and consequently the significant channel power of middlemen have hampered growth of the industry, especially for export-focused units.

- **Inability to invest in market development** - Small size of processing units has also restricted the following:
 - Focus on promotions for market development,
 - Research in new product development,
 - Research on consumer preferences
- **Limited understanding of alternate uses of the processing facility** - Most processing units are single-product facilities and are therefore operational for a few months during the year, given the seasonality in availability of raw material. Knowledge of alternate usage of their processing facilities and the market potential for these products will facilitate processors to utilize their assets more effectively.

The above problems demonstrate the importance of facilitating scale such that companies are better positioned to make large investments into the entire supply chain infrastructure for sustainable long term growth.

The various schemes of the Government have however hindered scale through:

- low ceilings on subsidies available for promoting investments (promoters prefer to set up two small plants rather than one larger plant)
- reservations for small scale sector in areas such as pickles, chutneys etc
- APMC Act which hinders backward linkages

The Government needs to review and modify these schemes to ensure that it does not reward small scale at the cost of dis-incentivising larger units. (Discussed further in section 1.5.5 on government schemes)

1.5.2 Lack of information on supply/demand trends

As mentioned earlier, one of the key stumbling blocks in export of processed fruit is the wide fluctuations in raw material pricing, which is controlled by middle men in the absence of accurate data on actual production levels. The Government needs to take adequate measures to release periodic (weekly / monthly) data on key crops estimated production and market arrivals. (Refer Volume 1 - Chapter 7 Section 7.2 Knowledge Management for more details)

1.5.3. Prevention of food adulteration (PFA)

Several studies and analyses have been conducted on the problems faced by the fruit processing industry due to the multiplicity of ministries and laws that control the food industry. Some of the overlaps between 2 such laws (FPO and PFA) are given below as examples of the operational problems for the industry.

- FPO allows use of artificial sweeteners in Fruit products. PFA does not [Rule 47]
- The emulsifiers and stabilisers permitted for use [eg. in Jams, Marmalade & Fruit Chutney] under PFA and FPO differ.
- As per FPO, jam should have a minimum % of soluble solids (sugar content). This implies that an “All-fruit No sugar” jam cannot be marketed.

The proposed Integrated Food Law would be able to address the above issues effectively.

1.5.4 Tax regime

- While there are no Central taxes on locally manufactured, F&V based processed foods, there are several state levies such as sales tax, octroi etc. which effectively translate into high tax rates for these products. For example, Sales Tax alone accounts for about 10-12% of MRP of processed F&V (Refer Exhibit 1.5.4 (A)). These high rates of taxation translate into higher consumer prices which in turn impacts consumption. **Several countries such as Ireland, UK etc provide a differential treatment to food products and do not levy any taxes on these segments. The State Governments need to adopt a similar stance to provide a fillip to the processed F&V segment.**

Exhibit 1.5.4.A: Cost structure for select packaged food products			
	Potato Chips	Jam	Packaged Juice
	INR	INR	INR
MRP	10	50	68
Retailer's Margin + discount	0.83	7.20	11.80
Distributor's Margin	0.44	2.18	3.50
Sales Tax	0.94	5.37	8.20
Excise Duty	1.04	0.00	0.00
Distribution	0.41	2.81	2.70
Returns	0.27	1.06	0.68
Manufacturing Cost	1.10	0.87	5.10
Packaging Cost	1.50	6.18	12.60
Raw Material Cost	1.25	9.52	5.80

Source: Rabobank Research

Further, there is a 16 per cent excise duty on packaging material meant for the food processing industry. This is high considering the fact that packaging material already constitutes a significant proportion of the cost of processed foods. For instance packaging material constitutes 50-55% of the production cost of packaged juices, and 35-40% for jams and potato chips. In order to promote consumption of processed foods, there

should be zero excise duty on packaging material.

(There is also a need for developing low cost packaging options for processed foods. This has been covered in detail in Chapter 8 of Volume 1 R&D, Knowledge Management and HRD)

1.5.5 Government schemes

Various organisations such as APEDA, Ministry of Food Processing, NHB and State Governments have launched schemes to incentivise investments in the food processing sector. These schemes can broadly be categorized into the following:

- For setting up new / upgrading existing processing facilities
- For creating backward linkages with farmers
- For market development
- For infrastructure development
- For promoting investment in R&D

However, there are several issues which need to be addressed to render Government schemes to be more effective in development of the sector.

- Subsidies are often back-ended, leading to uncertainty during preparation of financial and business plans
- An MFPI (Xth plan) scheme stipulates that grant will be provided to the extent of 25% of the plant and machinery at technical civil works subject to a maximum of INR 5 Mn (in General areas). The processing unit should start production only after a formal approval from MFPI, to be eligible for this scheme- this is an impractical condition from the processors' perspective as it hinders business operations
- Subsidies are push-based rather than pull-based
- Most schemes attract the promoters / investors to invest in certain infrastructure without providing the necessary support for the utilization of the infrastructure. For instance, an investor may be incentivised by the subsidy scheme on cold store to set up a cold storage unit without assessing its operational / business feasibility.
- The process and parameters for obtaining approvals for availing schemes are not transparent. In the absence of any certainty about receiving benefit from these schemes, genuine investors could be constrained for funds.
- Ambiguity

Some of the schemes for setting up processing units are ambiguous e.g. Andhra Pradesh offers an interest subsidy against 50% exports of installed capacity. However, the definition of installed capacity is not clear i.e. number of hours/day and days per year. Many mango processing units at Chittoor would have an installed capacity of 4MT/hr. However the mango processing season usually lasts for ~70 days and the units

are idle for the rest of the year.

The proposed scheme should address a genuine concern (area where the processor faces a lack of level playing ground or where there is temporary lack of competitive advantage) of the processor / investor / exporter. The major areas where the processor / exporter may face lack of competitive advantage are:

- Quality checks especially for meeting the requirements of markets in the EU, USA and Japan. Since most exporters to these markets send their samples to the importing country for checks (before actually dispatching the final shipment), it results in an additional cost burden on them. Therefore the Government can bear (fully / partially) the cost of all quality checks to support processors / exporters.
- APEDA already supports the cost of quality certification programs such as HACCP and Eurepgap. These should continue as the certification costs are still high as compared to other countries.
- APEDA supports the market development activities of exporters by organizing / participating in exhibitions / promotions in importing countries. These should continue as they have created significant mileage for Indian produce
- Operating costs in a cold store Indian power costs translate into higher costs of operating cold stores as compared to other countries. The Central/State government can subsidize a portion of the power cost of operating the cold stores.
- Transport costs currently Indian freight costs are very high especially in the case of air freight. Further exporters face severe infrastructural and procedural bottlenecks in exports due to poor frequency of ships / flights leaving from various ports / airports, and due to inefficiencies associated with customs clearances. Additionally terminal handling charges at several ports are also high (as compared to other high traffic ports of Jebel Ali, Felix Stove, Hong kong etc). These costs need to be brought down through higher throughput volumes. In the interim, the Government should provide a fixed subsidy on transport costs.
- R&D The government could reward leading product / process innovations every year, by reimbursing the research expenses incurred. In this manner, the government will ensure that its resources are invested in sustaining / promoting R&D infrastructure which will be utilized. Further, it will incentivise innovation by processors.

The government should engage a specialist organization for independent assessment of proposals. The organization should have the requisite functional and sectoral skills in this area.

1.6. Vision, strategy and action plan

The level of processing for fruits and vegetables is visioned to increase to 10% and 15% in 2010 and 2015 respectively. This will drive increase in market size to INR 290 bn in 2010 and INR 546 bn in 2015. The measures recommended earlier will catalyse increased level of processing, as well as improved capacity utilization of processing facilities.

Exhibit 1.6.A: Vision- fruit & vegetables

	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)
Fruits and Vegetables											
Production	129			4%		170		207		4%	4%
Processed											
Organised	1.7		29500	11%		17.0	254000	31.0	490000	39%	13%
Packed fresh F & V	1	12000	12000	9%		12.0	144000	20.0	240000	43%	11%
Other Processed	0.7	25000	17500	13%		4.4	11000	10.0	250000	30%	18%
Unorganised (other processed)	1	20000	20000	9%		1.8	36561	2.8	56253	9%	9%
Total processed	2.7		49500	10%		19	290561	34	546253		
Share of Processed (%)	2.1%										
Organised	1.3%					10%		15%			
Unorganised	0.8%										

Exhibit 1.6.B: Estimated investment in fruit and vegetable processing

	Capacity required			Investment required		
	Current Capacity (Tonnes/ day) & Utilization (%)	New Capacity required (2005-10) Tonnes/day	New Capacity required (2005-15) Tonnes/day	Investment(2005-10) (INR Million)	Investment(2005-15) INR Million	Total Investment (2005-15) (INR Million)
Organised	11333	79778	51746	69889	40159	110048
Packed fresh F & V	6667	60000	28571	60000	28571	88571
Other Processed	4667	19778	23175	9889	11587	21476
Capacity utilisation	50%	60%	70%			

Summary of recommendations

1. Research

- Focus on introducing new varieties in a few identified F&V in certain states so that the funds are focused on identifiable projects
- The State Government should launch research projects in conjunction with select private sector players who can support marketing tie-ups with farmers for new varieties.

2. Production and productivity

- Introduce new plant varieties in conjunction with private partners. The Government also needs to support such collaborative programs with investments in demonstration plots and nurseries
- Popularize crop insurance schemes through subsidized premia rates. This will also boost farm credit
- Sponsor farmer education programs in other Indian states and countries who have demonstrated superior performance in production/agronomic practices etc.

3. Marketing and market intelligence

- Amendment of APMC Act to enable direct farmer processor linkages
- The auction model for fresh produce marketing can be adopted by more states to encourage a better and more transparent pricing regime
- The fuel and war Surcharge on air freight rates should be abolished for fresh/processed F&V exports to bring the air freight rates down to reasonable rates.
- There is an urgent need to standardize the statistical measurement techniques across all states. Further Central/State Government need to provide production related data in a timely manner as also their production plan
- Expedite negotiations with other key countries, such as China, USA and Japan, to lift quarantine restrictions on Indian fruit exports into these countries

4. Processing / value addition

- Accelerate the acceptance and implementation of the new integrated food law
- The Government needs to remove reservations for small scale in sectors such as pickles and chutneys

Exhibit 1.6 C: Case study dereservation

The Government decided to dereserve the biscuits sector in 1997-98. This was undertaken after assessing the operating environment, which had the following features:

- Presence of 5-6 oligopolistic manufacturers in the medium/high priced segment, who had been present in the sector prior to reservation, which was perceived to be against the interests of consumers.
- Two distinct production segments - one for specialized products and the other reliant on the SSI sector, could harmoniously co-exist without detriment to the SSI sector
- Dereservation would promote competition in the large sector in the biscuit industry with attendant upgradation of technology and quality. It would also facilitate vertical linkages between the large and the small sector and hence usher in modernisation.
- This move would translate into market expansion, and thereby benefit the industry, besides benefiting wheat growers indirectly.
- Several other sectors have been de-reserved in the past for reasons, which are applicable to the food sector now, include
- Provision of level playing field for Indian players, who on the one hand are facing increasing competition on account of trade liberalization, and entry of MNCs in various snack food categories/preserves etc., but on the other are restricted in their ability to offer consumers a wide range of products due to such restrictions
- Reservation in manufacturing is a hindrance for the domestic sector to tap export opportunities effectively.

1.6 4: Action plan

Central government	<ol style="list-style-type: none"> 1. Remove reservation for small scale in pickles, chutneys 2. Accelerate the acceptance and implementation of the new integrated food law 3. Zero excise on packaging 4. Revamp of Government promotional schemes as described in section 1.5.5 5. Negotiate to lift quarantine restrictions on certain Indian fruit exports to countries such as Japan, China and USA
State government	<ol style="list-style-type: none"> 1. Commence standardization of statistical measurement techniques for measuring crop volumes, and set standards for release of timely data on crop production (past and projected) 2. Modify APMC Act to allow direct farmer processor linkages 3. Adopt auction model of marketing 4. Introduce new varieties of fruit and vegetables, in conjunction with private sector players 5. Nil sales and other state-level indirect taxes on F&V based processed foods

Dairy

2.1. Production

World milk production is estimated at 613 million tonnes growing at a CAGR of 1.1%. India ranks first in the world in terms of milk production. Indian production stands at 91 million tonnes growing at a CAGR of 4%. Hence, India contributes 4 million tonnes to the world's incremental production of 7.5 million tonnes. Despite a higher growth rate, the per capita availability of milk in India (229 grams per day) is lower than the world average (285 grams per day). Buffalo milk is now estimated to account for 57% of the total milk production in India.

India has a unique pattern of production, processing and marketing/ consumption of milk, which is not comparable with any large milk producing country. Approximately 70 million rural households (primarily, small and marginal farmers and landless labourers) in the country are engaged in milk production. Over 11 million farmers are organized into about 0.1 million village Dairy Cooperative Societies (DCS) (about 110 farmers per DCS). The cumulative milk handled by DCS across the country is about 18 million kg of milk per day. These cooperatives form part of a national milk grid which links the milk producers throughout India with consumers in more than 700 towns and cities bridging the gaps on account of seasonal and regional variations in the availability of milk. The Anand Model which involves setting up institutional infrastructure at the village, district and state level (owned and operated by the farmers the farmers) has progressively eliminated middlemen, enabling direct interface of producers with processors.

2.1.1 Key issues - production

The key issues in production include low productivity of milch animals and lack of quality control and monitoring mechanisms across the supply chain.

(1) Low productivity of milch animals

One of the key issues in production, is the low productivity of milch animals. India has the largest population of cattle (186 mn) and buffaloes (97 mn) in the world. While the average productivity of Indian cows is among the lowest in the world, the productivity of Indian buffaloes is among the highest in the world.

Exhibit 2.1.1.A: Average yield of cows in India	
Country	Average Yield (Kg per year)
India	800
World Average	3100
Australia	4800
EU	5700
USA	8400

Source: FAO

³Year 2004, Source: FAO

⁴Year 2003-04, Dept. of Animal Husbandry & Dairying, Ministry of Agriculture

⁵Year 2004, Source; FAO

The solutions for improving productivity include the following:

A

- Enhancing production potential
- Improve production potential of indigenous breeds of cattle such as Sahiwal, Gir, Rathi and Kankrej and breeds of buffalo such as Murrah, Mehsana and Jaffarbadi, through appropriate selection programmes
- Cross non-descript cattle with Holstein Friesian in areas with adequate feed and fodder and with Jersey in resource-poor areas
- Increase production and use of high quality feed appropriate to local conditions
- Increase production and availability of green and ensiled fodder

B

- Superior animal care facilities and processes
- Expand first-aid coverage through village level societies, NGOs etc.
- Increase vaccination of animals against HS (Haemorrhagic septicaemia) , BQ (Black quarter) and FMD (Foot-&-mouth disease)
- Develop National Animal Production and Health Information Systems, and Disease Free Zones in the country (As part of the Tenth Five Year Plan, the Indian Government is in the process of setting up three FMD-free zones in five major states in which export-oriented meat processing facilities are located)

(2) Lack of quality control and monitoring mechanism

There is a strong correlation between the quality of raw milk and the quality of the processed product. The bacteriological quality of raw milk in India at the time of milking is comparable with that in leading milk exporting countries (including EU, Australia and New Zealand). However, there is significant deterioration in milk quality from farm to factory. The deterioration takes place on two accounts:

- infrastructure issues (lack of all-weather roads, electrical supply for chilling centres, potable water supply, sewage disposal)
- Contamination through equipment, loss of time and lack of temperature-controlled storage/transportation.

Exhibit 2.1.1.B: Milk transportation & storage from farm to manufacturing unit				
	Farmer	Collection Centre	Chilling Centre	Dairy
Equipments	Utensils / Vessels	Handling equipment	Containers	Cans
Time (duration to transport from farmer to destination, in hours)	0	2-3	3-5	6-9
Temperature	Ambient	Ambient	4-5 degree centigrade	4-5 degree centigrade

Source: Industry, Interviews with producers, collection agents, Rabobank analysis

The time lag coupled with transportation at ambient temperature results in deterioration of quality in terms of Sensory Properties (odor, taste, colour), composition (Fat, SNF, Protein etc.), hygiene (bacteriological - pathogenic, somatic cells) and also leads to adulteration (water, foreign substances). The impact of the time lag and temperature during storage/transportation, on bacterial count in milk is depicted below:

Exhibit 2.1.1.C: Bacteria count at various temperatures and time intervals				
<i>Figures in Standard plate count per ml (in 1000)</i>				
Temperature	Fresh	24 hrs	48hrs	72hrs
4.4 °C	4	4	5	8
10 °C	4	15	125	6,000
15 °C	4	1600	33,000	326,000

Source: Industry Estimates

The above exhibit highlights that an incremental increase in temperature prior to pasteurization can lead to an exponential increase in bacteria count (EU standards allow a maximum of 100,000/ ml). Hence, transportation and storage in controlled temperature conditions is critical to preserve the quality of milk. However, cooling does not replace the need for hygienic milking conditions. An example of the impact of milking conditions on quality is described in the following exhibit.

Exhibit 2.1.1.D: Bacteria count in different milking conditions				
<i>Figures in Standard plate count per ml (in 1000)</i>				
Temperature	Fresh	24 hrs	48hrs	72hrs
Clean cows, environment and utensils	4	4	5	8
Dirty cows, environment and utensils	136	281	538	749

Source: Industry Estimates

The solution to the above issue lies in identifying and addressing handling, storage and transportation practices from the producer to the dairy plant and onward to the consumer, and facilitating improvement of hygiene, sanitation, food safety and operating efficiency in dairy plants.

The action plan includes:

- Increasing awareness about the importance of good quality milk among farmers
- Training of farmers on hygiene habits at farm level and collection centres
- Incentivising farmers through higher remuneration for quality milk
- Setting up quality testing infrastructure at the collection centre. This involves testing of bacteria count,

⁶Source: NDDB

acidity, smell/taste, conductivity, somatic cell count etc.

Installation of bulk coolers for efficient collection is critical in preserving and improving the quality of milk. Benefits of bulk cooling include:

- Longer collecting intervals (milk can be collected once a day instead of the current practice of collecting it twice every day) which reduces cost of transportation
- Flexibility in milk delivery & pick-up time
- Handling of cans is eliminated
- Increased potential for collection from producers in remote locations
- Maintenance of good hygienic conditions

The Government should incentivise dairies to invest in clean milk production and bulk cooling. The incentive can be in the form of reimbursing a part the cost of equipment for collection and testing.

- The government can develop a quality mark for milk on the lines of Agmark, which should include every important trait of milk quality, including:
 - hygiene quality: bacteriological and cytological traits, absence of pathogens and other contaminants
 - sensoric quality
 - nutritional quality
 - technological quality (processing ability)

This quality mark can be used by processors to differentiate their products vis a vis competition in the local and export markets. A case study of the Komul (Kolar District Cooperative Milk Producers' Federation) Dairy in Karnataka on the benefits of investments made in clean milk production, bulk cooling and training is as follows:

Exhibit 2.1.1.E: Case study - Komul dairy development project

Investment Made in procurement infrastructure

- Bucket Milking machines
- Feed racks, water bowls and partitions
- Supply of Automatic milk collection units
- Supply of Bulk Milk Coolers
- 10 sets of 1000 LPD
- 10 sets of 2000 LPD
- Supply of Hygiene Kits
- Training - Union and DCS staff

Outcomes (within six months of investment)

- Milk producers received premium of INR 0.10/Lit. of milk as compared to earlier
- Milk yield increased by 10% at Community Milking Parlours
- MBRT values improved from 0.45-2 hrs. to 5.45-6.30 hrs
- Bacterial count declined from 1.5-7 mn to 0.15-0.4 mn cfu/ml
- Loss due to spillage reduced at DCS
- Lowering of transportation costs - once a day trip of tanker
- Improved capacity utilization of milk and dahi manufacturing units - Higher returns to the union

2.2. Processing of milk

2.2.1 Level of milk processing

About 35% of milk produced in India is processed. The organised sector (large scale dairy plants) processes about 13 million tonnes annually, while the unorganised sector (halwais and vends) processes about 22 million tonnes per annum. In the organized sector, there are 676 dairy plants in the Cooperative, Private and Government sectors, registered with the Government of India and the state Governments.

Exhibit 2.2.1.A: Processing of Milk in India in organized and unorganized sector			
Degree of Processing	Type	Volume (million tonnes)	Share (%)
Unprocessed	Retention by rural consumers / sale to rural non-producers	39	45
	Sold as loose milk in urban areas	17	19
Processed (organized)	Packed liquid milk 8	8	
Value added milk products		5	5
Processed (unorganized)	Value added milk products	22	23
Total		91	100

Source: Technology of Indian Milk Products' handbook. Publisher: Dairy India Yearbook; Rabobank Analysis

The market size of processed products in the organized and unorganized sector (at 2003-04 prices) is estimated at INR 255 bn and INR 906 bn respectively.

Exhibit 2.2.1.B: Share of organised and traditional (unorganized) market (INR billion) in year 2002-03		
	Organised	Unorganised
Packaged liquid milk	98	-
Ethnic sweets	62.5	455 (Khoa based-375, chhanna based -80)
Curd and curd products		160
Cheese ²	21 (Paneer)	
Ice creams	8	-
Butter 5.2	60	
Ghee 35	210	
Milk Powder	38	-
Total	255	906

Source: CII A Report on Emerging Opportunities beyond Liquid Milk, Rabobank

There is huge potential for processing and value addition, particularly in ethnic Indian products, which are largely sold in unbranded form in the market. The key differences between the organized and the unorganised sector, is with respect to investments in preserving the quality of milk, technology used for processing and compliance with food standards. The solution lies in promoting investment in quality control and developing scalable efficient technologies for the unorganized sector.

2.2.2 Milk processing capacity

Milk processing capacity has grown at a CAGR of 4% over the last 6 years. Most of the new capacity is being set up by the private sector as tabulated below. In the cooperative sector, few entities control bulk of capacity (23% of the cooperative capacity in Gujarat, 25% each in Tamil Nadu, Karnataka and Andhra Pradesh and 16% with Maharashtra). Players in the private sector have limited scale in production, as compared to these cooperatives.

Exhibit 2.2.2.A. Milk processing capacity (million litres per day)								
Year	Cooperative		Private		Other		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1996	194	24.2	250	24.4	65	7.3	509	55.9
Share		49%		40%		12%		
2002	212	28.4		44%		17%		
Share		39%		44%		17%		

Source: Department of Animal Husbandry, Ministry of Agriculture

2.2.3 Key issues in milk processing

Key issues in processing include lack of availability of milk in the lean season, limited diversity in product mix, regional demand supply imbalances, lack of scale and lack of commercialization in ethnic products.

A. Lack of availability of milk in the lean season & limited flexibility in altering product-mix

Despite potential for processing, the capacity utilization of dairy plants is about 60% (assuming 300 working days in a year). The reasons for low capacity utilization are the lack of availability of milk, particularly in the lean season and lack of diversity in the product mix of companies. Robust growth in consumption of milk and milk products (discussed in the next section) has resulted in the entry of private sector players. Since procurement of milk is concentrated in certain milk-surplus clusters, it has contributed to increase in milk procurement prices as below:

Exhibit 2.2.3.A: Milk procurement prices in INR per Kg in western UP				
Year	Cow		Buffalo	
	Flush Season	Lean Season	Flush Season	Lean Season
1998	6.4	10	9.4	13
1999	7	11	11.3	13.5
2000	7.5	11.75	11.5	13.75
2001	8	12	11.6	13.8
2002	7.5	11.75	11.7	13.8
2003	8.5	12.5	12.3	14.5

Source: Industry Estimates

B. Regional demand-supply imbalances

Further, there are regional imbalances in production, capacity growth and consumption. For e.g. Rajasthan has 8% share in production and 11% share in consumption of milk products, however the share in processing capacity is 4%. This implies that farmers in the state are losing out on the potential for value addition. A similar situation prevails in Bihar.

Exhibit 2.2.3.B: Growth per annum in production, processing and consumption of milk and milk products						
States	Production Share	Production Growth (1991-92 to 2001-02)	Capacity Share	Processing Capacity Growth (1996-2002)	Consumption Share	Consumption Growth (1996-2002)
Andhra Pradesh	6%	6%	6%	1%	5%	6%
Bihar	5%	3%	1%	4%	7%	11%
Gujarat	7%	4%	9%	1%	9%	9%
Haryana	6%	4%	7%	2%	6%	5%
Karnataka	6%	8%	5%	5%	4%	8%
Kerala	3%	5%	1%	9%	3%	5%
Madhya Pradesh	7%	2%	3%	4%	7%	8%
Maharashtra	7%	4%	18%	4%	9%	7%
Punjab	10%	5%	7%	3%	6%	5%
Rajasthan	8%	4%	4%	7%	11%	5%
Tamil Nadu	5%	3%	7%	14%	4%	11%
Uttar Pradesh	19%	5%	18%	2%	19%	9%
West Bengal	5%	3%	2%	0%	4%	8%
Others	6%		12%		9%	
India		4%		4%		8%

Source: Department of Animal Husbandry, Ministry of Agriculture; NSSO

Bulk of new capacity in the period 1996-2002, has been established in the Northern states, Maharashtra and Tamil Nadu. Capacity expansion is expected to continue, driven by increased consumption of processed milk products. This will create competition for milk in key procurement belts of North India (Western UP, Punjab, Haryana), Rajasthan, Maharashtra, Tamil Nadu, Andhra Pradesh and North Karnataka. It is critical to match the increase in capacity with the increase in supply of milk supported by procurement infrastructure.

C. Lack of scale

The largest dairy player in India is Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF) with an annual turnover of approximately USD 0.5 bn (Financial Year 2002-03). The largest international dairy company is Nestle with annual turnover of USD 18 bn (Year 2003, turnover from the dairy business).

Exhibit 2.2.3.C: Annual turnover of India's leading dairy companies (INR bn)			
S. No.	Company	Dairy sales	Ownership
1	Gujarat (GCMMF)	22.4	Cooperative
2	Nestlé	8.4	Multinational
3	Mother Dairy	7.4	Cooperative
4	Hatsun Agro	3.1	Public
5	Dynamix	3.0	Private
6	Britannia	2.6	Private
7	Heritage	1.8	Public
8	Chitale Dairy	1.5	Private
9	Metro	1.2	Public
10	Creamline Dairy	1.15	Private

Source: Rabobank

The average milk processing capacity of India's leading dairy cooperatives is in the range of 0.1 to 0.35 million litres per day.

Exhibit 2.2.3.D: Scale of operations of India's leading dairy cooperatives				
State	Cooperative	Capacity (million litres per day)	Number of Dairy Plants	Average milk processing capacity per plant (million litres per day)
Andhra Pradesh	APDDCF	2.43	9	0.27
Haryana	HDDCF	0.53	5	0.11
Gujarat	GCMMF	6.59	19	0.35
Punjab	MILKFED	1.52	9	0.17
Rajasthan	RCDF	1	10	0.10
Tamil Nadu	TCMPF	2.6	15	0.17
Uttar Pradesh	PCDF	1.51	13	0.12

Source: NDDB

Lack of scale as mentioned earlier, is a significant reason for the inability to invest in procurement infrastructure, quality control, controlled temperature transportation on the one hand, and market development on the other.

D. Lack of commercialisation in Indian ethnic dairy products

India has huge potential in ethnic products, which has not been realized. Of the total milk produced in India, 46 % is used as liquid milk, 4 % for processing western dairy products and as much as 50% for processing into traditional dairy products. The market sizes of various ethnic products is tabulated below:

Exhibit 2.2.3.E: Market size of ethnic products (INR bn)			
Type of products	Intermediate products	End Products	Estimated Market Size (Traditional + Organised)
Acid Heat Coagulated Products		Paneer	21
	Chhanna	Rasogolla, Sandesh, Pantua, Rasomalai, Cham, Channa Murki, Rajbhog, Chhana Podo etc	517
Heat desiccated products		Kulfi, Rabri, Basundi	
	Khoa	Burfi, peda, Gulabjamun, Kalakand, Khurchan, Dharwad peda, Kunda etc	
Fat rich products		Ghee, makhan, Malai	310
Cultured products		Dahi, Mishti Doi, Lassi, Chhach / Mattha	160
	Dahi, Chakka	Srikhand etc	

Source: CII A Report on Emerging Opportunities beyond Liquid Milk

Gross margins on ethnic products, excluding cost of marketing and distribution, for the products listed above, range from 12% to 38%:

Exhibit 2.2.3.F: Net margin potential in ethnic dairy products					
	Dahi	Lassi	Kheer	Rasogolla	Paneer
Ex-factory cost	100	100	100	100	100
Raw material	34	40	33	33	58
Packaging	25	7	4	17	3
Utilities	8	7	4	5	3
Manpower	6	6	4	5	10
Storage and distribution	5	4	3	3	3
Depreciation and interest	6	6	4	5	11
Net Margin	16	30	35	38	12

Source: Technology of Indian Milk Products* handbook. Publisher: Dairy India Yearbook; Rabobank Analysis

Despite the attractive inherent profitability, manufacturing and marketing of ethnic products has largely been the domain of unorganized sector (halwaiis), which offer short shelf life products. The large-scale commercialization is not possible due to lack of suitable, low-cost packaging solutions, which can enhance the shelf life of ethnic products. Thus the Government needs to give impetus to research in this area, to enable realization of the potential of this segment (also Refer Volume I: Chapter 8)

E. Taxation

In addition to the issues discussed above, various taxes increase the price of end products. These taxes include purchase tax on milk (e.g. 4% in Punjab), entry tax (e.g. 3% in Kerala), octroi and sales tax on milk and milk products (e.g. 4.5 to 7% octroi and 10.3 to 15.6 % sales tax in Maharashtra) etc. The state-level taxes on manufactured products create a non-level playing field with the unorganized sector, which can price its products lower as there is no outflow on account of such levies.

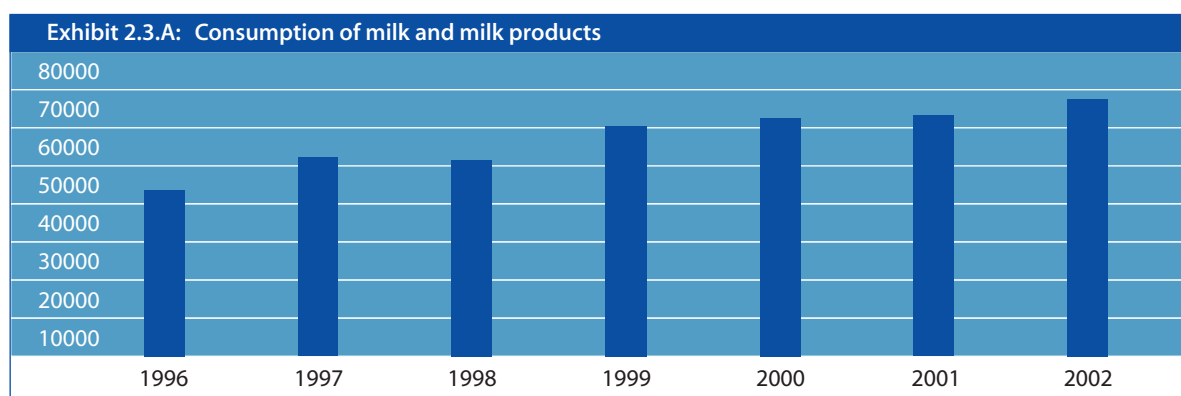
Further, there is high level of taxation on dairy equipment and machinery (16% central excise + 15.3% sales tax + 4% octroi), with the exception of a few products which are exempt. Also, the excise duty on polyethylene film, aseptic packaging machines, milk vending machines, pouch filling machines, used in packing and distribution increases the cost of packed and pasteurized milk.

2.2.4 Cooperatives in the dairy sector

Cooperatives have played an important role in the development of the dairy sector in India. They are engaged in milk production, procurement, processing and marketing. However, as yet, cooperatives reach only 18% of India's villages, covering 17% of dairy farmers. Further, they face increasing competitive pressure from private sector players, not only in terms of marketing but also procurement of milk. As against these agile players, the functioning of cooperatives has been constrained on account of the prevalent legislative framework governing cooperatives in India, which stifles initiative and leads to inefficiencies. The cooperatives need to be provided greater autonomy and encouraged to pursue the legitimate interests of their members in an effective, self-reliant, responsible, accountable and democratic manner. The recently enacted Producer Companies legislation, which provides the same legal and regulatory framework enjoyed by companies, but protects the basic principles of cooperation- voluntary and unrestricted membership, democratic member control, participation of members in economic decisions, autonomy and independence, is a suitable alternative. Effective functioning of dairy cooperatives could translate into significant benefits to dairy farmers, on account of assurance of a market for end-use of their products.

2.3. Consumption of milk and milk products

Consumption of milk and milk-based products is growing at a faster rate, than the growth in production. The estimated consumer demand for milk and milk products is INR 677 bn (at 1993-94 prices). Milk and milk products include liquid milk, condensed milk, baby food, ghee, butter, ice cream and other milk products. Demand for these products has grown at 7.6 % annually, from 1996 to 2002.



Source: NSSO Data and Rabobank Analysis

The consumption of milk and milk products in urban areas is about INR.280 bn growing at 8.4 % annually, and in rural areas, is about INR 400 bn, growing at 7 %. The growth in market size is primarily driven by increase in per capita expenditure. This trend is evident as consumers are shifting towards value added products.

Exhibit 2.3.B: Growth in population and per capita expenditure on milk and milk products

Year	Population (billion)	Per capita expenditure (INR)
1996	0.93	467
1997	0.95	549
1998	0.97	532
1999	0.98	618
2000	1.00	628
2001	1.01	625
2002	1.03	659
CAGR	1.6%	5.9%

Source: NSSO data and Rabobank Analysis

2.4. India's share in global trade

Given the perishable nature of milk, only 7 % of world production is traded (excluding intra-EU trade). Dairy products traded in the world market include butter and milk fats, cheese, condensed milk, whey, casein and ingredients. Share of liquid milk is restricted to UHT milk in small quantities from Australia to South East Asia. The relative size of world trade in key dairy products is depicted in the following table.

Exhibit 2.4.A: Global trade in dairy products				
				Figures in mn MT
Product	Intra EU Trade	World Trade	World Production	World Trade as % of Production
Liquid milk, retail pack	1.7	< 0.5	> 100	< 0.5%
Cream, retail pack	0.1	0.1	~ 5	~2%
Yogurt, fermented milk	0.75	0.4-0.5	~ 15	~3%
Cheese	1.8	1.1-1.2	15	7-8%
Condensed milk, retail pack.	0.2	0.5-0.6	4	10-15%
Butter	0.6	0.8-0.9	6.5	10-15%
Whole milk powder	0.25	~1.3	2.5	50%
Skim milk powder	0.5	~1	3.5	30%

Source: CFCE / IDF, Rabobank International

The key surplus and deficit regions, along with the major dairy products imported by the region, are depicted below.

Exhibit 2.4.B: Sufficiency level in milk		
Milk Sufficiency	Region	Sufficiency Level
Milk Surplus	Oceania (Australia + New Zealand)	300%
	Western Europe	110%
Milk Sufficient	South Asia	100%
	CIS	100%
Milk Deficit	South America	95%
	Central America	80%
	Africa	65%
	South East Asia	65%
	Middle East	55%

Source: Rabobank International

Both Oceania (Australia and New Zealand) and EU are surplus regions and dominate world exports with Asia, North America and Middle East being the key importers. The EU played a dominant role in world dairy trade but its share has been declining in recent years, on the back of reduction in subsidies. The shift in market shares in world dairy trade are listed below:

Exhibit 2.4.C - Global market shares in milk equivalents		
% of volume	1999	2002
EU-15	36	29
Rest of Europe	11	11
New Zealand	22	29
Australia	16	18
USA	6	4
Argentina	5	4
Rest of World	4	5

Source: Dutch Dairy Board, Rabobank, 2004

India's exports have an insignificant share in global dairy trade (< 1 %) despite India being the largest milk producer.

Exhibit 2.4.D: Exports of dairy products			
Figures in USD Million			
Year	World	India	India's Share in Global Trade
1998	26,752	4	0.02%
1999	25,417	11	0.04%
2000	25,333	23	0.09%
2001	26,742	42	0.16%
2002	25,922	26	0.10%
CAGR	-1%	58%	

Source: FAO

India has two distinct competitive advantages, which can be leveraged to enhance exports.

A. Low farm gate prices

Amongst the important milk producing countries; Argentina, New Zealand and Australia have slightly lower farm gate prices than India, but these account for only 10% of global milk production.

Exhibit 2.4.E: Competitiveness at farm gate		
Countries	Share in Production	Farm Gate Prices /100 Kg (US \$)
Ukraine / Belarus	3%	< 10
Zimbabwe	1%	11
Poland, Argentina, Latvia	4%	13-14
Australia, New Zealand, South Africa, Estonia	5%	16-17
India	15%	19-23
Czech Republic, Hungary	1%	19-23
EU, USA, Croatia	35%	38
Japan	1%	60

Source: ZMP / IDF, Rabobank International

B. Proximity to milk deficit markets

India has a locational advantage to serve milk deficit areas in neighboring countries. The markets and their import dependence is as follows:

Exhibit 2.4.F: Milk production and share of imported milk and milk products		
Countries	Milk Production (000' tonnes)	Share of imported milk (%)
Bangladesh	NA	40
Indonesia	498	40
Malaysia	39	95
Philippines	10	97
South Korea	NA	97
Sri Lanka	NA	65
Thailand	480	79

Source: "Dairy India". Publisher: Dairy India Yearbook, New Delhi.

In addition, demand for milk products in these markets is expected to be strong.

Exhibit 2.4.G: Growth forecast (2003-07)		
	South East Asia (%)	South Asia (%)
Liquid Milk	5	2
Fresh Products	10	10
Cheese	5	5
Butter	3	2
Skimmed Milk Powder	10	10
Whole Milk Powder	10	5

Source: Rabobank

However, India is not able to capitalize on these advantages due to the following reasons:

- low quality and hygiene standards
- lack of experience marketing products in international markets
- Significant growth in consumption of milk products in the domestic market leading to limited surplus for exports

The opportunity for India to participate in world trade is set to become very attractive. As per the new regulations, the US will have to grant increased market access for butter, cheese and skim milk powder, while export subsidies for butter will be reduced. Similarly, the EU will have to reduce its subsidized exports of cheese and meet production deficit through imports. New Zealand, Australia and Argentina are already capitalizing on the opportunities emerging from the increase in market access required by the WTO.

India needs to develop competitiveness in products which are being imported by markets such as China, Japan and Thailand. These products include skimmed milk powder and butter oil. In addition, a potential product is whey powder, which is used as a feed ingredient. Also the importance of value-added whey products for high-end food and non-food applications is growing.

To achieve these objectives, India needs to have a consistent exportable surplus and meet quality requirements of importing nations

2.5 Vision, strategy and action plan

The vision for the dairy sector entails

- Increase in level of processing to 30%
- Enhanced commercialization of ethnic Indian products
- Increase in India's share in global trade

Backed by

- Enhance sufficiency level in milk production

The strategy to achieve the stated vision is summarized below:

	Increase level of processing	Enhance commercialization of Indian ethnic milk products	Increase share in exports	Enhance sufficiency level in milk production
Increase productivity / ensure milk availability	☐			☐
Promote hygienic production of milk at farm level	☐		☐	☐
Preserve and improve quality of milk in the milk value chain	☐		☐	
Promote milk testing at village level	☐		☐	
R & D for developing machinery / processes for large scale manufacturing		☐		
Develop packaging solutions for enhancing shelf life, particularly for ethnic dairy products Focused market/product approach for increasing exports		☐	☐ ☐	

The short-term and long-term action plan for the Central and for the State governments is as follows:

Central Government	<ul style="list-style-type: none"> • Training of unorganized sector • Offer financing schemes through nodal agencies to promote bulk cooling and storage • Promotion of dairy exports in milk deficit markets • Catalyse R & D for commercialization of indigenous products • Zero excise duty on all milk products • Impetus on research and extension for livestock development and improving productivity of milch animals
State Government	<ul style="list-style-type: none"> • Develop milk testing infrastructure at village level • Nil indirect taxes on milk products (sales tax, octroi etc.) • Impetus on research and extension for livestock development and improving

1. Training of the unorganized sector

Training of the unorganized sector on food standards, testing, cost-efficient processes etc. is required to upgrade their level of operations. Small manufacturers of indigenous products, such as halwais, need to be trained to adopt hygienic practices for quality improvement. The state / district level bodies, cooperatives, ITI's can be involved in such efforts.

2. Impetus on research and extension for livestock development and improving productivity of milch animals

The Central Government, together with State Governments needs to develop time-bound programmes for improvement in productivity through the following measures:

- Expand coverage of artificial insemination
- Take up genetic improvement programmes in selected milksheds to supply semen of evaluated bulls to all milksheds
- Create first-aid facilities in DCSs
- Create Disease-free Zones
- Incentivise investment in production of cattle feed

3. R & D for commercialization of indigenous dairy products

Commercialization requires development of mechanized systems and continuous packaging machines. It requires collaborative efforts of the industry, the unorganized sector, machinery manufacturers and R & D institutions. In this context, an apex research institute (Refer Volume 1, Chapter 8) could play a key role in coordinating such research. Further, the Government could develop specific schemes to incentivise investments of such machinery through specific financing schemes for investment in such machinery.

4. Promoting dairy exports in milk deficit countries

India should focus primarily on markets in South East Asia, Middle East and Africa, which are milk deficit. Majority of countries in these regions import skimmed milk powder and butter oil, however there is competition from EU and Australia New Zealand in these commodities. Cost competitiveness along with aggressive promotions would be required to make a dent into these markets. The Ministry of Food Processing, in conjunction with the NDDDB, needs to undertake generic promotional campaigns to enhance the image of Indian dairy-based products in these markets.

5. Develop milk testing infrastructure at village level

Milk testing infrastructure needs to be upgraded from measuring only "fat content" to measuring fat, SNF content, bacterial count, heavy metals, pesticides residue somatic cell count etc. Quick tests need to be developed to assess presence of contaminants in milk at farm level. These parameters should be monitored and recorded to assist processors in grading and making payments to producers on the basis of overall milk quality. Government should standardize the quality control mechanism and make it mandatory for dairy companies to comply with these. Government should incentivise processors to invest in quality control infrastructure. The incentive can be in the form of tax rebate or subsidy.

6. Promote bulk cooling and storage

Companies need to be incentivised to install bulk coolers / chilling centres for procuring milk. The Government can announce specific financing schemes to part-fund these investments.

7. Zero indirect taxes on milk & milk products

This is an important measure required to enhance affordability of dairy products, as also incentivise processors to invest in market development.

The organized dairy segment has the potential to grow to INR 2756 bn, on the back of volume growth, value addition together with an enhanced product mix.

Exhibit 2.5 A: Market potential and investment																	
	Current market Size / Growth					Market Size / Growth for 2012 and 2015					Capacity required			Investment required			
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)	Current capacity (Tonnes/day) & Utilization(%)	New capacity required (2005-10) Tonnes/day	New capacity required (2010-15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2015-15) (INR Million)	Total investment (2005-15) (INR Million)
Production	91			4%		116		141		4%	4%						
Processed																	
Organised	11		254000	8%		29	1212000	42	2755974	15%	8%	73970	86866	40437	217165	101091	318257
Liquid Milk	8	12250	98000			16	224000	22	308000	13%	7%						
Milk Products	5	31200	15600		10%	13	988000	20	2447974	18%	9%						
Unorganised (milk products)	22	41182	906000	5%		28	1274833	36	1627046	5%	5%						
Total processed	33		1160000			57	2486833	78	4383020								
Share pf Processed (%)	35%																
Organised	13%					25%		30%				50%	60%	70%			
Unorganised	22%																

Capacity utilization is expected to increase to 60% in 2010 and 70% in 2015. Additional capacity creation will require investment of INR 217 bn until 2010 and INR 101 bn in the period 2010-15.

Edible Oils

3.1 Overview

The size of the Indian oilseeds-based sector is estimated at INR 610 Bn (inclusive of export/imports). India is the world's fourth largest vegetable oil economy with 15,000 oil mills, 600 solvent extraction units, 230 vanaspati (hydrogenated oil) plants, and over 500 refineries, employing over one million persons.

India is a leading player in edible oils, being the second largest importer next to China and the third largest consumer after China and the EU. Each year, India consumes around 11 million tonnes of edible oils. Although edible oils are widely consumed, by over 90% of Indian households, the per capita consumption of edible oils is around 11 kg per year, considerably lower than in most developed countries. Palm oil (mainly imported) and soybean oil account for almost half of total edible oil consumption in India, followed by mustard oil and groundnut oil.

Regional consumer preferences for certain oils are led mainly by the oilseed crop cultivated locally (mustard/rapeseed in the north and east, groundnut in the west, soybean in the north, coconut oil in the south). The price of edible oils is the key driver of demand. In India, a large proportion of edible oil is sold as loose oil or vanaspati (partially hydrogenated vegetable oil). Only a small percentage of edible oils are sold in branded form.

Together, groundnut, soybean and rapeseed/mustard account for over 80% of the output of cultivated oilseeds in India. Domestic price support policies have favoured the production of crops that compete with oilseeds, such as rice and wheat, resulting in waning oilseed production. Efficiency gains in the oilseed-processing sector have also been hampered by poor infrastructure and policies restricting economies of scale in processing plants. Domestic edible oil production (5 to 6 million tonnes) is not sufficient to meet domestic demand. The trade policy reforms in the mid 1990s fuelled the increase in edible oil imports, which now meet 40-45% of India's consumption requirements. India will continue to depend on imports in the future, mainly of crude palm oil/palmolein and crude soybean oil, as these have been the lowest-price options.

3.2. Demand of edible oils

3.2.1 Edible oils - consumer demand estimation

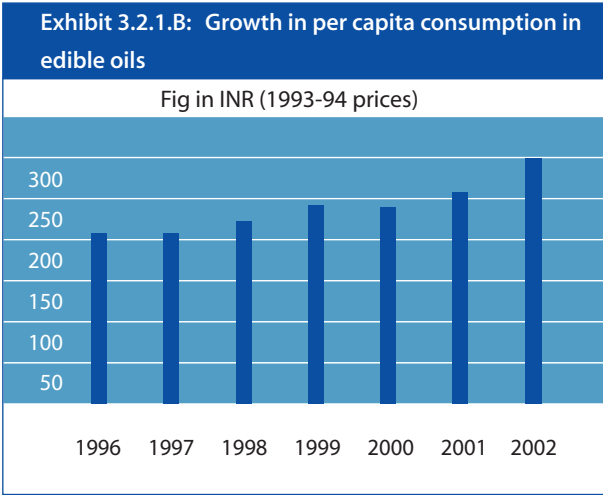
Consumer demand for edible oils is estimated at INR 300 bn (at 1993-94) prices, growing at a CAGR of 6.4%. Population growth accounts for 1.9% of this growth, while the remaining 4.5% is due to increase in per capita expenditure on oils.

Exhibit 3.2.1.A: Growth in consumer demand of edible oils

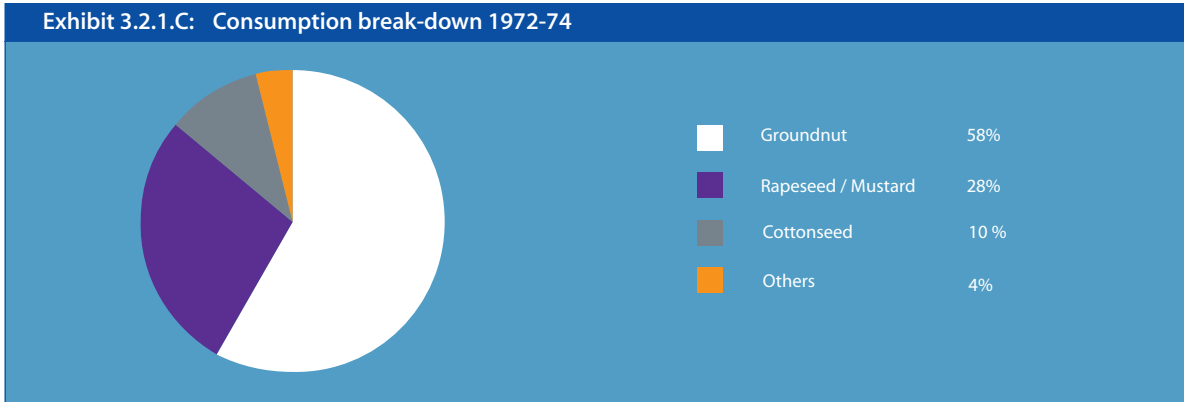
Fig in INR Bn (1993-94 prices)

Year	Population in Million	Per capita expenditure (INR)
1996	934	219
1997	950	217
1998	966	228
1999	981	247
2000	997	230
2001	1027	248
2002	1043	286
CAGR	1.9%	4.5%

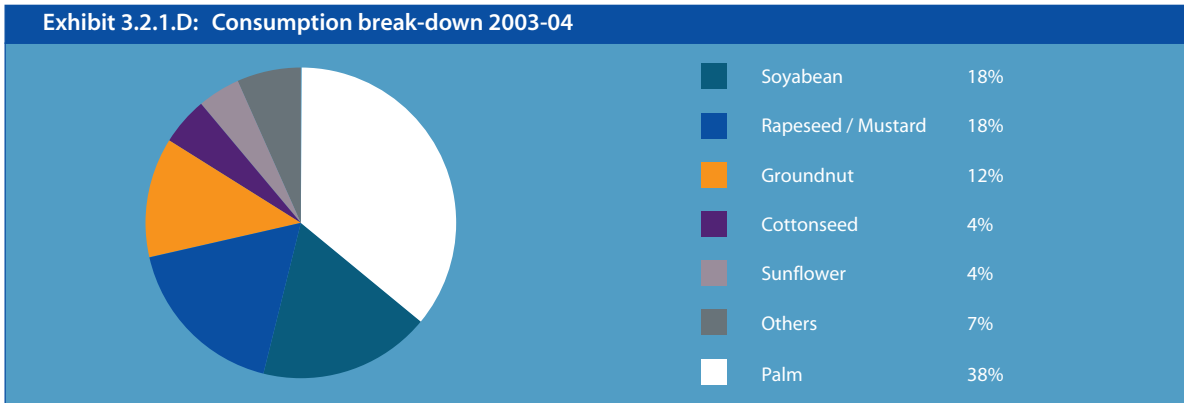
Source: NSSO data, Rabobank



Source: NSSO data, Rabobank



Total consumption 2.29 Million tonnes • Source: USDA

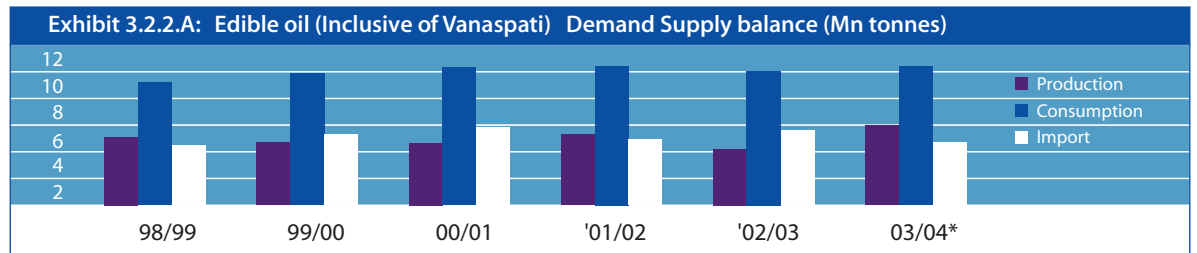


Total consumption 10.4 Million tonnes • Source: Oil World, 2004

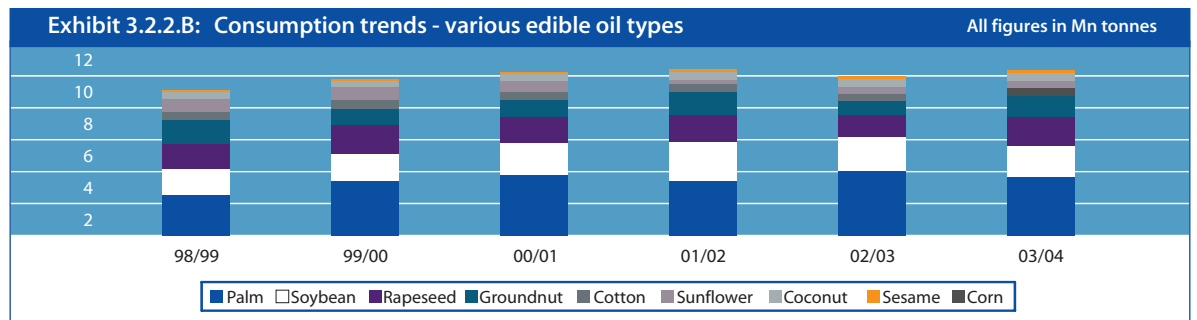
The strong growth of palm and soybean oil imports and their rising share in consumption reflects the sensitivity of Indian consumers to prices.

3.2.2 Changing consumer preferences

The changing consumer preferences are depicted in the following graphs:

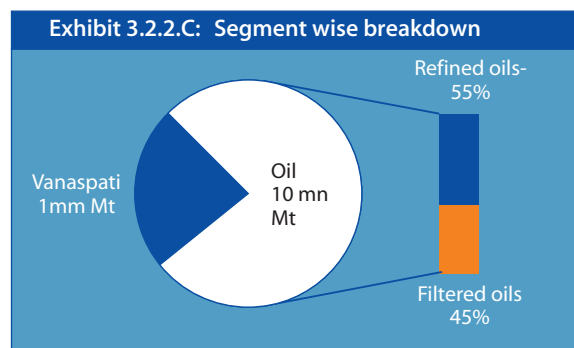


Source Oil World 2004

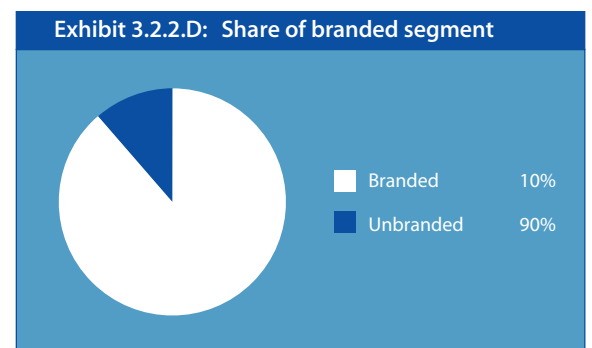


Source : Oil World 2004

With the steady growth in population and personal income, edible oil consumption volumes experienced a growth of 4% in the period from 1998-99 to 2001-02 - Refer Exhibit 3.2.2 (B).



Source: Rabobank research



Source: Rabobank research

The market value of branded edible oils is INR 50 bn and has been growing at a CAGR of 7-8% over the last five years. Branded edible oils account for 9% of the total edible oil market by volume. 16% (29 million) of households in India consume branded edible oils, thus presenting a huge untapped opportunity for edible oil marketers. A large proportion of households consume both branded and unbranded oils. Branded edible oils have penetrated 31% (17 million) of households in urban areas, yet only 9% (12 million) of households in rural areas. Among branded oils, refined oils account for 60% of consumption and filtered oils account for the balance. Mustard oil, sunflower oil and groundnut oil together account for around 80% of branded edible oil consumption. However, soybean oil is rapidly gaining share from these oils, on account of more favourable prices.

A. Movement to cheaper oils

The price of edible oils is the biggest driver for consumption. There has been a continuous shift to cheaper oils such as palm oil and soybean oil. Even within the branded segment, growth is being driven by brands in the lower priced bands.

B. Slow and steady shift to packaged and branded oil

With instances of adulteration being reported almost every year, in the unbranded loose oil category, a gradual but steady shift towards packaged and branded oil has been taking place in recent years, mainly in urban areas. Lighter and refined oils are perceived to be healthy.

- Differentiated offerings on the health plank - Health is an emerging demand driver in India. Until a few years ago, it was not an often used marketing proposition by edible oil companies. However, in the last three years, there have been increasing efforts to position products as differentiated offerings. 'Low Absorb' property, 'Freshness Intact Technology' (FIT), benefits of Omega 3, are some of the attributes highlighted by companies to differentiate their products. Doctors' recommendations (general practitioners, dieticians, heart specialists) have also started playing a role in determining consumer preferences.
- Blended oils - Companies are launching blended oils, combining the health benefits of two types of oils. e.g. a blend of Sunflower oil and Ricebran oil in the ratio 20:80.
- Innovative packaging - Branded players have attempted to deliver better value for money through improved packaging. Tetra packs, easy-to-pour pouches, taps on 15-litre containers and transparent pouches are some of the packaging innovations being used by major players.

Exhibit 3.2.2.E: Trends in branded edible oil segment	
Type of oil	Key trends
Soybean	This is the fastest-growing segment in branded edible oils. In volume terms, its share among refined branded oils grew from 6% in 2000 to 29% in 2003, on account of its attractive pricing with respect to sunflower oil. (Less than INR 50 for a one-litre pack). Soybean oil has gained share from both sunflower oil and mustard oil. Soybean oil consumption is on the rise in the north and the east and is gradually gaining share in the west and the south.
Sunflower	Sunflower oil has the highest share among refined branded oils. It is considered a light and healthy cooking medium. Its growth in the 1990s was due to wide availability and attractive pricing compared to groundnut oil. The import duty hike on sunflower oil in 2001, led to a significant consumer shift towards cheaper oils like soybean. Its share among refined branded oils declined from a high of 60% in 2000 to 42% in 2002.
Mustard	Consumers prefer mustard oil in filtered form ⁷ . The share of mustard oil among branded refined oils declined from around 10% in 2001 to 6% in 2003 mainly due to the fall in domestic oilseed production. The market is highly fragmented with a host of small players in the north and east.
Groundnut	Consumers prefer groundnut oil in filtered form. It is largely consumed in Western India. The segment has a large number of small players.
Olive	The consumption of olive oil (mainly imported) for cooking is negligible, with the high price of INR 350 (USD 7.6) per litre being a key deterrent to purchase. Usage is largely restricted to high income households
Blended oil	This segment has been gaining steadily in share over the last two years and currently accounts for around 6% of the refined oil segment. Some of the leading blended oils include Soybean + Sunflower, Ricebran + Sunflower, Ricebran + Safflower, Corn + Safflower etc.

Source: Rabobank research

3.2.3 Demand outlook

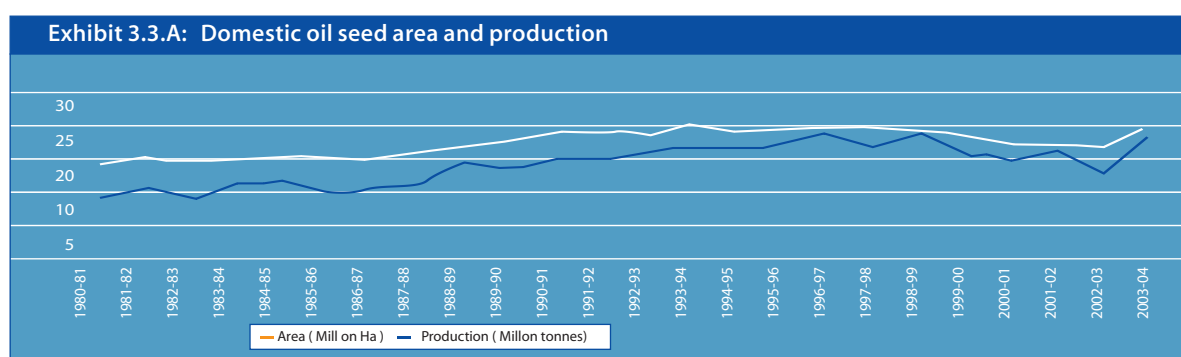
Edible oil demand is expected to grow by 5.5 to 6% per annum over the next ten years, which translates into consumption of 15.2 and 20.2 million tonnes by the end of 2010 and 2015 respectively.

Branded edible oil growth is expected to be significantly higher than overall sector growth. With increasing incomes and quality consciousness, the branded oil segment is expected to grow at 12% annually. Owing to its competitive pricing, soybean oil's share is likely to grow from its present 30% to 45% among branded refined oils within the next five years. Factors such as government policy, in terms of rationalisation of tax structure, and the implementation of the packaging order, should also influence the shift to branded oils.

⁷ Indian food laws allow the blending of only two oils. The pack label has to state the names and proportion of each oil. Each of the oils used for blending should be 20% of the total volume.

3.3. Oilseed production

Indian oilseed production is characterised by decreasing production and low yields. Domestic price support policies have tended to favour the production of crops that compete with oilseeds, such as rice and wheat. Oilseeds are grown mainly on marginal and sub-marginal lands under low input usage. Moreover, less than 25% of the oilseed area is irrigated, thus rendering oilseed production vulnerable to weather-related yield risks. This has resulted in decreasing oilseed production and low yields (see Exhibit 3.3 A). Indian oilseed yields are about half of the world average and almost one-third that of the leading producers in the world.



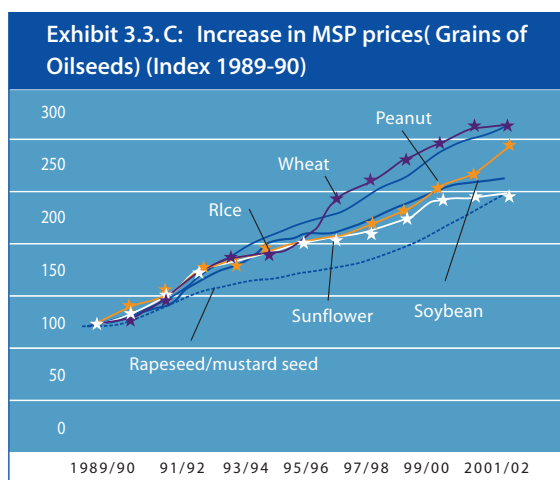
Agricultural statistics - Ministry of Agriculture
 Figures for 2002-03 and 2003-04 are best estimates

	India Yield	India Yield (Best State)	Yield World Average	Yield (Leading Producers)
Soybean	1.05	1.25 (Maharashtra)	2.27	2.25 (USA), 2.80 (Brazil), 2.85 (Argentina)
Rapeseed / Mustard	0.76	1.49 (Haryana)	1.52	1.6 (China), 1.42 (Canada), 2.87 (Germany)
Groundnut	0.94	1.72 (Tamil Nadu)	1.40	2.98 (China), 0.97 (Nigeria), 3.5 (USA)

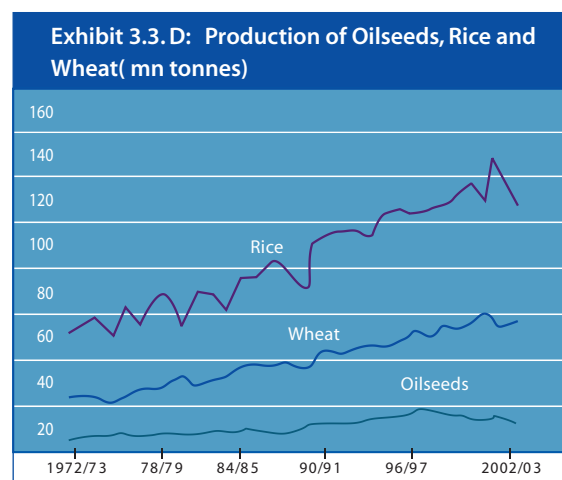
Source: FAO, Agricultural Statistics (2003) Ministry of Agriculture

One factor which has contributed to insufficient domestic supply of oilseeds is India's Minimum Support Price (MSP) program which has often favored production of crops that compete for area with oilseeds. As part of the Technology Mission on Oilseeds (TMO) program, the Government attempted to boost oilseed production in the late 1980s and early 1990s. During that time, MSPs for grains were kept in check, relative to oilseeds and the government-controlled import monopoly dramatically lowered oil imports. This contributed to a sharp improvement in oilseed prices relative to competing crops and a 70% increase in oilseed production between 1987-88 (14 million tonnes) and 1994-95 (24 million tonnes). Beginning in the late 1990s, however, oilseed prices have declined relative to other crops, initially in response to the increase in domestic oilseed supplies

and subsequently due to the liberalization of edible oil imports initiated in 1994. MSP levels for grains have also been raised more than for oilseeds since the mid-1990s (Refer Exhibit 3.3 C).



Source: Ministry of Agriculture, Government of India



Source: Ministry of Agriculture, Government of India

Increasingly favorable returns in wheat and rice have led to decline in oilseed acreage, thus lowering oilseed production from an average of 26 million tones annually in 1994-95 to 23 million tonnes in 2001-02 (Refer Exhibit 3.3.D).

3.3.1 Solution themes

A) Increasing oilseed yields

Increase the average oilseed yields from 1.07 tonnes/ha (2004) to 1.4 tonnes /ha by 2015 by

- Increasing the area under irrigation/prospective irrigation in oilseeds from the present 23.2% (1998-99) to 30% (2006-07).
- Developing high yielding, early maturing and pest /disease resistant varieties of oilseeds with higher oil content suitable for different agro climatic zones of the country
- Encourage private sector participation and direct farmer processor linkages. This would ensure adoption of superior crop management practices and resulting offtake arrangements.
- Better crop management is possible through
 - Ensuring adequate supply of quality seed (certified) of annual oilseeds to achieve a seed replacement ratio of 15-20% from the present level of 6-9%.
 - Integrated nutrient management with emphasis on bio-fertilizers, sulphur.
 - Usage of micro-nutrients
 - Integrated management of key pests and diseases to enhance oilseeds productivity in different agro-ecologies.
 - Selective mechanization (e.g. improved planters, groundnut digger and decorticator, safflower harvester, scotching machine for linseed etc.) to improve efficiency in oilseeds production.

Exhibit 3.3.E: Frontline demonstration (FLD) by Soybean Oil Processors Association (SOPA) in association with ICAR (2003)

Objectives - To demonstrate the impact of recommended production technology including new varieties on productivity, on farmers fields

Materials & Methods - A cluster of farmers in 16 villages were identified within a radius of 40-60 km from SOPA's R&D center at Indore, Dewas and Ujjain districts. 100 farmers with varied size of land holdings and economic status were selected in these villages. An area of 1 acre of land was utilized for the FLD and the farmers were advised to follow the recommended package of practices including deep ploughing (10-12") in the month of April/May. The fields were prepared for sowing by June.

Package of Agronomic Practices - Appropriate production technology as standardized by AICRP* on soybean and recommended by NRCS was followed. The seed was treated with Bitavax power 3 g. per 1kg seed and Rhizobium and PSB cultures. A basal dose of NPK @ 20:60:20 kg/ha was applied in the form of urea, SSP & murate of potash prior to final seed bed preparation. The seeds were planted @30 kg/acre. Soybean varieties used for FLD were JS-335, Pusa-16, NRC-12 & PK-1024. Row to row spacing was kept at 45 cm. The seed was planted both by using tractor-drawn seed drill and bullock-drawn local seed drill.

General Crop Condition - The germination was satisfactory in different FLDs. Post sowing, there was intermittent light to heavy rainfall during the entire period of crop growth.

Weed Management - The farmers managed the weeding manually with no weedicide being used in the FLD plots during the period of crop growth.

Insects, Pests & Diseases - There was heavy infestation of pests namely, - Blue beetle, Girdle beetle, Semilooper, during the period of crop growth. Due to timely use of insecticides, there was no damage to the soybean crop in FLD plots. However, in the case of farmers who had not used timely plant protection measures, there was significant crop damage.

Harvesting - An area of two square meters from five randomly selected sites within each FLD of one acre was manually harvested, the material was hand threshed, the yield of soybean from each of the sample sites was recorded and the yield for one acre was computed. The same procedure was adopted for computing the yield in the plot planted by the farmer as per conventional practices.

Results:

Yield - The maximum, minimum and mean yield (tonnes/ha) with improved technology was 3.84, 1.58 and 2.30 respectively; while under farmers' condition it was 2.37, 1.20 and 1.78 respectively.

Varietal performance in Grain Yield - The variety JS-335 with improved technology had the highest yield followed by Pusa-16, however varieties NRC-12 and PK 1024 had comparatively low yields

Germination and plant population - The germination of the crop was normal for all varieties under improved technology conditions. A higher degree of insect and pest infestation was observed in the crop under farmers' conditions, due to higher seed rate and thicker plant population. The infestation of soil borne disease infestation was minimized due to deep soil ploughing in summer. The intermittent rain enabled manual intercultural operations.

Insect and pests - A severe insect infestation (Blue beetle, Girdle beetle and Semi lopper) occurred during the month of July. It was observed that 5-10% of the crop was damaged in most of the areas where control measures were not taken appropriately. The Semi lopper had damaged all the reproductive parts of the plant. Moreover, the control measures against the Girdle beetle, which attacked in vast numbers during the late stages of growth, were not very effective.

Yield Performance - A yield improvement of 25-30% was obtained in FLD plots. Among the varieties JS-335 performed better as compared to other varieties. On an average, the yield of Pusa-16 was on par with JS 335. However, PK-1024 and NRC-12 had lower yields.

Other Activities - A field day was organized at 7 villages viz., Dudhiya, Tillore, Navdapant, Khakrod, Palkhanda, Narana, and Tokkala. The field day was attended by nearly 150 farmers and scientists from NRCS, Indore and representatives of various input companies.

Source - SOPA

B) Increasing area under oilseeds

Since the relative yields and economics are superior for wheat and rice than oilseeds (under the current MSP regime), it would be difficult to shift large areas under these crops to oilseeds. However, the following measures would lead to some shift from these and other grains to oilseeds:

- Diversification in existing cropping systems such as rice-wheat and sugarcane, crop intensification in rice-fallow situations and introduction of oilseeds such as sunflower, as an intercrop with widely spaced crops like pigeon pea, sugarcane, cotton and maize.
- More efficient and effective use of available water resources. e.g. preference to cultivate oilseed crops in tail end of canals and in areas irrigated by wells and tanks where water availability is limited, instead of crops like rice, wheat and sugarcane, which require more water; and in saline areas.
- Providing policy back-up to support diversification to oilseeds, through effective input and price support (rather than cash incentive) and import interventions. The system of MSP followed in India imposes the burden of subsidy provided to farmers/growers on the processor and the eventual consumer, besides leading to price distortion vis-à-vis international prices. At the same time, State Agencies carrying out such operations are burdened with stocks, leading to wastages and an inefficient market. The farmer could have the option of selling his goods in the market and claiming a subsidy from the Government equivalent to the Support Price less the Market price. Processors would purchase the oilseeds at the market price.
- Develop warehouse receipt based financing, which would allow farmers to store the output and sell it at favourable prices. (Refer Volume 1 Chapter 5 - Finance for food processing companies)

C) Leverage potential of tree borne oilseeds

India has realizable potential of about 3.5 million tonnes of Tree Borne Oilseeds (TBOs) like sal, mango kernel, mahua, neem, karanja, jojoba, chura, kokum, kusum, tung etc. which are being grown in the forest and non-forest areas. However, less than 20% of the existing potential is tapped and utilised due to lack of awareness, poor collection facilities and marketing network.

The oils and fats recovered from these TBOs are used for making industrial products like cocoa butter equivalents, soaps, lubricants, paints, varnishes, bio-diesel, hair oils, cosmetics and medicines. Vegetable fats obtained from sal, mango kernel, kokum, dhupa etc. are used as cocoa butter equivalents in the chocolate

industry. Neem and karanja cakes are used as manure with pesticidal properties. De-oiled meals of sal and mahua are used as cattle feed. Promotion and development of TBOs would enable conservation of the ecological balance, generating employment in tribal areas and expanding and uplifting rural and cottage industries.

Therefore the Government needs to take steps to augment the availability of vegetable oils from tree borne oilseeds from 0.15 million tonnes to 0.30 million tonnes by increasing existing collections, and through establishment of compact plantations of tree borne oilseeds in wasteland and other lands, to cover an area of 0.15 mn ha by 2010 and 0.25 mn ha by 2015. Direct farmer processor linkages could be an effective catalyst for achieving the above.

There is a growing trend among international chocolate manufacturers, to use TBOs fats such as Shea and Illepe from Western Africa/Indonesia. This highlights the opportunity to enhance value addition to Indian TBOs by developing these oilseed-based fats for usage in chocolates.

D) Leverage potential of rice bran oil

Rice Bran Oil is obtained from the outer brown layer of rice. That it is a 'Heart Friendly - Health Oil' with following unique properties beneficial for maintaining good health, is corroborated by Research Institutes in India (NIN - Hyderabad, CFTRI Mysore, CSIR - New Delhi) and overseas.

India is the second largest producer of rice in the world next to China, with potential to produce about 1 million tonne of Rice Bran Oil per annum. Currently, the industry is processing about 3.5 million tonnes of Rice Bran leading to a production of about 0.65 million tonnes, of which 0.60 million tonnes is of edible grade. An additional 0.33 million tonnes could be produced. This would require modernizing of huller rice mills and installation of Rice Bran oil refineries. This would result in reduction in broken rice, separation of husk and bran with the latter available for commercial use as raw material, for solvent extraction of rice bran oil.

E) Focused efforts on oil palm cultivation

The area under Oil Palm is estimated at 40,000 hectares, of which Andhra Pradesh accounts for 30,000 hectares. There are over 40000 oil palm growers in India. As per industry sources, the annual Crude Palm Oil (CPO) production in India is 30000-35000 tonnes annually.

The price paid for Fresh Fruit Bunches (FFB) to growers is determined by the respective state governments, based on International CPO prices and is reviewed once in three months. A decline in international CPO prices leads to a sharp decline in FFB prices as well. Of the 62,600 ha of oil plantation raised in the country until the end of the IX plan, more than 20,000 ha of plantations were uprooted as farmers did not get remunerative prices for FFB due to crash in CPO prices. The Government had to intervene by operating a minimum price guarantee scheme to restore their confidence.

⁹ Data from Central Organisation of Oil Industry and Trade (COOIT)

Exhibit 3.3.G - India Oil Palm cultivation and CPO production Economics

Scenario 1 - CPO realization of INR 30 / kg leading to an FFB realization of INR 3375 per tonne

Scenario 2 - CPO realization of INR 20 / kg leading to an FFB realization of INR 2250 per tonne

Oil Palm grower			Processor		
	Scenario 1	Scenario 2		Scenario 1	Scenario 2
Cost per acre per year - INR 10000 (Irrigation / Power/Fertilizer/ Harvesting etc) Yield per acre 6 tonnes			Costs per tonne of FFB	INR	INR
			Purchase price of FFB	3375	2250
			Transportation cost		
			Processing cost for CPO	300	300
			Purchase tax (4% of FFB)	450	450
			TOTAL COST	160	100
			(incl misc expenses)	4300	3150
Price realized / tonne	INR	INR			
Total Realization / acre	3375	2250			
Net Earning per acre	20250	13500			
	10250	3500			
			Realization / kg	INR	INR
			CPO	30	20
			Palm Kernel	13	8
			Total Realization (per tonne of FFB processed)	6050	4050

Source Rabobank research

As seen in Exhibit 3.3.G, a reduction in FFB prices has a sharper impact on the net earnings of the grower as compared to the processor. This could lead to reluctance from farmers to shift to oil palm.

It is recommended that the area under oil palm cultivation is increased to 200,000 ha by 2015 with major focus in Andhra Pradesh, Karnataka and Tamil Nadu, in order to enhance local production,

- A safety net for farmers in an industry downturn is critical. A Price Stabilization fund is recommended to protect farmers from declines in FFB prices below certain levels due to sharp falls in international prices of palm oil.
- Farmers are reluctant to shift to oil palm due to the long gestation period (4-5 years). Therefore, the following measures are recommended:
 - Promoting intercropping (Banana, Maize, Chillies and Vegetables in the first three years), to make oil palm plantation more sustainable and economically viable.
 - The government currently provides a subsidy of INR 45 / sapling x 143 saplings / ha = INR 6345. Besides this INR 15000 is provided over a 3-year period for cultivation costs. This should be continued.
 - Minimum support price for Oil Palm FFB to be declared by Government of India
- The Government should periodically cross check the rate of recovery from FFB quoted by processors, since there is a tendency to quote a reduced recovery, so that a lower FFB price is calculated for the farmers.

3.4. Processing sector

India's processing sector can be categorized into ghanis, small scale expellers, solvent extractors and oil refiners. The key characteristics of each of these segments is provided below:

Exhibit 3.4.A: Oilseed processing sector in India	
Ghanis	Ghanis (about 130,000 units) are oilseed crushers covered by SSI policies. Ghanis are small traditional (cottage industry) crushers, mainly in rural areas. They have an average output of about 60 kg per day and account for less than 5 percent of industry output.
Small scale expellers	Small-scale expellers (about 15,000 units) are relatively modern facilities, as compared to ghanis, with a daily production of up to the 10-ton daily limit set by SSI policies. They account for about 58 percent of domestic edible oil output.
Solvent extractors	They crush and process "hard" oilseeds with low-oil content such as soybeans and cottonseedas well as chemically extract residual oil from the oilcake processed by SSI crushers. This sector represents a growing share of the domestic supply of edible oils and is becoming more concentrated. Solvent extractors are not within the purview of SSI capacity ceilings.
Oil Refiners	These are a small but growing segment of the processing sector. These plants refine solvent-extracted oil. However, oil refiners are usually not integrated with solvent extraction and expeller plants, as is often the case in other countries.

Industry sources

In many countries (EU, USA, China), the three distinct processing operations crushing and expelling (separating oil from the solids), solvent extraction (to chemically remove residual oil from the oilcake solids), and oil refining are conducted by one vertically integrated plant. In India, only a small share of oilseed production undergoes solvent extraction and oil refining. Moreover, the scale of operations is much larger internationally. The typical refining capacity is in the range of 3000-4000 tpd, while in India there are only few refineries with a capacity of 1000 tpd.

Exhibit 3.4.B: Processing capacity and utilization (2002-03)			
Type of Vegetable Oil Industry	No of Units (Million tonnes)	Annual Capacity Utilization	Capacity
Oilseed Crushing Units#	150000	42.5 (in terms of seed)	10-30%
Solvent Extraction Units	633	27.4 (in terms of oil bearing material)	34%
Refineries (Total)	1000	10.2	40%
• Refineries Attached with Vanaspati	68	2.1 (in terms of oil)	54%
• Refineries Attached with Solvent Extraction Plant	265	4.4 (in terms of oil)	27%
• Independent Refineries #	667	3.7 (in terms of oil)	36%
Vanaspati units	235	4.4 (in terms of Veg Oil Products)	33%

Source Directorate of Vanaspati, Vegetable oils and Fats

- These are estimates as no precise figures about oilseed crushing units and independent refineries are available

3.4.1 The entry of international companies in the Indian edible oil sector

A large number of international companies have set up operations in India (especially in the last 3-4 years), either through port based refineries, trading subsidiaries or through brand acquisitions. Port-based refineries with capacities of 1000 tpd, are being set up to import crude oil, refine and distribute for local consumption. These companies are aiming to leverage their global strengths in terms of better technology and economies of scale.

Wilmar, the largest palm oil conglomerate in the region, already owns one of India's largest oil refineries in collaboration with the Adani group. Bunge Agribusiness India, after buying the Dalda Vanaspati (Hydrogenated Vegetable oil) brand from Hindustan Lever Ltd last year, plans to acquire more brands and refineries in India in the next two years. Cargill, which has a presence in the branded edible oil market, is also setting up two port-based refineries with refining capacity of 1000 tons per day. Imports of edible oils into India is the other attractive opportunity, given large volumes of imports (currently 4-4.5 Mn tonnes and likely to increase further).

Exhibit 3.4.C: The rationale for port based refineries	
Area	Advantage
Raw material	MNC players are likely to source oils from other countries where they have a sizeable presence. This reduces the cost of raw materials and improves their competitiveness.
Logistics	Port-based refineries reduce freight and make the handling of imported crude easier. Moreover, due to the higher volumes, refined oil can be transported by rail, which is cheaper than road transport.
Processing	The refining and packaging costs are lower due to economies of scale
Others	The duty differential between crude and refined oils makes it advantageous to import crude oil and refine it in India. Port-based refineries also enjoy tax concessions for a few years in certain states.

Source: Rabo India research

Exhibit 3.4.D: Advantage of scale in port based refineries - indicative costs for soybean oil (SBO)					
Description	SBO 50TPD (Bulk)	SBO 100TPD (Bulk)	SBO 200 TPD (Bulk)	SBO 500 TPD (Bulk)	SBO 1000 TPD (Bulk)
Capital Cost (INR Million)	62	95	134	230	375
Estimated Annual Prodn (Tonnes)@ 85% utilization	15513	31025	62050	155125	310250
[(Int + Dep) @ 20%] per Tonne	799	612	432	297	242
Manpower/ repairs/other Overheads (INR/Tonne)	300	200	125	65	30
Estimated Fixed Cost/Tonne (INR)	1099	812	557	362	272
Variable Cost/Tonne * (SBO)	650	600	550	510	480
% Process Loss @ 1% FFA (SBO)	3.20	3.20	3.20	3.20	3.20
Cost of Process Loss @ INR 30000/Tonne for SBO	992	992	992	992	992
Variable cost including process loss (SBO)	1642	1592	1542	1502	1472
Processing cost/tonne of SBO (INR)	2741	2404	2099	1863	1743

* - Based on Husk fired boiler, Source: Industry

3.4.2 Key issues in the processing of edible oils

A) SSI reservation for crushing of rapeseed/mustard, groundnut and safflower

Currently, crushing of groundnut, rapeseed/mustard, safflower and sunflower is reserved for the small scale sector. These constitute over two-thirds of the aggregate oilseed output of the country. This has translated into lack of significant investments in large, integrated processing plants and consequently, poor economies of scale in operations of existing players.

Derreservation of the sector would not only result in enhancement of productivity in processing, but also lead to an assured market for oilseed farmers. During the peak season, both large and small processors could source oilseeds from farmers. However, during the lean season, SSI units alone may be allowed to purchase oilseeds from farmers or from market yards. Derreservation would allow for crushing of seed and solvent extraction of cake to be carried out in the same complex, leading to increased recovery of oil. As per industry sources, due to economies of scale, the cost price for the final oil produced would be lower by 2%.

B) Capacity additions despite low capacity utilization

- Several State governments offer incentives to new units by exempting them from sales tax for a certain period, which renders manufacturing by old units (which have outlived the period of exemption) and competing units in other States (that may not offer such exemption) unviable. This has led to capacity additions despite industry-wide surplus capacity.
- There is over-investment by the industry, in terms of multi-oil configuration of assets, in the event of any changes in government policy, which can impact availability/prices of raw material.

C) Regulatory environment

- Food safety measures and adherence to quality standards are becoming increasingly important. In India, however consciousness about food quality and safety is not high. Issues such as aflatoxin in groundnut and cottonseed, as also glucosinolate in rapeseed / mustard need to be addressed, as they affect consumer health adversely and also impact export demand for derivatives (oilmeals).
- To address the issue of food safety, the Government promulgated the Edible Oil Packaging (Regulation) Order, 1998, a Central legislation. The salient features of this Order include the compulsory registration of packers, sale, distribution, despatch and delivery of edible oils in packed, marked and labeled form as specified. However, the responsibility of its implementation has been left to the various state Governments. Responding to vociferous protests from trade, most state Governments have postponed its implementation.

The Central Government should make it mandatory for all state governments to implement the Edible oil Packaging order. The manufacturers would be held accountable for the product quality. This would reduce the sale of adulterated oil, thereby providing superior products to end consumers.

- Changes required in the PFA regulations
 - PFA regulations do not allow blending of more than two oils. However, blending of multiple oils can address nutritional requirements (ideal fatty acid profile and inclusion of natural nutrients) of consumers more effectively, through the combined benefits of various oils.
 - PFA regulations do not allow the sale of blended oils in packed form, which weigh in excess of 5 kg. This restriction should be removed to ensure increased consumption of blended oils.
 - As per Article 37-D of the PFA regulations, a company cannot claim that an oil has functional properties e.g. it helps reduce cholesterol. In the recent past, research undertaken internationally has demonstrated that Oryzanol rich Ricebran oil, a high potential domestic species of oil, has such functional properties. PFA rules should be amended to allow genuine, clinically proven healthier alternatives to communicate their benefits, together with details of the entity which has endorsed these benefits. In addition, for refined rice bran oil, the PFA standards for unsaponifiable matter should be revised from 3.5% (max.) to 4.5% (max.) in line with international standards. This will ensure the presence of higher quantity of micro nutrients in the unsaponifiable matter.

D) Tax structure

As per industry sources, the current tax structure (Refer Exhibit 3.4.2.A), where the taxes are often higher than processor margins, often leads to evasion of tax (excise duty /sales tax). Further, it creates a non-level playing field for organized, branded players as compared to loose oil marketers. **It is recommended that there should be zero state level (indirect) taxation on edible oils.**

Exhibit 3.4.2.A: Analysis of cost card for input of 1 tonne of soybean (2004)		
Component	Unit / %	INR
Farmer - Mandi	per tonne	14000
Mandi Charges	1.60%	224
Commission agent	2%	280
Freight to Stockist		60
Cost to Stockist		14564
Stockist Margin	INR 4 / 90 kg bag	44.4
Broker Margin	INR 2 / 90 kg bag	22.2
Sales Tax	4%	582.6
Freight to Processor		50
Cost to Processor	per tonne	15263.2
Crushing cost	per tonne	750
TOTAL COST	per tonne	16013
Recovery		
Soymeal (kg)	82%	820
Refined oil (kg)	18%	180
Refining Cost	per tonne of oil refined	2500
Refining Cost	for 180 kg of oil	450
Total costs (including refining)	per tonne of seed	16463
Realization	per tonne of seed	17255
Margin	per tonne of seed	792
Refined oil (180 kg)	@ INR 44000 per tonne	7920
Excise duty	INR 1 per kg	180
Sales tax	4%	317
Refined oil (Net realization)	per tonne of seed	7423
Oil meal (820 kg)	@ INR 13000 per tonne	10660
Freight to port	@700 per tonne	574
Transit shortage	2%	213.2
Insurance/ Brokerage	INR 50 per tonne	41
Oil meal (Net Realization)	per tonne of seed	9832

Source: Rabo India research, industry

- The average processing margins in the edible industry are low (<5%). Therefore, the government should not provide any incentives, which create a non-level playing field for existing processors. For example, in the case of refined soybean oil, the processor's margin on a consumer price of INR. 50/kg is less than INR 2/kg. In such a scenario, an excise duty benefit of INR 1 per kg, provided by certain states, made the other processors

uncompetitive. The abolition of excise duty on both refined edible oils and vanaspati, announced in the Union Budget for 2005-06 would help create a level-playing field for all refiners and vanaspati makers irrespective of their location.

3.4.3 Vanaspati

Exhibit 3.4.3.A: Vanaspati trends capacity and production				
Year (Nov - Oct)	No of units	Capacity Million tonnes	Production Million tonnes	Capacity Utilization
1993-94	135	2.30	0.94	41%
1994-95	164	2.67	0.95	35%
1995-96	171	2.72	1.00	37%
1996-97	182	2.96	1.04	35%
1997-98	190	3.05	1.03	34%
1998-99	194	3.11	1.34	43%
1999-00	211	3.89	1.27	33%
2000-01	216	4.76	1.44	30%
2001-02	232	6.34	1.44	22%
2002-03	241	4.59	1.27	28%

Source Directorate of Vanaspati, IVPA

Issues facing the vanaspati sector

A) Adulteration of vanaspati with stearin

The production of stearin (non-edible fat) which is a by-product generated on fractionation of crude palm oil, is more than the consumption requirements of local soap manufacturers and therefore gets diverted as counterfeit vanaspati. It has a high melting point of over 52 degrees and is therefore highly injurious to health. Stearin can also be directly imported at a minimal concessional duty of 20% allowed to soap and detergent manufacturers. As per industry sources, this gets diverted and sold as vanaspati.

This challenge could be addressed through the following measures:

- Raise vigilance activity of inspection authorities of the Health Ministry (PFA Wing) and the Directorate of Vanaspati to ensure that appropriate raw material is used for manufacturing vanaspati.
- Raise the current customs duty on imported vanaspati from 30% to 90%, which is applicable on raw material and thereby also prevent the import of non-edible fat (stearin) from palm oil producing countries, where it is surplus and available in abundance

B) Free trade agreements (FTA)

There is a serious threat of imports from Sri Lanka and Bangladesh due to the concessional tariff accorded to them under the bilateral trade treaties signed with these countries (0% and 15% respectively). Vanaspati is made from CPO, which is imported at zero duties by Sri Lanka / Bangladesh from Malaysia / Indonesia, against the current duty of 80% for the Indian industry.

As per industry sources, the rules of origin under the Free trade Agreement between India and Sri Lanka, which state that the “products worked on or processed as a result of which total value of the materials, parts or produce originating from countries other than the contractual parties, used does not exceed 65% of the FOB value of the product produced or obtained” does not provide an adequate safeguard to determine the legitimacy of the imports. It can be easily manipulated to state that it is below 65% either by under-invoicing of imports or by inflating the various costs of manufacturing.

Therefore, FTAs need to keep in view the potential for creation of an uneven playing field for the domestic industry. e.g. a minimum value addition norm should be laid down to ensure that the landed price of imported oils through the FTA agreement, is not significantly lower than domestic prices.

C) Revision in the melting point specification as per PFA

The maximum melting point specified for vanaspati in India is 41 degrees celsius as against the internationally accepted norm (CODEX specifications) of 44 degrees celsius. The PFA norm is flouted by unethical manufacturers in India who are able to offer a relatively harder product to the consumer (preferred by the consumer) by using the stearin fraction of palm. This works to the disadvantage of ethical manufacturers, who follow the PFA norm. The PFA norms should be amended and the melting point specifications should be raised to internationally accepted norms. Alternately, there should be a strict enforcement of current norms to ensure a level playing field.

3.4.4 Oil meal

Soybeans are processed through solvent extraction at a cost of about INR 700 per tonne of seed. Typical soymeal yields are 82%. Soymeal is usually transported in bags through trucks and railway rakes to shipment ports, such as Jamnagar, Kandla, Vizag and Kakinada. The cost of transport to these ports, ranges from INR 700 to 900 per tonne of meal. The export prices are linked to international prices and CBOT. However, India has the advantage of lower freight to South Asia and the Far East. About 80% of domestic soymeal production (about 4.5 million tonnes in 2003-04) is exported. While exports will continue, the domestic market will also become attractive for domestic players, on the back of growth of the meat and poultry sectors and consequent demand for animal feed.

Exhibit 3.4.4.A Domestic consumption of soybean meal (million tonnes)	
Year	Consumption
1998-99	1.1
1999-00	1.2
2000-01	1.25
2001-02	1.3
2002-03	1.3

Source: SOPA

Though production of mustard seed is around 5 million tonnes, the oilcake is not entirely processed into meal. Exports of rapeseed meal are in the range of around 0.5 million tonnes every year. Groundnut and other meals are largely consumed locally. The industry has the potential to double exports in the next 3-5 years. In order to make Indian Soymeal price competitive in the global market, the following steps need to be undertaken:

- Soybean Meal needs to be classified and included in the “Vishesh Krishi Upaj Yojana” (Special Agricultural Produce Scheme). This scheme has been introduced in 2004, to boost exports of fruits, vegetables, flowers, minor forest produce and their value added products. As per this scheme, export of these products shall qualify for duty free credit entitlement equivalent to 5% of FOB value of exports.
- The Government should provide transport subsidy for soy meal exports as a large proportion of processing units are located in the hinterland.
- There is increasing demand for non-GMO soybean meal in Europe, Japan and South East Asia. Indian soybean meal, which is non-GMO, has the potential to carve out significant market share, by highlighting this attribute through focused promotion campaigns, which could be undertaken jointly by the Central Government and Industry Associations.

Exhibit 3.4.4.B: Export of Non-GMO soybean meal (tonnes)	
Year	Consumption
2001-02	98500
2002-03	75000
2003-04	130000

Source: SOPA

- Indian soymeal has a higher protein content compared to other leading countries as displayed in Exhibit 3.4.4 (D), and can thus command higher realisations. This advantage needs to be highlighted to potential importers.

Exhibit 3.4.4.C: Protein meal of various soymeals				
Category	India	U.S.	Argentine (High-Pro)	Brazilian
Protein %	48.0	44.0%	46.8	44
		48.6 High-Pro		48 Pro-Fat

Source: Results of Global Soymeal Analysis Survey 1990/00 (USDA)

3.4.5 Export Promotion of Edible Oils/Oilseeds

The total exports from the Edible oils /oilseeds sector is currently estimated at INR 54.5 bn in 2003-04, with oil meal accounting for around 60% of the total. The action plan for increasing these further has been discussed in detail in Section 3.4.3

Exhibit 3.4.5: Exports of oilseed, minor oils and fats and oil meals								
Quantity in ('000) tonnes, Value in INR Million								
Year	Oilseeds		Minor Oils		Oil meal /extraction and Fats		Total (Apr-Mar)	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
1998-1999	139	5154	196	6146	3627	20429	3962	31729
1999-2000	240	6636	237	9186	2677	17369	3154	33191
2000-2001	323	8377	232	8438	2353	17116	2908	33930
2001-2002	373	8604	209	5813	3022	21181	3604	35597
2002-2003	210	5916	165	5307	1902	15307	2277	26530
2003-2004 (Estimated)	385	12873	262	10966	3362	30630	4009	54469

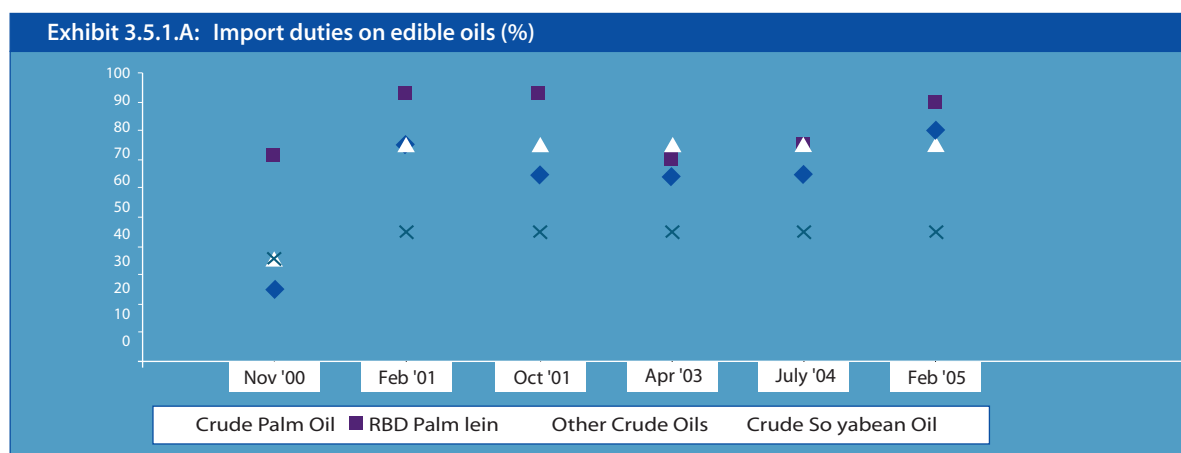
Source: Solvent Extractors' Association of India, Mumbai

3.5. Regulatory framework developments

3.5.1 Duty structure

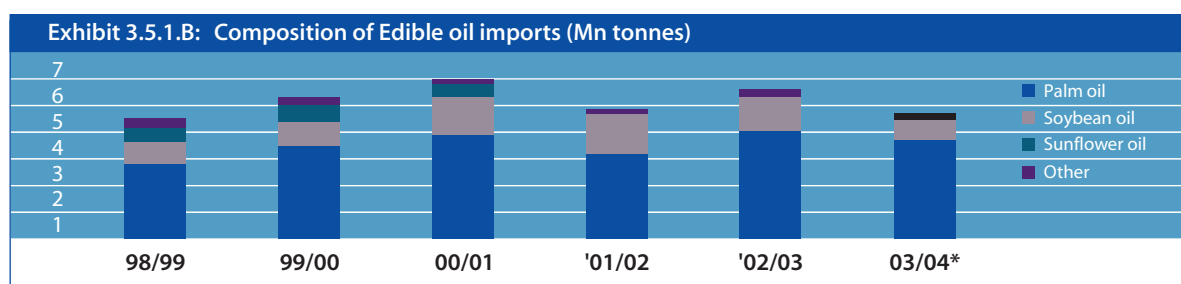
The structure of import duties in the edible oil sector needs to be viewed from a historical perspective. Until the early 1990s, India pursued self-sufficiency in edible oil production but trade policy reforms in the mid 1990s, followed by declining domestic oilseed production, fuelled an increase of oil imports.

Depending on the domestic demand-supply situation, tariff rate on certain oils and the differentials between refined and crude oil tariffs (see Exhibit 3.5.1 A) are modified periodically. Duties are based on the Tariff Rate Value (TRV), which is intended to prevent the reporting of low import prices to evade tariffs. The TRVs are reviewed from time to time and revised according to market conditions.



* Other crude oils includes rapeseed, sunflower and safflower
Source: Solvent Extractors Association of India

At present, imports account for over 40% of India's consumption requirements. In 2003-04, edible oil imports were valued at over ~ INR 110 bn.



Source: Oil World Annual 2004

Exhibit 3.5.1.C: Quantum and Value of Edible oil imports

Year: Apr - Mar	Quantity: (Million Tonnes)	Value: (INR Billions)
1992-93	0.10	1.7
1993-94	0.12	1.6
1994-95	0.32	6.1
1995-96	0.99	21.8
1996-97	1.42	29.3
1997-98	1.27	27.7
1998-99	2.62	75.9
1999-00	4.20	79.8
2000-01	4.18	59.8
2001-02	4.32	64.7
2002-03	4.37	87.8
2003-04	5.30	116.7
2004-05	3.30	81.3

Source: SOPA

A) Need for a stable edible oil import policy to boost efficiency in operations

- Frequent changes in import duties, which favour import of crude oil at certain times and import of refined oils at others, tend to increase operational complexity for the domestic processing industry.
 - In 2000, higher tariffs were introduced for refined oils, as opposed to crude oils. This was designed to shift imports from refined oils to crude oils to improve capacity utilisation in the refining sector.
 - In April 2003, duties on RBD palmolein were reduced from 92.4% to 70%. This led to an increase in the share of refined oils.

- July 2004, duties on RBD palmolein were increased to 75%
- In February 2005, duties on RBD palmolein were further increased to 90%, while that on Crude Palm Oil (CPO) were increased from 65% to 80%.

Exhibit 3.5.1.D : Palm oil imports Share of Crude vs Refined		
	Crude Palm Oil + Crude Olein	RBD Palmolein
Jul 04 - Sep 04	77%	23%
May 03 - Jun 04	82%	18%
Nov 02 - Apr 03	100%	0%
2001-02	96%	4%
2000-01	49%	51%
1999-00	27%	73%
1998-99	0%	100%

Source: Solvent Extractors Association of India

- In February 2001, the import duty on both sunflower oil and safflower oil increased from 35% to 75%, while the duty increase on soybean oil was less significant, from 35% to 45%. This led to an increase in the consumer prices of sunflower and safflower oils and led to a shift in consumption, to cheaper options, like soybean oil. As per the WTO agreement, the tariff value in India can be theoretically increased to 300% on edible oil imports, other than soybean oil (bound rates of 45%) and rapeseed oil (bound rates of 75%). The imports of sunflower oil are in the range of 100,000-120,000 MT, at the current Tariff Rate Quota of 50% (ceiling 150,000 MT).

A) Need for establishing a framework for deciding duty / duty differentials on various oils

- The duty differentials should be based on an audited cost structure for palm, soybean and sunflower oil, established by the government. This structure should have the flexibility to determine the tariff rates/duties, adjusting to varying international prices, such that the cost to the consumer does not exceed a certain value. This could be reviewed on a quarterly basis.

Exhibit 3.5.1.E: Import duties on edible oils (as of Feb 2005)		
Item Description	Current rates of duty on Crude Edible Oils	Current rates of duty on Refined Edible Oils
Soyabean Oil	45%	45%
Palmolein	80%	90%
Palm Oil	80%	90%
Groundnut Oil	75%	85%
Sunflower/Safflower Oil	75%	85%
Coconut Oil	75%	85%
Rapeseed/Mustard Oil	75%	75%
Other Oils	75%	85%

Source: Solvent Extractors Association of India

- The duty structure should ensure that there are no anomalies, e.g. negative impact of custom duty on crude oil import (detailed below) in 2003
 - CPO can either be refined or used directly for vanaspati or it can be processed and refined, in which case, it translates into three resultant products - refined palmolein, palm stearin and palm fatty acid. When directly imported, the customs duty on vanaspati is only 30%, while on the other three products; it will reduce to only 60.30% as explained in the table below:

Exhibit 3.5.1.F: Negative impact of customs duty* on crude oil imports (2003)			
Product	Yield %	Customs duty (%)	Effective rate
Refined Palmolein	73	70.0	51.1
Palm Stearin	21	35.2	7.4
Palm Fatty acid	6	36.0	2.1
Total	100		60.6

Source: Industry Estimates

- As per Industry sources, import of industrial grade CPO is permitted at 20% customs duty subject to minimum 20% FFA and is clearly targeted for industrial use. However, there has been a flagrant violation of the end-use requirement and there are instances where industrial CPO is being refined and then used to make Vanaspati or sold in the market as RBD palm oil. To curb misuse of duty concessions and to ensure that only genuine industrial users import palm stearin, PFAD and industrial CPO, the government should ensure strict adherence to the actual user condition.

3.6 Vision, strategy and action plan

3.6.1 Market potential

As per the sub-committee report (2004) on demand projections for oilseeds /edible oils in the X Five year plan (2002-07), the demand for edible oils is expected to increase from current levels of 10.9 Mn tonnes to 12.3 Mn tonnes by 2006-07. This assumes a per capita consumption increase of 4% and a population growth of 1.9%, which translates to an overall growth in demand @ 6% p.a. Based on the above assumptions, edible oil demand in the year 2015 is expected to be 21.3 million tonnes.

The share of branded edible oils could increase further from the projected 16% by 2015 from the current level of 9.2%. The branded edible oils segment is estimated to grow to INR 173.9bn, from the current level of INR 50bn.

Exhibit 3.6.1.A: Vision for edible oils sector										
	Current Market Size / Growth				Market Size / Growth for 2010 and 2015					
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Volume 2010 (Million Tonnes)	Value 2010 (INR Million)	Volume 2015 (Million Tonnes)	Value 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)
Edible Oils										
Market	10.9	45459	495500	5.3%	15.62	712966	21.32	976760	6.2%	6.4%
Unbranded	9.9	45000	445500	5.0%	13.65	614274	17.84	802832	5.5%	5.5%
Branded	1.0	50000	50000	8.0%	1.97	98691	3.48	173927	12%	12%
Share of branded	9.2%				13%		16%			

3.6.2 Supply

Exhibit 3.6.2.A: Likely domestic production and import requirement in 2010 and 2015			
	Current (2004)	2010	2015
Total Demand	10.9	15.6	21.3
Total Area under Oilseeds (Mn Hectares)	23.4	28	32
Yield (Tons / hectare)	1.07	1.2	1.4
Production of oilseeds (MT)	25.1	33.6	44.8
Domestic supply of edible oils Mn tonnes	7.0	10.1	13.4
Total edible oil imports - Mn tonnes	4.3	5.9	8.3
Imports as share of demand	39.4%	38.1%	39.5%

India will continue dependence on imports to the extent of ~ 40% of its consumption requirements (Exhibit 3.6.2.A). The improvement in yields and the increase in area under cultivation can at best ensure that domestic oilseed production is sufficient to meet 60% of consumption requirements.

¹⁰Set up under the Chairmanship of Economic and Statistical Adviser in the Directorate of Economics & Statistics (DES).

3.6.3 Investment

The envisaged market size entails investments in additional refining capacity.

Exhibit 3.6.2.B: Estimated investment in the edible oil sector by 2010 and 2015						
	Capacity required		Investment required			Total Investment (2005 - 15) INR Million
	Current Capacity (Tonnes / day) & Utilization (%)	New Capacity required (2005 - 10) Tonnes/day	New Capacity required (2010 - 15) Tonnes/day	Investment (2005- 10) (INR Million)	Investment (2010 - 15) INR Million	
Crushing	183333	0	0	0	0	0
Capacity utilization (%)	20%	30%	40%			
Solvent extraction	137255	0	0	0	0	0
Capacity utilization (%)	34%	50%	65%			
Refineries	63583	5858	6360	2695	2926	5621
Capacity utilization (%)	40%	60%	75%			
Subtotal - Edible Oils				2695	2926	5621

- Oilseed Development programme (INR 5 Billion / year for 6 years) = INR 30 Billion
- Tree Borne Oilseeds Development (INR 800 Million / year for 6 years) = INR 4.8 Billion
- Oil Palm Development programme (INR 100 Million / year for 6 years) = INR 0.6 Billion

3.7 Summary of action plan

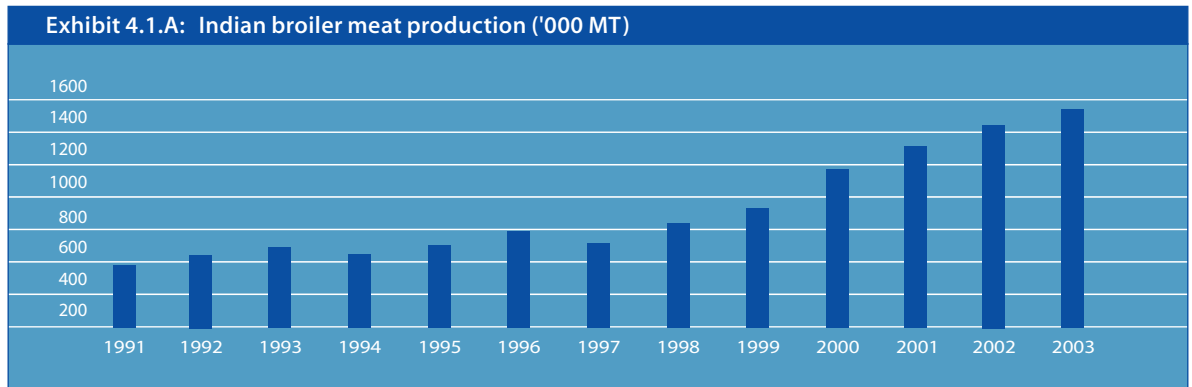
- Increase Area under oilseed production to 32 Mn ha by 2015
 - The farmer could have the option of selling the produce in the market and claiming a subsidy from the Government equal to the Support price less the Market price. At the same time, the processors buy the oilseeds at the Market price.

- Warehouse receipt financing could enable farmers to enhance returns by selling output during an industry upswing, rather than immediate selling on harvest.
- Increase Oilseed yields from current 1.07 tonnes / ha to 1.4 tonnes / ha by 2015 by:
 - Increasing area under irrigation from 23% to 30% by 2010
 - Developing high yielding, early maturing and pest/disease resistant varieties of oilseeds having more oil content suitable for different agro climatic zones of the country
- Encourage private sector participation and direct farmer processor linkages. This would ensure better crop management and resulting offtake arrangements
- Leverage Potential of Rice Bran Oil by increasing production of edible grade rice bran oil from 0.6 mn tonnes to 0.9 mn tonnes by modernizing huller rice mills and installation of Rice Bran oil refineries.
- Augment the availability of vegetable oils from tree borne oilseeds from 0.15 million tonnes to 0.30 million tonnes by increasing collection, and through establishment of compact plantations of tree borne oilseeds in wastelands and other lands, to cover an area of 1 lakh ha by 2006-07
- SSI reservation for crushing of Rapeseed/ Mustard, Groundnut and Safflower to be removed
- The duty differentials should be based on an audited cost structure for refining palm, soybean and other oils established by the government. This structure should have the flexibility to decide the tariff rates/duties, adjusting to varying international prices, such that the cost to the consumer does not exceed a certain value. This could be reviewed on a quarterly basis.
- The Central Government should ensure implementation of the Edible oil Packaging order by all state governments. The manufacturers would be held accountable for the product quality and this would reduce the sale of adulterated oil, thereby provided superior product quality to the end consumers.
- Taxation
 - Given that edible oils are an item of mass consumption, there should zero sales tax and other state-level taxes on vanaspati or edible oils.
 - The by-products produced during the refining of high FFA Rice bran oil (acid oils, fatty acids, wax etc.), should be exempted from Excise duty (currently 16%) to encourage upgradation efforts.
- FTAs need to guarded adequately to prevent creation of uneven playing field for domestic industry. E.g. a minimum value addition norm should be laid down to ensure that landed price of imported oils through FTA agreement is not significantly lower than domestic prices.
- PFA rules should be amended to
 - allow genuine, clinically proven healthier alternatives to communicate their benefits, together with details of the agency which has endorsed these benefits.
 - allow blending of more than two oils
 - allow blended oils to be sold in consumer packs of upto 15kg
 - revise the standards for unsaponifiable matter from 3.5% (max.) to 4.5% (max.) in line with international standards.

Meat and Poultry

4.1 Production and consumption

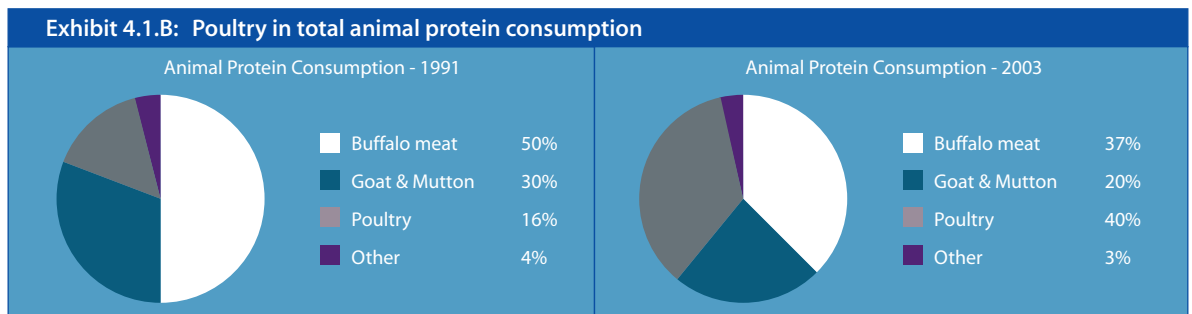
Poultry meat is the fastest growing animal protein in India. The estimated production is 1500 thousand tonnes growing at a CAGR of 11% through 1991-2003. Per capita annual consumption has grown from 420 grams in 1991 to about 1.5 kg in 2003. Excluding the vegetarian population, per capita consumption is approximately 1.75 kg per annum.



Source: USDA

Buffalo meat production has been growing relatively less rapidly at a CAGR of 5% in the last 6 years. The current production levels are estimated at 1.9 million MT. Of this, about 21% is exported, primarily to Philippines, Malaysia, Egypt and a few countries in the Middle East. Mutton and lamb is a relatively small segment, where demand has been outstripping supply, which explains the high prices in the domestic market. The production levels have been almost constant at 950,000 MT with annual exports of less than 10,000 MT. This has restricted large processing companies from developing business interests in this sector. There is negligible interest of organised players in this segment, in view of stiff price competition from the unorganised sector. The analysis in this report, is therefore focused on poultry and buffalo meat.

Poultry's share in the total animal protein pie has grown from 16% in 1991 to 40% in 2003, at the expense of all other animal proteins.

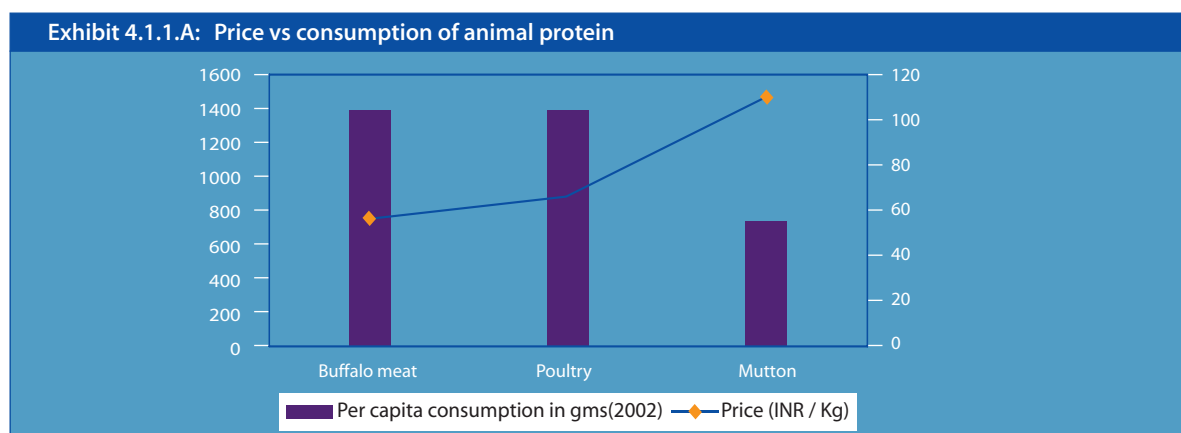


Source: USDA

4.1.1 Consumption drivers

While taste is a key factor influencing regional differences in meat consumption patterns, the other drivers of consumption of meat products in India are:

- **Affordability** Consumption is related to the price of different meats. Buffalo meat, which is the cheapest, is the most consumed meat, even though it is associated with beef.



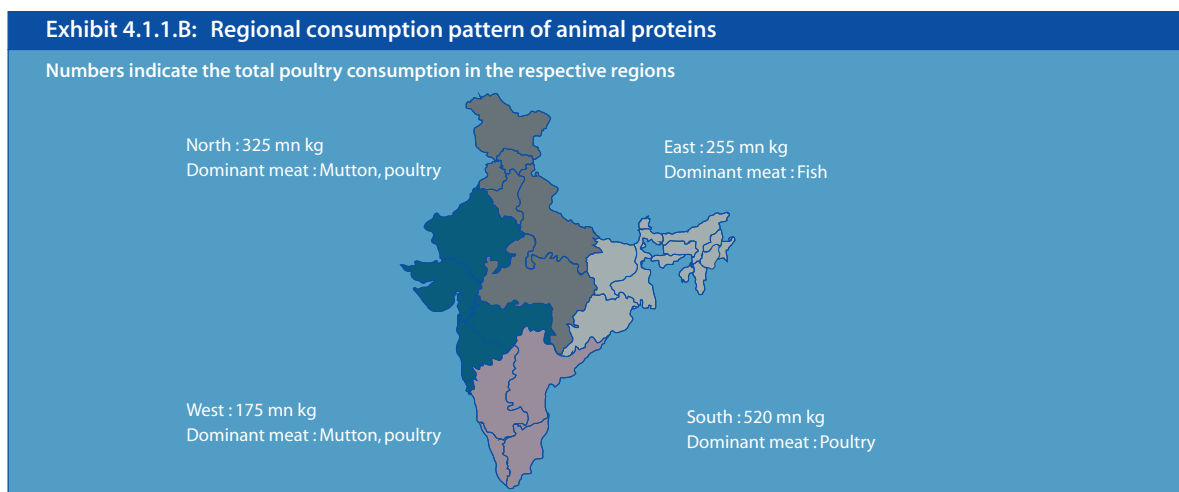
Source: USDA

High levels of integration in the poultry industry in Southern India, have resulted in greater production efficiencies and control over the distribution chain, thereby reducing the prices of poultry (current wet market broiler prices in Mumbai of INR 40-50 per kg of live weight compare with INR 30 in Coimbatore). This has resulted in Tamil Nadu's per capita poultry consumption being over 3 times the national average.

- **Vegetarianism** - Contrary to perception, India has a strictly vegetarian population of only about 20% (Source: Survey concluded in the 'People of India' by the Anthropological Survey of India). According to the Survey, the younger segment of population and men are more likely to be non-vegetarians. Given that approximately 35% of Indian population is in the 5-19 age group, conversion of the vegetarian population is expected at a rapid pace. As has been observed in several other countries, vegetarians who choose to convert to non-vegetarianism, experiment with poultry prior to consuming other types of meat products.
- **Religion** - 80% of India's population follows the Hindu religion, which prohibits consumption of beef. This has also translated into a strong stance against the slaughter of cows which has encouraged all but two state governments to ban the slaughter of cows. The Indian Hindu population consumes buffalo meat instead however, this is considered inferior to poultry and mutton. The Muslim population, constituting 12% of the population, does not consume pork, which is also not a preferred meat in India. There is no religious sentiment associated with poultry, and is consumed by all non-vegetarians. However a wide majority of the

population refrains from consuming meat on certain religious festivals during the year.

- Regional preferences - A significant proportion of marine products are consumed in Eastern India, and in the coastal regions.



Source: Rabo India analysis

- Preference for fresh meats - Indian consumers prefer to buy freshly cut meat from the wet market, rather than processed or frozen meats. A mere 6% of production (about 100,000 MT) of poultry meat is sold in processed form. Of this, only about 1% undergoes processing into value added products (ready to eat / ready to cook). The relative ease of handling of poultry meat in wet markets enables small retailers to supply it in fresh form, thus leading to widespread availability.

In the case of large animals, processing is undertaken almost exclusively for exports. This can be explained by the following aspects of the domestic market

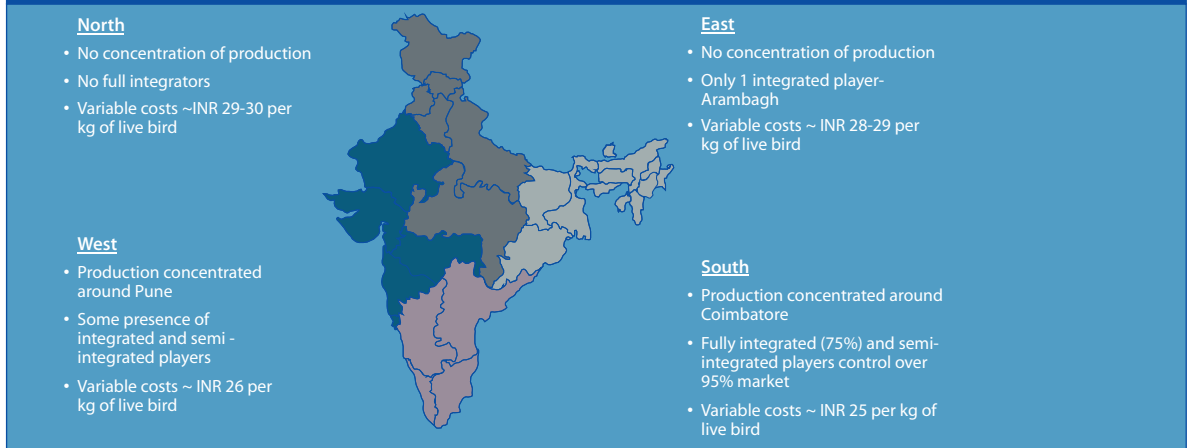
- Lack of consumer preference for chilled / frozen meats
- Lack of infrastructure for handling chilled / frozen meats
- Health concerns associated with red meats leading to preference for poultry

4.2 Nature of organised industry

A. Poultry meat

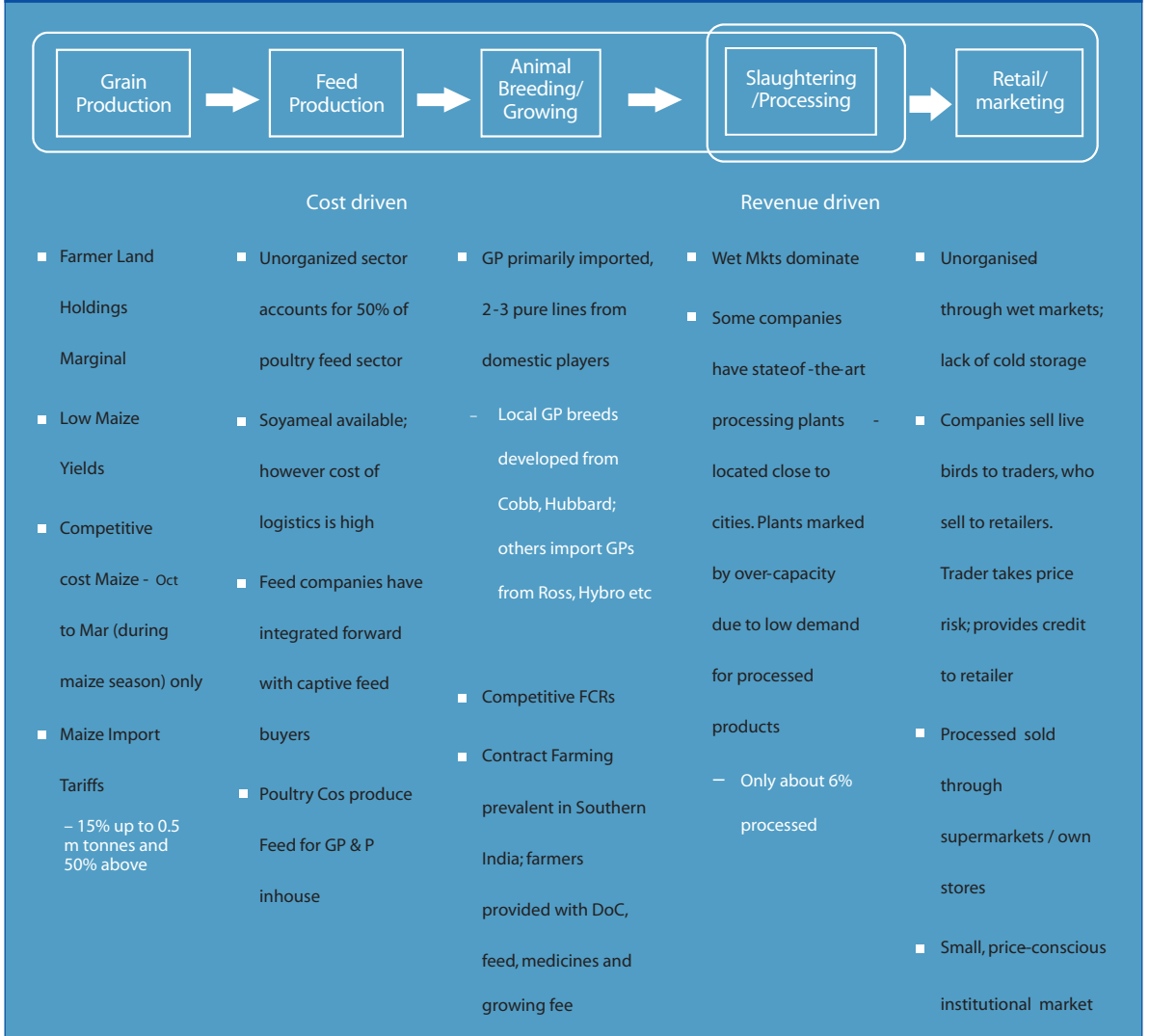
Unlike other food segments, several players have set up integrated operations in poultry. Exhibit 4.2 A depicts the regional differences in poultry integration levels and the impact on poultry costs. Exhibit 4.2 B depicts linkage of processing with the supply chain.

Exhibit 4.2.A: Regional differences in poultry chain



Source: Rabo India analysis

Exhibit 4.2.B: Key features of the Indian poultry supply chain



Source: Rabobank analysis

The current poultry processing capacity in India is approximately 25000 birds per hour.

- Average utilization is low at about 30%. Several processing facilities are not operational primarily due to lack of success in branding and in acquiring sustainable scale of operations
- Key players include Venky's, Godrej, Arambagh and Suguna. Suguna is primarily engaged in exports while the other players are more focused on the domestic segment.

B. Large animal meats

As mentioned earlier, processing of large animals is largely for the purpose of exports. There are 12 integrated facilities for slaughtering & processing. The other processors use municipal / other slaughter houses to meet their requirements.

The total processing capacity in India is over 1 million MT per annum, of which 40-50% is utilized. Key players include Hind Agro, Allana and Al Kabeer. Hind Agro is the only Indian player which has backward linkages with male buffalo calf rearing. The lack of clarity on the policy for rearing buffaloes for slaughter is the key factor which has restricted integrated operations. Further, buffalo slaughter is allowed in India. However, it is permitted only when the buffalo outlives their useful life as a dairy or a draught animal.

India exports about 500,000 MT of meats, of which over 90% is buffalo meat. Indian buffalo meat is witnessing strong demand in international markets due to its lean character and its near organic nature. India is the fifth largest exporter of bovine meat in the world and currently exports to over 60 countries. Indian buffalo meat exports have the potential to grow significantly due to various reasons such as:

- Lowering of subsidies in EU is leading to reduced domestic production and increased dependence on imports
- Australia, which has been a significant exporter of bovine meat, has been affected by drought which has impacted herd building
- North America's export capabilities have been affected by occurrences of BSE
- Brazil, another large exporter, may not be able to raise production in line with growth in export demand

4.2.1 Key issues in processing

A. Quality and hygiene levels in wet markets

Most cities in India have banned street side slaughter of large animals; therefore these animals are slaughtered in authorised slaughter houses and the meat is sold through licensed wet market shops. However, in the case of poultry and other small animals, most municipalities (with the exception of Delhi) permit slaughter of

poultry within their municipal limits. Slaughter takes place at different shops across the city (about 2000 in Mumbai) although these shops do not have a license to do so. There are several issues associated with street-side slaughter of poultry. Improper slaughter leads to:

- Imperfect bleeding
- Meat hardening/blackening due to pitting against the drum used
- Primitive and crude de-feathering techniques
- Quality of water used may not always be potable
- Poor hygiene practices in manual handling for defeathering, chopping, removal of viscera etc.
- Cross-contamination in slaughter
- Lack of chilling after de-feathering resulting in immediate bacterial attack.
- Lengthy farm-to-slaughter time leading to dehydration; also cause for shriveled meat
- Improper ventilation as density of birds per sq. ft. is abnormally high
- Chicken droppings / feed / feathers spread micro-organisms while being transported within the city (for example, slaughter waste generated per day in Mumbai alone is about 150 tons)

The solution to the above mentioned problems is to ban street side slaughter of all animals, as has been done across cities in the developed world.

It is recommended that each municipality adopt the following with regard to animal slaughter:

- Permit 1-3 (based on size of city, meat requirement) slaughter plants to be set up in proximity to the city. The slaughter plants can be owned and operated by private parties with the Government stipulating the design, animal welfare standards and the slaughter fee structure.
- As is the current system, the traders / farmers will continue to bring the birds to the city. The birds would be slaughtered at the common facility and then sold by the farmers to the existing wet market shops. The slaughter facilities should have freezers and storage for frozen chicken to allow traders / farmers to store the meat temporarily if selling prices are low.
- The slaughter plants should be connected to a rendering plant so that the offals and other organic waste generated by the slaughter, can be used as pet food or organic fertilizer.
- The slaughter facilities must have independent veterinary inspectors to ensure compliance with standards
- The slaughtered chicken would get transported in chilled / frozen condition in insulated boxes / reefer vans by the distributors / traders.

The ban can be implemented in a phased manner targeting metros in the first phase, followed by other cities.

B. Quality and hygiene inspection of processed meats

The Meat Food Products Order, 1973 ensures quality control and hygienic manufacturing conditions of meat food products for domestic consumption. MFPO was administered by Directorate of Marketing and Inspection, Department of Agriculture and Cooperation, Ministry of Agriculture. However, since May 2004, the Act is within the purview of the Ministry of Food Processing Industries. MFPO is applicable only for value-added meat products (and not applicable to dressed / fresh meats). There are several issues with the current level of control on processed meat quality in India:

- MFPO is an extremely dated order whose provisions are rarely applicable to the current industry and the certification does not have any relevance to the customer. Many products that are widely produced by the industry do not find a definition or mention in the MFPO.
 - In certain categories of MFPO license (such as 'B' category), the raw meat has to be sourced from the closest possible slaughter facility. This rule is impractical if processors are able to source products at better quality or cheaper prices from another source.
- MFPO is applicable only for value added meats. Registration with MFPO is not mandatory for companies / entities which are not making value added meat products; therefore an establishment producing dressed chicken is not required by law to register with the MFPO and may not comply with any standards on quality and hygiene.
- MFPO standards are not the same as those defined by other agencies such as Bureau of Indian Standards (BIS) and PFA. Similarly, current Indian standards on use of immuno-biologicals, antibiotics and other pharmaceutical active substances are not harmonized with Codex Alimentarius Commission (CAC) and OIE (Office International des Epizooties-World Organization for Animal Health) standards. In order to ensure that exports conform to international standards, it is necessary to align Indian standards with OIE standards and update them on a periodic basis.

Therefore MFPO needs to be amended to meet the changing requirements of the industry. It needs to be extended to cover all meat products irrespective of the extent of value addition. Further, food safety standards need to be aligned internally (between the various administering agencies) and with international standards laid down by Codex and OIE.

C. Disease surveillance

The Department of Animal Husbandry has already identified 3 zones which will be free of Foot & Mouth Disease (FMD). These zones cover the main slaughter plants of the 3 major buffalo meat exporters in India. These zones however still depend on vaccines for ensuring freedom from FMD. Once dependence on vaccinations reduces, Government of India will invite the OIE to take serum samples from these zones and

declare them FMD-free zones. This will enable India to export buffalo meat to the EU and the USA.

The Department of Animal Husbandry needs to step up its efforts in ensuring that OIE declares India free of BSE. India does not have any cases of BSE, however, OIE does not recognize this.

Disease surveillance can be stepped up with improved facilities at livestock markets and slaughter houses, including testing by veterinarians. This issue is discussed in the sections on livestock markets and slaughter houses.

D. High supply chain costs

Feed constitutes almost 60% of the total broiler cost. Therefore, fluctuations in the prices of maize and oilmeals significantly affect poultry producers.

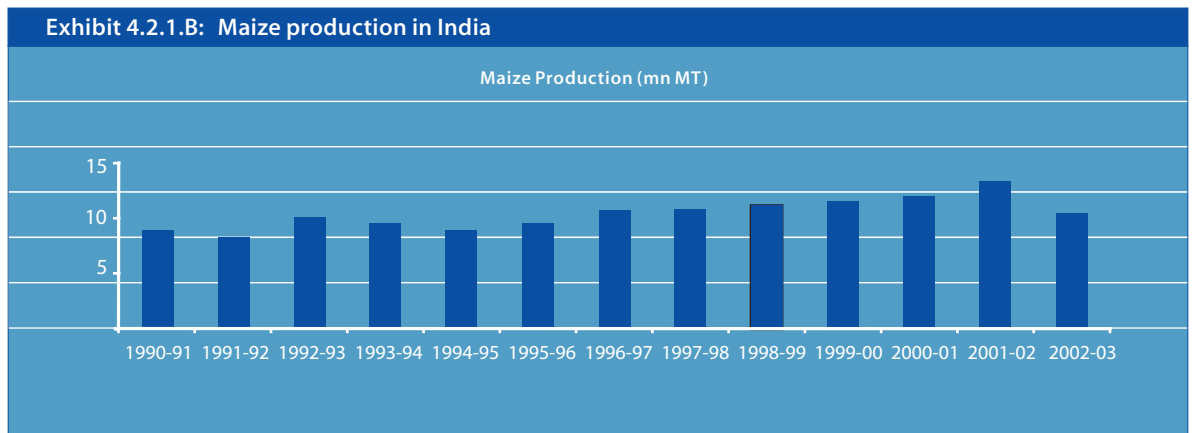
Exhibit 4.2.1.A: Cost structure of Indian poultry (Western India)			
Particulars	Remarks	Cost in West India (INR)	Percentage of total variable cost
Feed	1.75 kg x FCR 1.9 @ INR11 /kg	37	59%
Day old Chick	Varies across the year	8-12	16%
Vaccination, medication		2	3%
Growing fee to farmer	Lowest in South India	3	5%
Mortality @ 5%		0.50	1%
Agent/transport		2.5	4%
Shrinkage in transport	2%	0.5	1%

Particulars	Remarks	Cost in West India (INR)	Percentage of total variable cost
Retailer	Retailer margins much lower in South	7-8	12%
End cost per bird		60-64	
End cost per kg live weight		35-38	
End price in Mumbai		45	
End price in Coimbatore		30	

Source: Industry estimates, Rabobank analysis

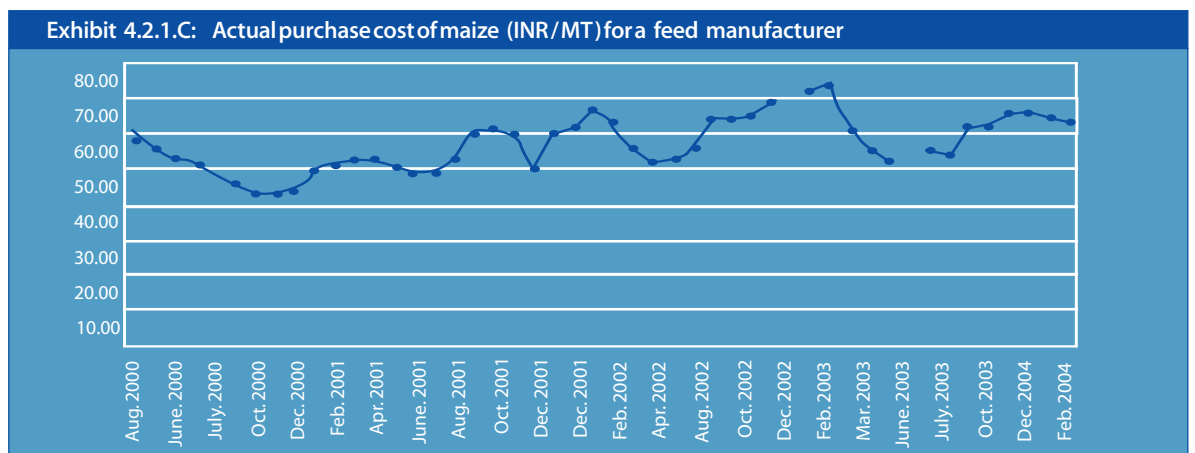
1) Maize

Maize is not the most preferred crop for cultivation, in a regulatory environment which provides attractive support prices for competing grains – rice and wheat. As maize is primarily a rain-fed crop, the annual production level is dependent on monsoons, and therefore displays significant fluctuations.



Source: Ministry of Agriculture

Further, during the December-April period, maize is grown only in a small region in Eastern India, and this leads to high prices. The price variation in maize over the last 4 years is provided in Exhibit 4.2.1 C. The Exhibit depicts a standard deviation in prices of about 14%.



Source: Industry Estimates

The inconsistent and slow growth in production of maize is in contrast with the rapidly increasing demand for it in the country.

- The CAGR of maize production, even after excluding 2002-03 when the production was abnormally low due to poor monsoons is 3.5% over the last 11 years. The CAGR over the 1990-91 to 2002-03 period is much lower at 1%.
- Maize consumption by the animal feed sector (which accounts for almost 50% of maize consumption) has been growing much faster than maize production. The requirement of maize for poultry feed has been growing at a rate of over 10% annually. Therefore, the total requirement for maize in India is growing at a CAGR of over 6% (assuming that non-feed use of maize is growing at a conservative 3%).
- Further, Indian exports of maize to Bangladesh, Nepal and other countries have been rising exponentially. These countries do not have significant domestic maize production, while the poultry industry in these countries is growing rapidly (@15% in Bangladesh).

Exhibit 4.2.1.D: Maize exports from India				
Year	Quantity of Maize Exported (MT)		Rates (USD/MT)	
	Bangladesh	Other Countries	Bangladesh	Others
2002-03	200,000	Nil	120-135	
2003-04	118,000	515,000	132-148	136-150

Source: Industry estimates

Over 6% of maize produced was exported last year, while imports were negligible (due to negative import parity at the current duty rates). Maize is currently in the TRQ (Tariff Rate Quota) regime which stipulates that the first 500,000 MT of imports are permitted with an import duty of 15%, and for imports exceeding this quantum, there is a duty of 50%. Exhibit 4.2.1 E compares maize production costs across key growing regions and indicates that Indian maize production costs are high compared to those of Brazil.

Exhibit 4.2.1.E: Comparison of maize cultivation costs				
	Figures in USD			
	Bihar (Rabi)	UP (Kharif)	Brazil (Paraná)	China
Yield (tonne/acre)	1.4	0.6	2.59	2.5
Cost per tonne	61.8	67.7	42.4	68.5
Average farmgate price per tonne	83	83	58	90
Farmgate price/cost	1.3	1.2	1.4	1.3
Cost to Feed Manufacturer per tonne	105-145	105-145	100-120	110-130

Source: Rabobank analysis

However, domestic maize is almost always cheaper than imports (even on zero import duty) due to freight costs. At the in-quota tariff of 15%, maize imports are unviable at all times of the year (see exhibit 4.2.1F).

Exhibit 4.2.1.F: Imported vs domestic maize prices								
	CBOT price (USD /100 bushels)	Freight + (USD) handling 100 bushels	+ 15% in- quota tariff	USD-Re price	Landed Price (INR/Kg.)	Ex-mill with 15% import tariff (INR/Kg.)	Ex-mill with 0% import tariff (INR/Kg.)	Domestic Hyderabad (INR / kg)
Mar '03	230.0	50.8	323.0	47	6.0	6.8	6.0	5.5
May '03	256.0	50.8	352.9	47	6.5	7.3	6.5	5.5
July '03	223.0	50.8	314.9	46	5.7	6.5	5.8	5.5
Sept '03	227.0	50.8	319.5	46	5.8	6.6	5.8	6.2
Dec '03	254.8	50.8	351.4	46	6.4	7.2	6.3	6.0
Mar '04	295.5	50.8	398.3	45	7.0	7.8	6.9	5.5
May '04	286.5	50.8	388.0	45	6.9	7.7	6.8	6.5

Source: CBOT, Industry

Most Indian poultry players (and other users of maize) believe that they are not provided a level playing field in a scenario where imports are restricted while exports are unrestricted. The Central Government needs to address this inconsistency in its policy on maize.

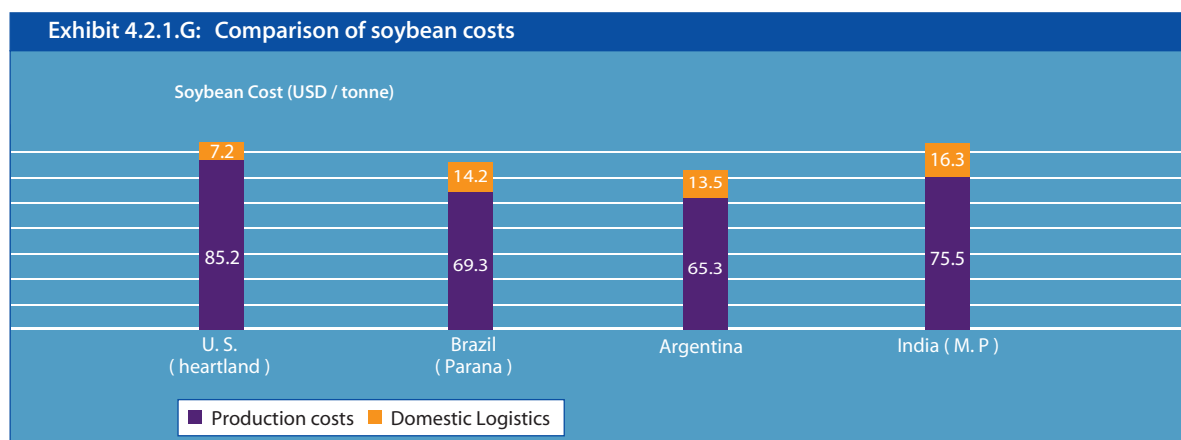
Exhibit 4.2.1 F displays that even at 0% import duty, imported maize was cheaper only in September 2003 (maize prices are highest just before the arrival of the kharif crop). Therefore it is recommended that the in-quota tariff rate should be brought down to 0% and imports be subject to the following conditions:

- Only actual users may import maize (therefore the list of authorised importers is expanded beyond NAFED, STC, MMTC, PEC, STCL and State Cooperative Marketing Federations)
- TRQ regime stays in place and the 0% duty is applicable only to the first 500,000 MT of imports as already stipulated. This is to ensure that the domestic crop is not adversely affected through any large scale imports during a down cycle in international prices.

Several poultry companies have attempted contract farming of maize to ensure better supply. However the models have not been very successful, primarily on account of the impact of the above policies on maize prices.

2) Soymeal

Indian production costs of soybean are reasonably competitive; however, inefficient storage and transport add significantly to the final price of soymeal. Similar logistics inefficiencies are applicable to maize too.



Source: USA, Rabo India

The solution for reducing logistics costs lies in encouraging bulk movement of soybean / meal rather than in gunny bags, as is the current practice.

4.3 Infrastructure and related guidelines

4.3.1. Transport of animals by road

Currently the space requirement in trucks is defined by the type of truck (as described in the Motor Vehicles Act). However, these need to be re-defined on the basis of the actual space requirement per animal, irrespective of the truck size. Further, the transport standards need to be uniform across all states to avoid harassment at inter-state borders.

4.3.2 Slaughter of animals

A. Maintenance of welfare standards

The Ante mortem examination of animals before slaughter is mandatory. Further, welfare standards need to be maintained such as:

- Avoiding slaughter of pregnant / productive females
- Proper methods of slaughter avoiding cruelty
- Proper bleeding of animals
- Adequate rest (24 hours) and availability of water and shade for the animal

Post mortem examination is also mandatory.

B. Slaughter facilities

Currently, there are 4030 slaughterhouses in the country, which are recognized or authorized by local bodies. In addition, a considerable number of animals are slaughtered in unauthorized places. Industry sources estimate that up to 50 percent of animals slaughtered in any urban center are from unauthorized slaughter.

1) Municipal slaughter houses

The infrastructure and facilities at most slaughter houses are inadequate and outdated. The fee charged on animal slaughter which is supposed to be used for maintenance and upgradation, is diverted to other uses by most state Governments. Further, the operating authorities are also responsible for providing licenses for slaughter. The lack of separation of these roles leads to laxity in adhering to operating standards. For instance, the animals are often kept in poor conditions (due to lack of adequate infrastructure) which violate the defined norms.

In order to improve the slaughter conditions, the slaughter houses need to be modernised and control and supervision needs to change. A scheme for upgradation of slaughter houses was initiated by the Central Government which stipulated that the cost of upgradation was to be shared equally by the Central and the respective State Government. This scheme has been operational through the eighth, ninth and tenth (for first two years) plans, during which INR 352mn was sanctioned for 63 projects. Of this quantum, INR 199 million has been utilised and 16 projects have been completed. However, the other projects have not commenced/been completed due to lack of matching contribution forthcoming from state Governments.

The above scheme has been terminated on March 31, 2004. In the meanwhile, the Ministry of Food Processing has extended a similar scheme from 2003-04 onwards, which would provide a grant of INR 40mn or 25% (33.33% in backward areas) of the capital cost, whichever is less, for modernisation of slaughter houses. The remaining 75% of the cost can be contributed by any agency (including private parties).

However, the success of these schemes is expected to be limited due to various reasons:

- Lack of interest of State Governments to invest in these slaughter houses
- Frequent interference by animal rights activists
- Negative perception of meat eating and therefore limited proactive action by all concerned authorities

Given that this subject is highly controversial and there is hesitation on the part of State Governments to be associated with further investments in slaughter, **privatisation of municipal slaughter houses is the solution.**

The proposed system would have the following features:

- The Government, through a tendering process, can invite private parties to upgrade and operate existing slaughter houses.
- The guidelines for operating the slaughter houses would be laid down by the Government. These guidelines would address:
 - animal welfare standards
 - commercial interests of the private sector party (The Government should stipulate a maximum fee that can be charged by the operator for each slaughter)
 - quality and hygiene aspects
 - ensure adequate veterinary support at the slaughter house
 - rendering facilities for offals and ETP to treat abattoir effluent
 - set minimum certification standards which need to be met such as HACCP / ISO 9002

2) Private slaughter houses

Most large export houses need private slaughter houses to meet the quality standards required for exports. However, as meat is a highly controversial subject, few private slaughter houses have been permitted so far (even though meat processing was delicensed in 1991). Locational clearance for a slaughter house is the most difficult to obtain due to social issues related to allocation of land for slaughter.

A possible solution to this is that exporters / processors are allowed to set up their own slaughter units inside the premises of the municipal slaughter houses. Several municipal slaughter houses (including the one at Deonar in Mumbai) have vacant land in their premises which could be leased / sold for setting up private slaughter houses. This will also generate extra revenue for the municipal slaughter houses.

4.3.3 Rearing of animals

The Government needs to amend the existing regulations to permit rearing of animals for slaughter. This will facilitate rearing in herds, rather than of individual animals to enable proper maintenance of health records and for timely vaccinations of animals. Globally, livestock markets are becoming redundant with widespread adoption of contract farming models. Contract farming allows processors to source the animal of their requirement, while assuring the farmers of veterinary support and better remuneration.

However given lack of clarity on whether the Government permits rearing of buffaloes for slaughter, this has not been possible on a large scale in India. Until this policy is addressed, the following issues will continue to impact growth of the Indian meat sector:

- no control over animal feed
- inadequate veterinary care
- small size of farmers leading to complexities in aggregation by processors
- management of livestock markets

The Government needs to amend the act to permit rearing of animals (especially male buffaloes) for slaughter to boost exports, and growth of this sector.

4.3.4 Livestock markets

India has over 2000 markets where livestock are traded. Livestock markets are under the jurisdiction of the state governments although the direct operation and supervision falls within the purview of the local bodies (panchayats, municipalities or corporations). There are a few privately owned markets. State Acts regulate marketing of agricultural produce (Agricultural Produce Marketing Acts or APMC) and the marketing committees are responsible for implementing and enforcing the provisions of the Act.

Several issues are associated with the current state of these markets:

- Markets are primitive, with no facilities for weighbridges, ramp facilities for loading and unloading, feeding and watering
- There are no separate markets for different species of animals.
- Transactions could be direct under private arrangement, through brokers / commission agents, or through auction. However there is no licensing of merchants, brokers or suppliers; transactions could also be under cover (Hatha) system leading to non-transparent pricing.
- There is no veterinarian support to certify animal health

- Wholesale marketing margins amount to about 30% of the consumer price
- As per the Act, market revenue should be utilized for upgradation of facilities, but is diverted for other purposes

Livestock markets need to have adequate facilities for animals and men (water, shelter etc) and should provide veterinary support too. The transactions need to be undertaken in a fair / transparent manner. This requires stringent guidelines on:

- Animal welfare
- Design of the market
- Auction / sale methods (registration of the intermediaries must be compulsory)
- Identification of the animal and a veterinary certificate for the same

It is recommended that the regulation of these markets be the responsibility of the respective State Departments of Animal Husbandry (AHD), with assured presence of state veterinarians to certify the health of all animals. The AHD would also need to specify the maximum fee that can be charged by the market for various transactions to ensure that the charges are fair. An analysis of livestock trade mechanisms in other countries (exhibit 4.3.4(A)) highlights that stringent Government guidelines are necessary to ensure fair trade practices and animal welfare and hygiene levels.

Exhibit 4.3.4.A: Livestock markets in select countries		
Country	Current Situation	Trends
Netherlands	<ul style="list-style-type: none"> • Livestock markets exist • Veterinary support / certification critical for sale of livestock • Strict rules for livestock markets laid out by the Government on hygiene and animal welfare 	<ul style="list-style-type: none"> • Ongoing chain integration is leading to a decline in the number of livestock markets
USA	<ul style="list-style-type: none"> • Feeder cattle mostly traded through livestock markets (spot cash transactions) • Feeder cattle futures contract negotiated at the Chicago Mercantile Exchange serves as the price reference • Over 50% of fed cattle sold through contracting 	<ul style="list-style-type: none"> • Feeder cattle increasingly sold through satellite auctions • Well developed grid pricing to support the same
Australia	<ul style="list-style-type: none"> • Over 50% sale through contracting • Livestock markets (owned by Govt or private parties) are required to adhere to strict guidelines on design, welfare, identification and auction methods 	<ul style="list-style-type: none"> • Futures price discovery mechanisms also commenced
China	<ul style="list-style-type: none"> • Weekly markets in each town with basic infrastructure provided by the Government 	
Mexico / Brazil	<ul style="list-style-type: none"> • Most sales through contracts; livestock markets have virtually disappeared 	

Source: Rabobank

Most countries across the world are shifting from physical livestock markets to

- Contracting direct sale agreements between processor and the farmer
- Technology based auctions with multiple, well-defined criteria for governing the price of the animal

In India, the long term solution to better livestock trading mechanisms requires the removal of ban on rearing buffaloes for slaughter. This would allow contracting, as has been the trend in other countries. Buffalo male calf mortality is exceptionally high (more than three times of the normal mortality rate) essentially due to starvation and negligence of the owners in city dairies. In cities, the man made mortality rate is about 95 to 98%. These calves could be saved and reared for meat production through economical feeding and providing critical inputs.

4.4 Safety net for farmers

The poultry insurance scheme was launched in October 1997. However, this scheme failed due to several lacunae which made it unattractive:

- It was only for exotic and cross bred birds. Indigenous and non-descript birds were not covered
- Major diseases (Ranikhet, Fowl Pox, IB, ALC etc) were excluded from insurance coverage

Insurance schemes need to be revised, such that the scope is widened and major diseases are also covered, with appropriate premia.

4.5 Taxation disincentives

The current taxation system in the meat sector has had a negative impact on growth of the processing industry:

- It creates a non-level playing field between wet markets and packaged meats. Currently, there are no taxes levied on wet market sales. However, sales tax is levied on meat which is branded and sealed (eg Maharashtra- 5.4%)
- Further, the taxation system creates a disincentive for value added products which attract an excise duty of 8% (reduced in the Budget for 2004-05 from 16%) in addition to the sales tax applicable to dressed and sealed products.

Exhibit 4.5.1: Impact of taxes on processed chicken nuggets	
Components	Price / Cost (INR / Kg)
MRP	189.0
Margins (Distributor + Retailer)	38.3
Margin (processor)	18
Sales Tax*	16.5
Octroi*	5.4
Selling & distribution	13.7
Packing	16
Processing	9
Excise	7.2
Total Input cost	64.7

Source: Poultry Processors Association
 *- For Maharashtra

Exhibit 4.5.1 highlights that 12% of MRP, in value-added meat products, is due to taxes. This anomaly between 'wet market', 'packaged & branded' and 'value added packaged & branded' products needs to be removed.

It must be mentioned that the Government does not obtain significant revenue from taxation of these products. The total excise collection on 'Preparations of Meat, of Fish or of Crustaceans, Molluscs, or Other Aquatic Invertebrates' in 1999-00 was INR 17.8 mn.

It is recommended to reduce taxation on poultry meat products including on value-added products to zero to provide a level playing field for branded players with wet markets and Incentivise processors to invest in building scale and investing in the supply chain. This, in turn would promote growth of the sector.

Currently, there are no reputed Indian producers of poultry processing equipment. This is also linked to the fact that the industry is in its nascent stages and there are only about 10 reasonable sized processing plants. Most of the machinery is imported. This is subject to an import duty of 40-45%. Waiving of this duty can reduce costs further.

4.6 Animal productivity

Indian animal yields are very low compared to international averages. For example, average mutton yield in India is 70% of world average. Further there exists wide variation in meat yield from buffaloes across different states. This indicates considerable potential to increase meat production levels through yield improvement

measures.

A. Buffalo breeds and rearing

Goat and sheep breeds in India have been segregated based on their main utility, i.e. for meat, milk, fibre etc. However the same practice is not yet common in buffaloes. For example, the Jafarabadi breed in Gujarat and Maharashtra is known to be one of the heaviest buffalo breeds in the world but its yield is low. Such breeds could be developed and marketed as meat breeds. Similarly, farmers need to be educated on modern scientific methods to fatten male buffalo calves (which are often slaughtered / starved when farmers do not find them useful for draught purpose) for earning superior margins. It is prudent to mention here that despite slaughtering of male calves / buffaloes, buffalo population has been growing at an annual growth rate of 1.7%.

B. Human resources

For achieving all the above mentioned improvements in rearing, animal productivity and processing methods, and to meet the increasing demands from export of animal meat, India needs to devote more resources to training of manpower for the meat industry. A National Research Center on Meat has been established under ICAR with 6 scientists. However, this sector requires a larger pool of research resources. Further, the Central Government should commence partnering with private players to undertake research which is relevant to the industry.

4.7 Vision, strategy and action plan

India is likely to be among the fastest growing meat consumption nations, due to rising affordability, population growth, and conversion from vegetarianism. Per capita consumption of poultry in India is low compared to other parts of the world, as seen in Exhibit 4.7.1.

Exhibit 4.7.1: Global poultry consumption				
Consumption (m tonnes)	2002	1992	CAGR	Per Capita Consumption
China	13.7	5.1	10%	10.8
European Union (15)	8.2	6.8	2%	21.7
Area of former USSR	1.4	2.6	-6%	5.9
Brazil	5.5	2.5	8%	32.3
India*	1.3	0.4	13%	1.2
Japan	2.0	1.7	1%	15.7
Thailand	0.9	0.9	1%	15.4
United States of America	14.2	11.3	2%	50.4

*Based on data as revised by USDA, Source: FAO

The processing level for buffalo meat is assumed to increase from 21% to 35% in 2010 and 45% in 2015. Similarly, the processing level of poultry is assumed to increase from 6% to 15% in 2010 and 25% in 2015. This translates into market potential of INR 86 bn for buffalo meat and INR 105 bn for processed poultry in a ten-year time frame. This requires an investment of INR 17 bn in buffalo meat and INR 2 bn in poultry processing.

Exhibit 4.7.2: Market potential and investment: meat & poultry

	Current Volume (Million Tonnes)	Average Price (INR / Ton)	Current value (INR Million)	Current Growth (%)	Volume 2010 (million Tonnes)	Value 2010 (INR Million)	Volume 2015 (Million Tonnes)	Value 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)	Current Capacity (Tonnes / day) & Utilizatio (%)	New Capacity required (2005-10) Tonnes/day	New Capacity required (2010-15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2010-15) INR Million	Total Investment (2005-15) (INR Million)
Buffalo meat																
Production	1.9	30000	57000	6%	3	85707	1	11/696	6%	6%						
Processed	0.4	50000	20000		1.0	49996	1.7	86021	14%	11%	2667	2095	2407	7960.4	9146	17107
Share of Processed (%)	21%				35%		45%				50%	70%	80%			
Poultry meat																
Production	1.5	55000	82500	11%	3	171283	5	288622	11%	11%						
Processed	0.085	80000	6800		0.5	37371	1.3	104954	28%	23%	944	1280	3242	640.0	1621	2261
Share of Processed (%)	6%				15%			25%				30%	70%	80%		
Total Processed	0485		26800		1.47	87367	3.03	190975						8600	10767	19368

Summary of recommendations

A) Poultry

- Ban street-side slaughter of all small animals, commencing with the metros and later in other cities. Replace the current system with city-wise common slaughtering, rendering and effluent treatment plants. These can feed all the existing retail outlets through innovative, low-cost chilled transport and storage.
- In-quota tariff rate on maize should be brought down to 0% and imports to be subject to the actual user condition. This change in the import policy on maize would also prevent hoarding of stocks by traders and can prevent maize prices from reaching very high levels.
- Safety net for the farmer- Revise poultry insurance schemes to address the needs of the farmer.

B) Large animal meats

- Privatisation of all municipal slaughter houses (private parties to be invited through tendering process to upgrade and operate the slaughter houses). The guidelines for operating the slaughter houses would be laid down by the Government. These guidelines would include animal welfare standards, commercial interests of the private party and quality and hygiene aspects.
- Speedier clearance for private slaughter houses through guidelines that allow private houses to set up their own slaughter units inside the premises of the municipal slaughter houses.
- Livestock markets need to have strict guidelines for providing adequate facilities for animals and men (water, shelter etc) and should provide veterinary support too. Further, the guidelines should ensure that the transactions are undertaken in a transparent manner
- Most countries are moving away from physical livestock markets to direct sale agreements between the processor and the farmer. The same would be possible in India, only if the ban on rearing buffaloes for slaughter is removed.

C) Meat and poultry

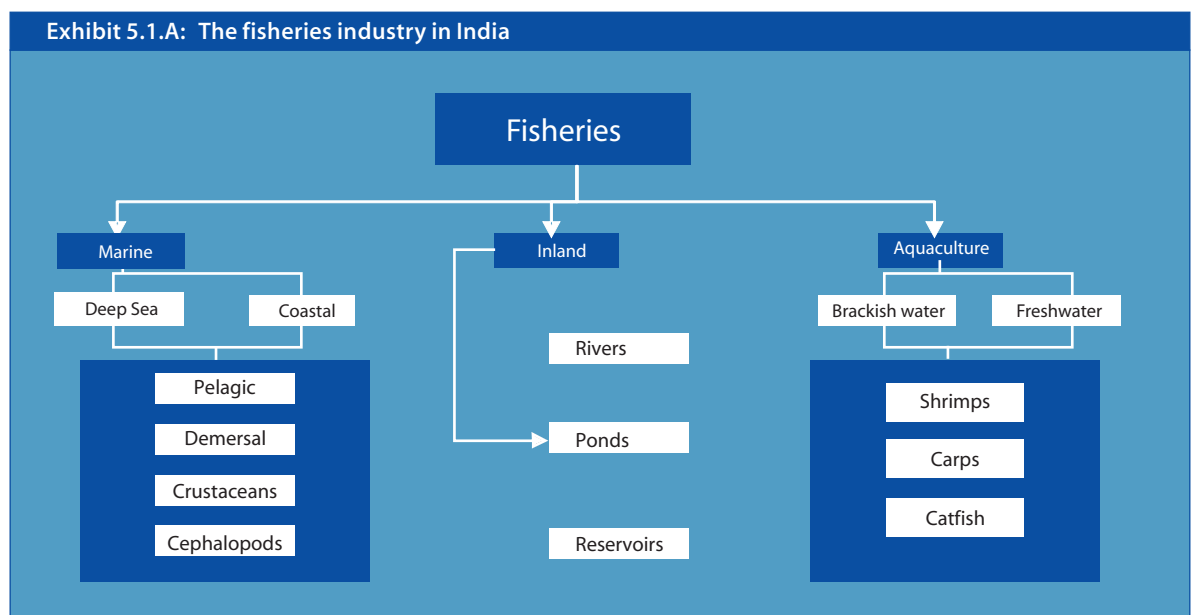
- MFPO needs to be amended to meet the changing requirements of the industry. It needs to be extended to cover meat as well as meat products irrespective of the extent of value addition. Further, our food safety standards need to be aligned internally (between the various administering agencies) and with international standards laid down by Codex and OIE.
- Nil excise and state-level taxes on value added and branded products to provide a level playing field with wet markets
- There is a need to enhance pool of manpower resources for research in this sector. The Government should consider partnering with the private sector in research initiatives.
- The action plan is as follows:

Central Government	<ol style="list-style-type: none"> 1. Reduce in-quota tariff rate on maize to 0% available to actual users 2. Ban on rearing buffaloes for slaughter needs to be removed explicitly 3. MFPO needs to be amended to cover meat as well as meat products and align it with Codex and OIE standards 4. Zero excise on packaged/value added products 5. Relevant poultry insurances schemes need to be introduced 6. Develop and propagate fast growing meat breeds suitable for different agro climatic conditions for higher production 7. Greater focus on research and development in the sector focus on enhancing research resources and public private research partnerships
State Government / Municipal authority	<ol style="list-style-type: none"> 1. Ban street side slaughter of all small animals in all metros. 2. Privatised all municipal slaughter houses; while laying down strict conditions to ensure hygiene and reasonable slaughter fee 3. Lay down strict timelines within which clearances for private slaughter houses are to be provided 4. Zero indirect taxes on packaged/value added, branded products

Fisheries

5.1 Overview

The fisheries sector in India can be classified as marine, inland and aquaculture. India has a coast line of 8118 sq. km. with an Exclusive Economic Zone (EEZ) of 2.02 mn square Km and 0.5 mn sq. km. of continental shelf. In the inland sector, the resources comprise of over 2.38 mn hectares of ponds and tanks, 2.03 mn hectares of reservoirs, 0.19 mn km of rivers and canals, and 1.4 mn hectare of brackish water area, the potential of which can be tapped through capture and culture fisheries.



Source: Rabobank analysis

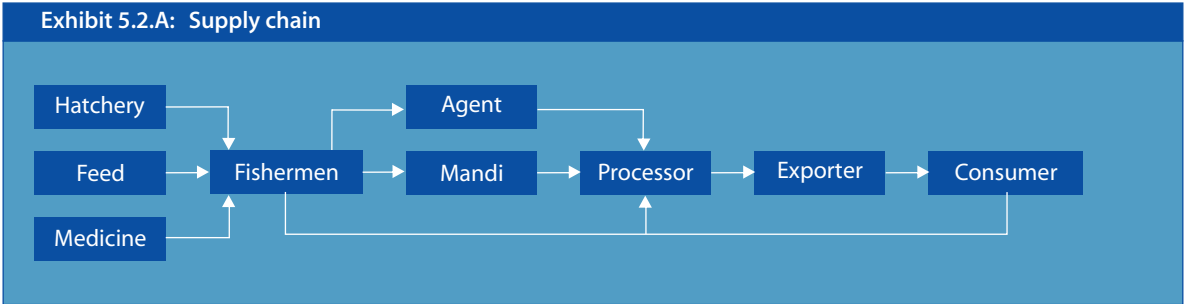
Of the total fish production, 62% is on account of capture production and 38% is on account of aquaculture. Marine fish in India primarily include shrimps, finfish, tuna, cuttlefish, squids, octopus, red snappers, ribbon fish, mackerel, lobsters, and cat fish. Of the total, 60% is obtained from marine sources, with coastal fishing constituting the bulk. Deep sea resources account for only 12% of the output.

5.2. Fisheries supply chain

The supply chain in the fisheries sector is depicted in the following exhibit. Predominantly, producers sell their catch directly to consumers via wet markets. The alternate channels for distribution are:

- Via commission agents, who in turn sell to the processor
- Mandi / market yard

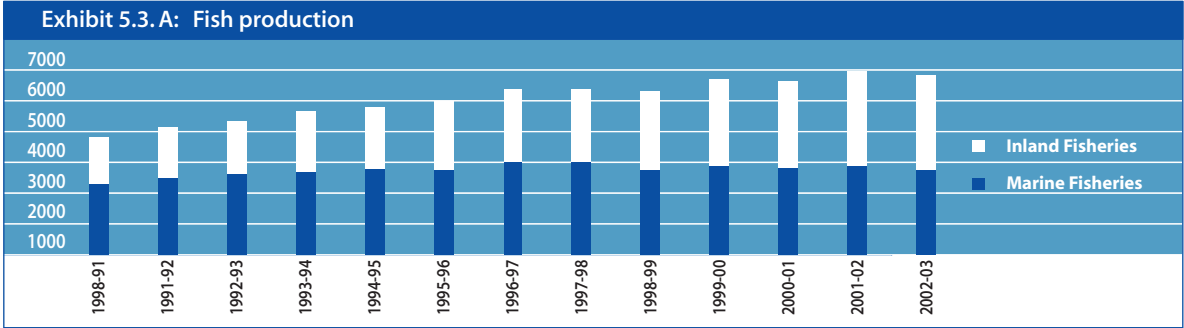
¹¹ The area within 22 km of the coast line is demarcated as state territorial waters and forms part of coastal fisheries. The area beyond the territorial waters forms part of the EEZ and is considered as deep sea fishing.



relevant only for aquaculture

5.3. Production

The following exhibit highlights the share of marine & inland fisheries over the years.



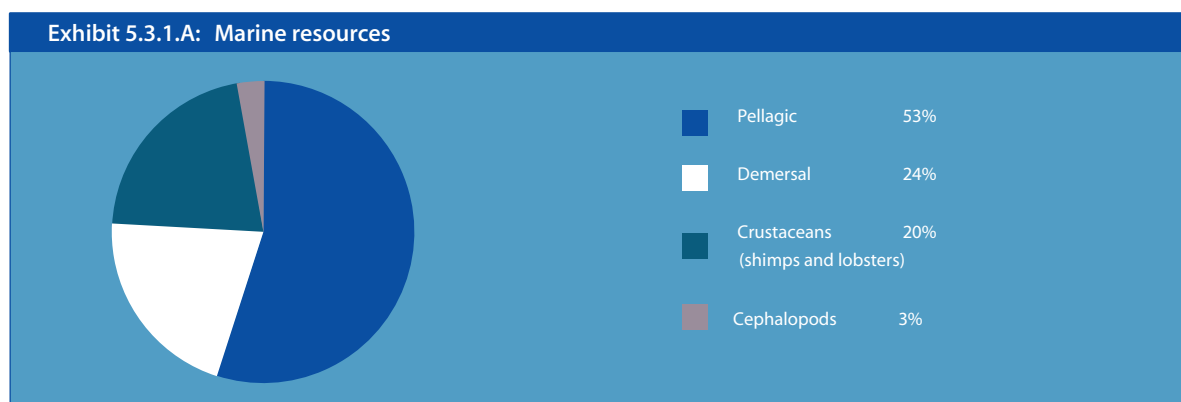
Source : Rabobank Research

During the last decade, marine fish production has grown marginally at about 0.4% from 2.6 million tonnes in 1992-93 to 2.7 million tonnes in 2002-03. Marine production had peaked during 1997, with an annual catch of 2.9 mn tonnes. The inland fisheries have grown at 6% CAGR from 1.7 mn tonnes in 1993 to 3.1 mn tonnes in 2003.

5.3.1. Marine fisheries

The marine fisheries segment can be segregated into Deep Sea fishing and Coastal fishing. The Indian marine fisheries sector is characteristically open access, with free and common property rights. The multi-species fisheries comprises of over 200 commercially important finfish and shellfish species. Mackerel, penaeid prawn, clupeids, sciaenids and perches are the dominant species in Indian marine waters.

Marine resources comprise four types of fish as depicted below:



Source: MPEDA, Rabobank International

Exhibit 5.3.1.B: State-wise marine fishery resources (2002-2003)

States/UTs	Continental Shelf (' 000 Sq Kms.)	Number of Landing Centres	Number of Villages	Approximate Length of Coast Line (Kms.)
Andhra Pradesh	33	508	508	974
Goa	10	88	72	104
Gujarat	164	190	190	1600
Karnataka	27	29	221	300
Kerala	40	226	222	590
Maharashtra	112	184	395	720
Orissa	24	67	589	480
Tamil Nadu	41	362	591	1076
West Bengal	17	65	652	158
Andaman & Nicobar	35	57	45	1912
Daman & Diu (P)	-	7	31	27
Lakshadweep (P)	4	11	10	132
Pondicherry	1	28	45	45
Total	508	1822	3571	8129

Source: State/ UT Government Publications

The EEZ of India can be divided into the following regions:

Exhibit 5.3.1.C: EEZ Regions

S. No.	Region	States
1.	North West Coast Region	Gujarat & Maharashtra
2.	South West Coast Region	Goa, Karnataka & Kerala
3.	Lower East Region	Tamil Nadu, Andhra Pradesh & Pondicherry
4.	Upper East Coast Region	Orissa & West Bengal

The EEZ of the West coast comprises 42% of total area, while the East coast comprises 28% of the area. The Andaman and the Nicobar Islands comprise the remainder. There is excessive fishing capacity with an estimated 47,000 trawlers in the Indian seas. Though the fleet size has remained constant for some time, the intensity of fishing has increased. The boats and trawlers have been modified with increased storage capacity and as compared to overnight fishing trips undertaken by the fishing community earlier, the fleet stays over for a longer period during fishing trips and only returns after an optimum level of catch is obtained. Hence the productivity of the catch has increased by 2-3 fold. In addition, a significant proportion of juvenile fish which are caught, are discarded.

Exhibit 5.3.1.D: Present exploitation and potential of marine fisheries (By Type)		
Category	Production(million tonnes)	Potential (million tonnes)
Demersal	1.93	2.21 (upto 50 m depth)
Neritic Pelagic	0.14	1.69 (> 50 m depth)
Oceanic Pelagic	0.25	
Total	2.32	3.90

Source: MPEDA

1. Key Issues in production : Marine sector

A. Depletion of stock

- Juvenile fish are being caught despite a regulatory ban. Further, there are no regulations to prevent fishing in shallow waters and on net size.
- Lack of implementation of ban on fishing in coastal waters during the breeding season
- Use of extensive fishing techniques with modern equipment leads to accelerated exploitation
- It is estimated that 30% to 40% of the catch is discarded by fishermen in high seas, as it is juvenile fish, which would not fetch an attractive price. This results in huge wastages and premature degradation of stock
- Lack of surveillance of territorial waters and other international fishing territory, which results in excessive or illegal fishing by international trawlers.

The above trends have a serious impact on the ecological balance and will likely impact sustainability of species.

B. Investment, knowhow and Infrastructure

- There is need for investment in infrastructure in long line trawlers, with on board freezing facility to quick freeze the catch. In the absence of these, there is significant wastage and/or deterioration in quality.

- Investments are required in landing centres, cleaning and grading facilities
- Lack of farmer knowledge of fishing techniques in deep waters, which can aid in widening the product mix and reduce reliance on few species
- Lack of technology of long trawlers and fishing techniques in deep waters

C. Deep sea fishing and investment in tuna and squid fishing

- Lack of commercial fishing in the EEZ exceeding depth of 400 m, due to non-availability of technology for detection of the stock, vessels fitted with special fishing gear
- Lack of financial schemes to support modernization of vessels

5.3.2. Inland fisheries

The potential of inland resources can be tapped through capture and culture fisheries. It is estimated that the total resources on full utilization of the inland sector can yield about 4.5 million tonnes of fish per annum. Inland fisheries provide 54% of total national fish catch and are the major food source for local communities. Inland fisheries cover resources of rivers, ponds and reservoirs. Capture fisheries had been the major source of inland fish production until the mid eighties. However, with the advent of culture practices, these now contribute about 75% of production. The preferred species, driven by consumption trends, are catfish, carps and snake heads. Normally, inland water fish are consumed locally. The scope for exporting these varieties is limited.

West Bengal has the highest production from inland fisheries contributing 0.9 million tonnes, followed by Andhra Pradesh (AP) at 0.47 million tonnes. However most of AP's inland production comprises of shrimp aquaculture.

1. Key Issues in production- Inland fisheries:

A. As in the case of marine fisheries, there is significant depletion of stock on account of the following:

- No regulation on the net size to be used in rivers, lakes and reservoirs.
- High incidence of juvenile fish being caught in inland waters
- No regulation to restore fish stock during the breeding season

B. Lack of scale of operations- Fish production is a highly fragmented activity. Few farmers, with the exception of those engaged in culture production, have a commercial approach. This fragmentation has an impact on the farmer's ability to:

- Procure fish seed at reasonable prices and quality for commercial cultivation
- Access technology for superior production/post-harvest management

- Integrate downstream with processors
- Invest in post harvest storage facilities

C. Lack of quality inputs

- Lack of fish seed at reasonable prices and quality for commercial cultivation
- High cost of fish feed and lack of proper knowledge on the feeding pattern
- Lack of regulation on the quality of feed, medicines and antibodies for the aquaculture segment, has resulted in flooding of the market with low value and spurious products

D. Technology and Technical know-how available to the farmers

- Non-availability of suitable fish yield models for multi-species fisheries for open inland waters
- Lack of fresh preservation techniques for transfer and transportation of fresh fish

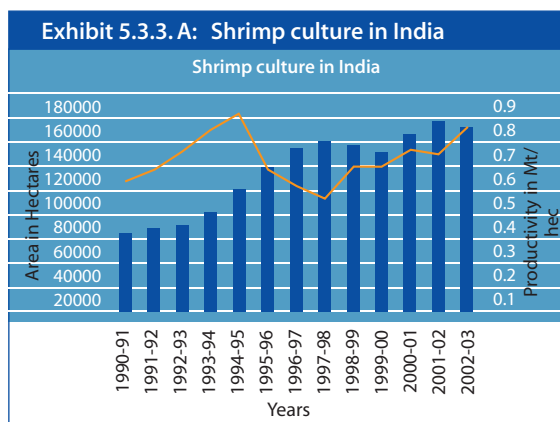
E. Socio Economic issues in terms of integration of fisheries with other operations

- Weak multi disciplinary approach
- Lack of commercial approach as a significant proportion of farmers are small/marginal, with limited access to best practices in cultivation, post-harvest management etc.

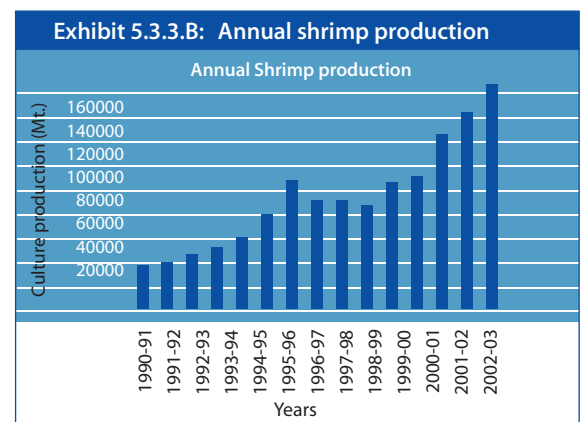
F. Further, lack of adoption of hygienic practices for waste disposal, can have severe environmental implications

5.3.3. Shrimp aquaculture

Shrimp aquaculture is part of both marine and inland fisheries. On a resource classification basis, the aquaculture sector covers freshwater culture, brackish water and marine culture. Two types of shrimps are cultivated in India, Tiger Shrimp (*Penaeus Monodon*) and Chinese white or Pacific white shrimp (*Penaeus vannamei*). Cultured shrimps/freshwater prawns contribute nearly 60% of marine exports by volume. However, in value terms, their contribution is higher at 82%.



Source: MPEDA



Source: MPEDA

The area under shrimp production has increased at a CAGR of 6.7% over the period 1990-91 to 2002-03. The production of shrimps has grown faster at 11.5% over the same period. Brackish water shrimps account for 79% of production, the balance being scampi culture.

1. Key Issues faced in the Shrimp Aquaculture sector:

A. Brooder stock

- Lack of availability of disease free brooder stock.
- Lack of regulation on import of brooder stock, due to which there have been several incidences of import of infected stock which in turn has a ripple effect on production and exports.
- Lack of infrastructure required for distribution & storage of brooder stock, in terms of stock holding facilities in the marine waters and transportation facilities of live stock

B. Policy and Regulatory Issues

- The registration process of the aqua firms by the Aquaculture Authority requires the application to be approved by the State Fisheries Department. Often, the state departments are reported to have taken 3-6 months to scrutinize documents, thus resulting in delays in project implementation.

C. Quality

- Antibiotic trace is a key factor for rejection of Indian shrimps in the EU and the US. Despite the above, as many as 24 banned antibiotics are used in culture production in India, on account of lack of requisite regulations. This has also spawned a thriving spurious products market. A periodic audit of ponds is required to align culture practices with requirements of importing countries.

D. Other Issues

- Lack of crop insurance for the aquaculture crop.

Exhibit 5.3.3.C: Cost profile of shrimp farms				
Particulars	Size of shrimp farm			
	< 2 hec.	2 5 hec.	> 5 hec.	All farms
Gross income (INR mn)	0.212	0.242	0.233	0.233
Yield Kg./ha	765	793	730	740
Seeds	17.5%	15.4%	18.4%	17.9%
Feed	43.6%	53.4%	51.2%	51.1%
Labour	13.6%	10.1%	9.7%	10.0%
Fertilizers	0.3%	0.6%	1.1%	1.0%
Chemicals for pond preparation	3.4%	2.4%	2.3%	2.4%
Hormones and vitamins	0.5%	1.0%	0.2%	0.4%
Fuel	6.1%	4.0%	5.4%	5.2%
Rent (farm & equipment)	2.4%	1.8%	2.9%	2.6%
Depreciation and Interest *	10.9%	8.9%	8.2%	8.4%
Incidentals	1.7%	2.4%	0.6%	1.0%
Total cost (Rs in million)	0.097	0.115	0.096	0.098
Net Income (Rs in million)	0.115	0.127	0.137	0.135
Cost Benefit Ratio	2.19	2.1	2.43	2.37
Cost (INR /Kg)	127	145	131	133
Price (INR /Kg)	277	305	319	314

Source: Industry Estimates

* Depreciation @ 10% & interest @ 10%

As feed cost accounts for 50% of the total cost, investment in research for low cost feed and technology by the Central Government can be an important means of enhancing sustainability of this sector.

5.4. Processing

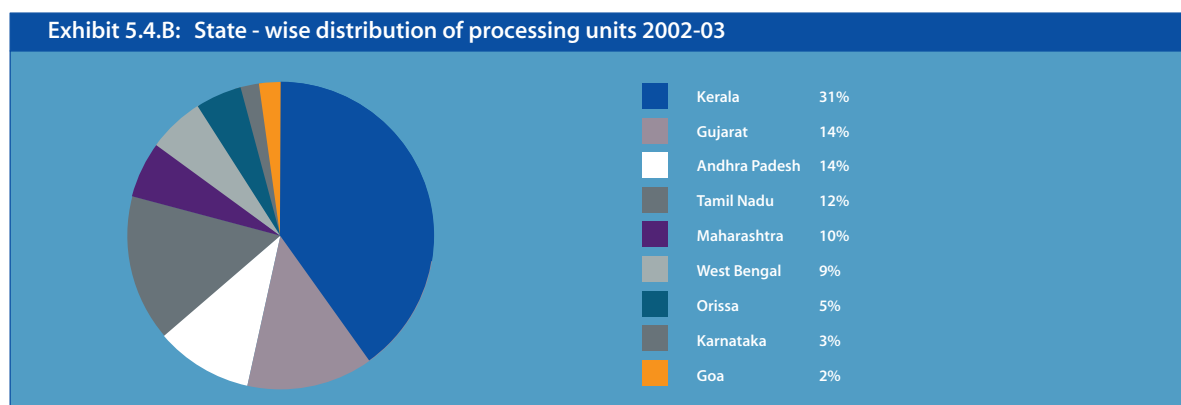
The processing segment of the fisheries sector in India is entirely export-oriented. Fish processing for domestic consumption is rare, as consumers prefer to purchase fish from wet markets and process it at home. Industrial processing is primary, even for exports, comprising of conventional block frozen products, individual quick frozen products (IQF), minced fish products like fish sausage, cakes, cutlets, pastes, surimi, texturised products and dry fish etc.

A large proportion of shrimps, tuna, crustaceans and molluscs are imported in chilled and frozen form, for further processing, by destination countries. The high end processed products in international market include tempura, sushi shrimps, prepared and preserved marine products, dried, salted and brined products and steamed and boiled products. Ready to eat marine products are not exported in significant volumes, due to varied tastes and cuisines in different regions. The largest importer of prepared and preserved shrimps and marine products is the USA, followed by Japan and Singapore.

Exhibit 5.4.A: Processing capacity as registered with MPEDA		
	Number of Units	Capacity (MT)
Freezing plants*	388	8906
IQF plants	98	721
Canning plants	13	48
Ice plants	156	3155
Fish meal plants	12	229
Pre-processing plants	561	3302

Source: MPEDA

Most processing facilities are concentrated in clusters. The capacity utilization in these clusters is less than 30%. About 85% of existing processors are classified as small scale. In 2001, 80.5% of total fish were sold fresh, 4.5% were frozen and 5.8% were cured.



Source: MPEDA

The processed fisheries segment is not developed in the domestic market, due to the following reasons

- Well-established wet markets across the country, which sell a wide variety of products at cheap prices.
- Cost of processed products in comparison to wet markets is high due to high tax rates (Tax Incidence of 20% to 25% on account of state sales tax and excise duties), which translate into high consumer prices.
- Further, a large number of retailers are unable to sell processed fish products due to lack of appropriate temperature-controlled storage facilities

Adequate market development efforts are required to create awareness about the benefits of opting for branded, packaged products, which are more hygienic and of consistent quality.

5.4.1. Key issues in the processing sector

A. Power supply

- Lack of continuous and quality power to the industry

B. Water availability

- Potable water is not available at landing and cleaning sheds at the ports.
- EU specifies 62 parameters of water, and states the chemicals which can lead to contamination. If traces of these chemicals are detected, it can lead to rejection of these products. These hygiene factors should be taken seriously and adhered to.

C. Packaging

- There are lack of suitable packaging options for marine products. Focused research efforts are required to develop low-cost packaging for seafood products, both for the export as well as for domestic markets.

5.5 Fish consumption

Annual per capita fish consumption was 2.45 kg in 1983, which increased to 3.45 kg in the year 1999-00 at a CAGR of 2%. (Source: National Sample Survey). 35 per cent of India's population consumes fish. Wide regional variations exist in fish consumption across regions, states and income classes. The following exhibit provides the changing pattern in fish consumption across the rural and urban population.

Exhibit 5.5.A: Trends in fish consumption in different classes (1983 to 1999-00)

(Kg. per capita consumption)								
Class	Fish eating sample households				All sample house holds			
	1983	1987-88	1993-94	1999-00	1983	1987-88	1993-94	1999-00
Rural	6.97	7.54	7.23	9.12	2.39	2.73	2.77	3.35
Urban	8.01	8.57	9.18	11.05	3.87	4.38	4.81	5.48
All	7.30	7.86	7.90	9.79	2.45	2.78	2.93	3.45

Source: NSSO Database

Domestic demand for fish is likely to grow at an annual rate of 2.4 per cent between 2004 and 2010. The highest growth in demand is projected for major carps (3.9 per cent), followed by fresh water fisheries (3.8 %), pelagic low value and demersal low value (2.0 per cent each). Domestic demand for export-oriented fish products is likely to decline, on account of the expectation of higher selling prices. The domestic demand for fish will be in the range of 5.9-6.0 million tonnes in the year 2005 and about 7 mn tonnes by 2010

5.6. Fisheries exports

Marine exports were estimated at INR 68.8 bn in 2002-03. The export of marine products has undergone a shift from dried fish products in the 1960s, to canned products in the 1980s which has further evolved to frozen products in the 1990s. Shrimps account for 60% of exports by volume but 86% by value. Culture shrimps account for over 80% of shrimp exports.

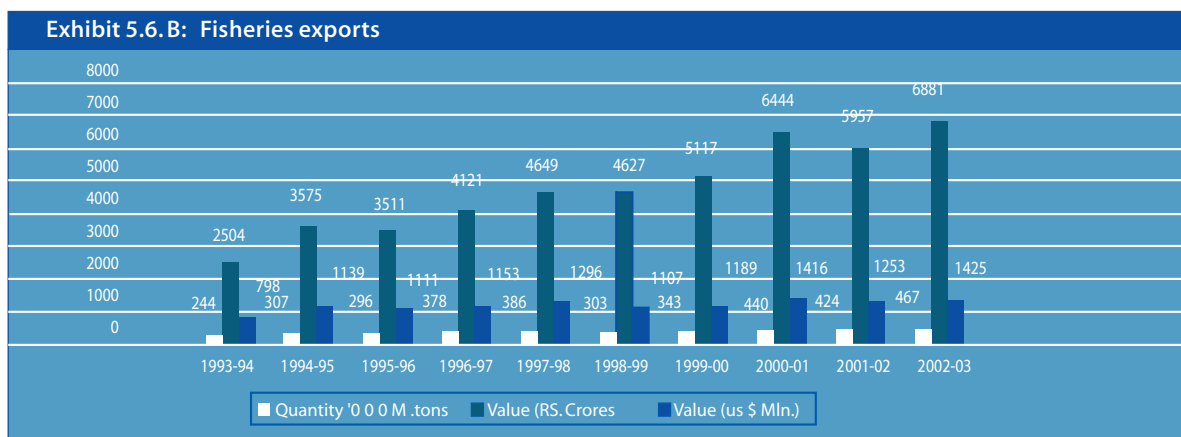
During the period 1990 to 2003 the culture shrimp sector has grown at a CAGR of 12.2% in volume terms. Other export segments include lobsters, cephalopods (squid, cuttlefish, octopus) and finfish (pomfrets, reef cods).

Exhibit 5.6.A: Share of cultured shrimps in total shrimp exports earnings (India)



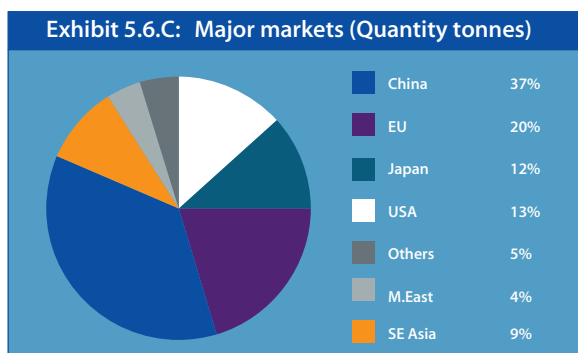
Source: MPEDA

Of total shrimp exports, 80% are in traditional block frozen form, primarily to China, Thailand and Vietnam. These are further processed in the destination country, either for local consumption or for exports. Value added products accounts for 1.5% of total exports.

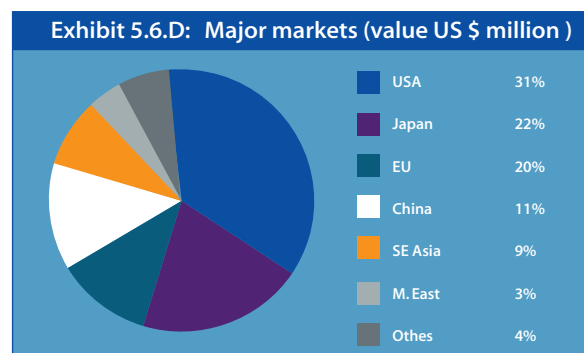


Source: MPEDA

Key markets for exports

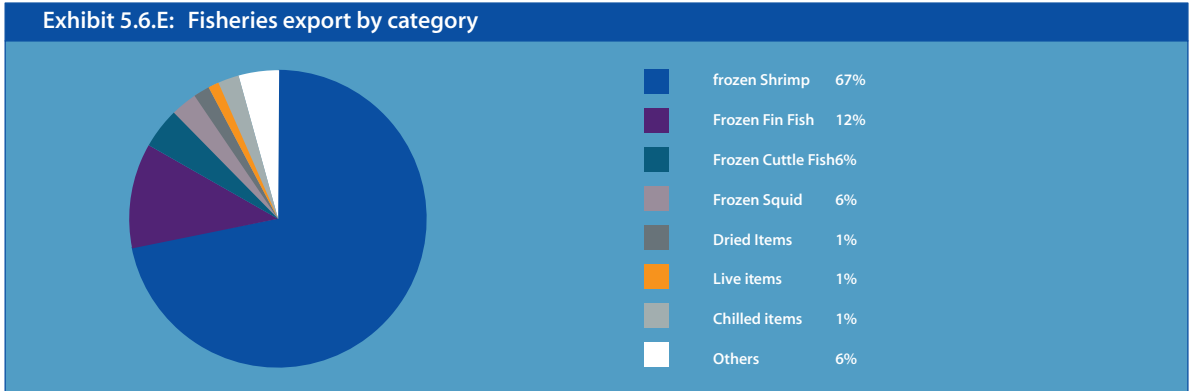


Source: MPEDA



Source: MPEDA

China is the largest export market in volume terms. In terms of value however, the USA is the largest market with an export of US\$ 424.5 million in 2002-03. This is on account of the product mix of exports- primarily low end products such as finfish are sold to China, while shrimps and crustaceans are sold to the US.



Source: MPEDA

There are about 1600 registered exporters in the Country. Of these, only 773 exporters are actively trading in the international market. A high proportion - nearly 70% have a turnover ranging between INR 0.1-50 million, and are classified as small or marginal exporters. In comparison, Taiwan's value of fisheries exports which is equivalent to that of India, is contributed by 70 exporters. This demonstrates the small scale of operations of Indian players in this sector.

Exhibit 5.6.F: Leading Indian exporters

	Company	Type of Exporter
1.	Ruchi Worldwide	Merchant Exporter
2.	Vishal Exports	Merchant Exporter
3.	Adani Exports	Merchant Exporter
4.	Hindustan Lever Ltd.	Producer Exporter
5.	Aditya Enterprises	Merchant Exporter
6.	Liberty	Producer Exporter
7.	Falcon Marine	Producer Exporter

Source: Rabobank Research

Some of the key issues faced in marine exports are:

- Limited value addition
- Lack of leveraging of opportunities such as exports of tuna, which can fetch superior realisations
- Anti -dumping issue for shrimps: For example, recently the US Department of Commerce has imposed an anti-dumping duty ranging from 3.56 per cent to 27.49 percent on Indian shrimps. The duties have been imposed in response to petitions filed by the Southern Shrimp Alliance, a lobby group formed by members of the US shrimp fishing industry, which filed an anti-dumping petition against six countries - India, China,

Thailand, Vietnam, Ecuador and Brazil.

- Cargo rejection on account of traces of antibiotics
- Issue of muddy and mouldy smell in shrimps
- Huge capital investments for upgradation of processing facilities to comply with EU & US norms. The cost of pre-export processing with and without HACCP compliance is depicted in the following exhibit:

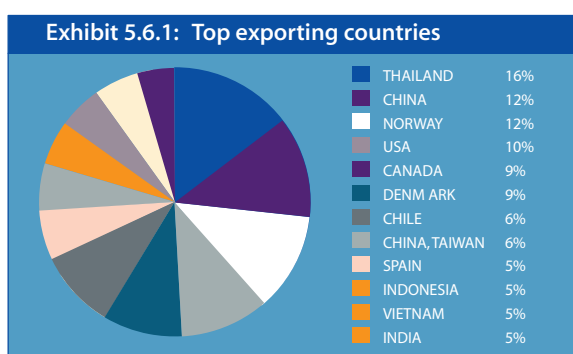
Exhibit. 5.6.G: Cost of pre-export processing (Rs./ kg)			
Categories	Without HACCP	With HACCP	Additional cost due to HACCP
Small (< 10 t/day)	7.84	18.21	10.37
Medium (10-15 t/day)	5.23	12.41	7.18
Large (> 15 t/day)	3.98	9.19	5.20
Overall	5.10	11.89	6.79

Source: Field survey undertaken for Fish 2020 project

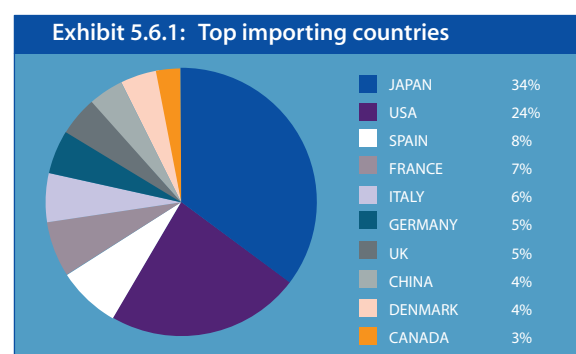
Global Fish Trade

About a third of global fish production is traded. Japan is the world's largest importer with a 34% share by volume. The main exporting countries are Thailand, China, USA, Canada and Norway.

- Tuna - This is the most important finfish in the international market. Tuna trade is dominated by exports from China and Latin America and major importing countries are Japan, USA and European Countries. Thailand is an emerging large producer of canned tuna. The main species are Skipjack (48% of world catch) followed by Yellowfin (34% of the catch), catches of Bluefin, Bigeye and Albacore are small. The Pacific Ocean is the primary source of Tuna, and accounts for 66% of world production. India, despite having availability of tuna catch in the Indian Ocean, does not have a significant share in the trade.
- Cod is a premium product in global fish trade. Russia is a major cod exporter with China being one of the largest importers.
- Salmon is important in the European countries and the US market, mainly originating from aquaculture.
- Shrimp - is the largest traded product in the international market and accounts for 20% of world fisheries trade. The major exporters in the world market are Ecuador, Brazil, Indonesia, China, Thailand, Vietnam and India. Black tiger shrimp production is dominant in the Asian countries, while white shrimp production prevails in the Latin American Countries.
- Freshwater fish such as perches, tilapia etc. have acquired increased importance in export markets



Source: Rabobank analysis



Source: Rabobank analysis

5.7. Schemes & plan allocation in the fisheries sector

5.7.1. Development programmes

The development programmes for India's fisheries sector are aimed at increasing fish production, improving the welfare of fishermen, promoting exports and providing food security. In 1952, a tripartite technical co-operation agreement was signed between India, the USA and the United Nations for fisheries development and a year later, the Indo-Norwegian Project (INP) in Kerala was started. Several programmes have been launched since, for both marine and inland fishery developments in the country, some of which are briefly described below:

5.7.2. Programmes for development of Inland fisheries

In recognition of the increasing role of inland fisheries in overall fish production, the Government of India (GOI) has been implementing two important programmes in the inland freshwater sector since the Fifth/Sixth Plans. These are the Fish Farmers' Development Agencies (FFDA) and the National Programme for Fish Seed Development. A network of about 429 FFDA are functioning covering all potential districts in the country. The FFDA have covered about 0.567 million ha of the total water area under scientific fish culture and trained 0.651 million fish farmers. This scheme was revised during the Ninth Five Year Plan by increasing the unit costs and adding new components such as freshwater seed prawn hatcheries, laboratories (at state level), soil and water testing kits to each FFDA, integrated units including hatcheries for ornamental fishes etc.

In coastal areas, 39 Brackishwater Fish Farmers Development Agencies (BFDAs) have been established; these provide a package of technical, financial and extension support to shrimp farmers. About 6240 ha was brought under brackish water aquaculture activities during the Ninth Plan through these BFDAs (Planning Commission, GOI). The performance of the programme has been affected due to environmental concerns. Under the national programme for fish seed production, more than 50 fish seed hatcheries have been commissioned. It has led to a marked improvement in the production of fish seed. Their production has increased from 409 million fry in 1973-74 to about 17000 million fry in 2000-01.

5.7.3. Programmes for development of marine fisheries

The programmes for development of marine fisheries as envisaged in different Five Year Plans include: (i) intensive surveys particularly of exclusive economic zone (EEZ), on marine fishery resource assessment, (ii) optimum exploitation of marine resources through a judicious mix of traditional country boats, mechanized boats and deep-sea fishing vessels, (iii) providing adequate landing and berthing facilities to fishing vessels by

completing the ongoing construction of major and minor fishing harbours, (iv) intensifying efforts on processing, storage and transportation, (v) improving marketing, particularly in the co-operative sector and (vi) tapping the vast potential for export of marine products. During the Seventh Plan a few villages were grouped for setting up "Fisheries Industrial Estates". The major developments include construction of 30 minor fishing harbours and 130 fish landing centres apart from five major fishing harbours viz., Cochin, Chennai, Visakhapatnam, Roychowk and Paradip. They provide landing and berthing facilities to fishing crafts. The Government also provides subsidy to poor fishermen for motorizing their traditional craft. Improved beach landing crafts are also being supplied to groups of fishermen. A scheme of reimbursing Central excise duty on HSD oil used in fishing vessels below 20 m length is also in operation to help small fishermen to reduce their operational cost. About 18,000 such vessels are being benefited per annum under the programme for the last few years.

5.7.4. Welfare programmes for traditional fishermen

The welfare programmes presently being carried out can be broadly divided into two categories: protective and promotional. The former is concerned with the short term task of preventing a decline in the standard of living, and the latter with enhancing the long term general living standard by improving the basic capability of the people. There are three key programmes for the welfare of traditional fishermen: (i) Group Accident Insurance Scheme for active fishermen (ii) Development of Model Fishermen Village and (iii). Insurance of INR 50,000 in case of death or permanent disability and for INR 25,000 in case of partial disability. About 1.22 million fishermen were insured during 2000-01 under this scheme. Under the programme of Development of Model Fishermen Villages, basic amenities such as housing, drinking water and community hall are provided to fishermen.

5.7.5. Programmes with international aid

Several international organizations, including the World Bank, UNDP, DANIDA, NORAD, ODA (UK and Japan) provide aid to India for the development of fisheries sector. Under the Bay of Bengal Programme (BOBP), commenced in 1979, assistance is provided for the development of small-scale fisheries and enhancing the socio-economic conditions of the fishing communities. ODA (UK) has provided technical aid for the prevention of post-harvest losses in marine fisheries. Recently, FAO launched a scheme for providing technical assistance to implement Hazard Analysis Critical Control Points (HACCP) in seafood processing industries. A Shrimp and Fish Culture Project was started with the assistance of the World Bank in May 1992 which continued until December 1999.

5.7.6. Plan allocation for fisheries sector

The outlay for the fisheries sector as per cent of outlay for the agricultural sector over the Five-Year Plans has increased from 1.45 % in the first Five-Year Plan to about 6.52 % in the sixth Five-Year Plan. In subsequent five year plans, its share was about 4-5%. This highlights the increased importance provided to the fisheries sub-sector within agriculture.

Exhibit 5.7.6: Outlay for fisheries sector during different five-year plans, India					
(INR bn)					
Five Year Plan	Total outlay	Outlay for agricultural sector	Outlay for fisheries sector	Share of fisheries sector (%)	
				Total outlay	Agricultural outlay
First (1951-1956)	23.78	3.54	0.0513	0.22	1.45
Second (1956-61)	45.00	5.01	0.12	0.27	2.45
Third (1961-66)	85.77	10.89	0.28	0.33	2.60
Annual Plans (1966-69)**	66.25	11.07	0.42	0.64	3.81
Fourth (1969-74)	157.79	23.20	0.82	0.52	3.56
Fifth (1974-79)	394.26	48.65	1.51	0.38	3.11
1 Annual Plan (1979-80)	121.77	19.97	-	-	-
Sixth (1980-85)	975.00	56.95	3.71	0.38	6.52
Seventh(1985-86 to 1989-90)	1800.00	105.25	5.46	0.30	5.19
2 Annual Plans (1990-92)	1231.20	72.56	2.92	0.24	4.03
Eighth (1992-93 to 1996-97)	4341.00	224.67	12.05	0.28	5.37
Ninth (1997- 2002)	8592.00	424.62	20.69	0.24	4.87
Tenth*(2002-07)	3988.90	206.68	7.65	0.19	3.70

Source: Handbook on Fisheries Statistics, Ministry of Agriculture, Government of India and Tenth Five Year Plan 2002-2007, Planning Commission, GOI.
*-Allocation of central funds only.

During the 10th Five year Plan, new initiatives for development of fisheries are planned to increase production and productivity from deep seas, inland capture fishery resources like rivers, canals etc. and from culture sources. Besides, development of infrastructural facilities for better post-harvest management, technology for suitable aquaculture, setting up of cold storage and marketing network through viable fishermen co-operatives etc. are to be taken up to ensure better livelihood for fishermen and enhance export promotion for economic development of the country (Tenth Five Year Plan, 2002-07 Documents, Planning Commission, GOI).

Some of the key issues which need to be addressed during the design of futures schemes in the fisheries sector are as follows;

- Directed schemes which provide financing support for processing/value addition, which can include the following

- Investments in plant and machinery
- Installation of packaging technology
- Market development & promotion in export markets
- Schemes for farmer education comprising cultivation technology and practices, hygiene, ecological and environmental preservation
- Schemes targeted at improving hygiene standards, which can cover testing facilities, cultivation protocol, disease free seeds etc, such that requirements of importing countries are suitably addressed.

5.8. Vision, strategy and action plan

The processing level in fisheries is expected to increase to 15% in 2010 and further to 20% by 2015. The value added segment of shrimp is expected to grow faster at 15% until 2010 and 12% subsequently to 2015. Robust growth is projected for processed marine products segment as well, driven by a mix of value and volume growth. This translates into a market size of INR 151 bn and INR 274 bn in 2010 and 2015 respectively

Exhibit 5.8A: Vision for fisheries sector											
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)
Frozen Fin Fish	0.200	42000	8417	2%		0.5	21000	0.8	33180	14%	10%
Processed marine products	0.200	100000	15000	2%	10%	0.4	72297	0.7	219690	14%	14%
Shrimp value added	0.150	500000	1025	10	10%	0.007	6821	0.014	21969	15%	12%
Shrimp Frozen	0.002	500000	46083	7%		0.225	73125	0.315	102375		
Total	0.142	325000	70525			1.103	1732243	1.819	377214		

The key measures that need to be undertaken, in order to achieve the stated vision include:

A. Marine fisheries

- **Enforcement of fishing holidays** - The State Governments needs to enforce fishing holidays. Further, awareness camps should be organized to educate the fishermen on importance of the breeding cycle of the

fish to replenish the stock.

- **Regulation of mesh size** Further, the mesh size should be regulated and 30 mm mesh size should be standardized for use. In addition, There should be promotion of square mesh and open mesh with off bottom drawls and semi pelagic drawls.
- **Promote deep sea fishing** - There should be scientific determination of deep sea fishing stocks, and the total quantum of resources which can be exploited without damaging the marine ecosystem. Further, the State Governments can announce specific financing schemes for purchase of requisite vessels and equipment.
- **Stem over-exploitation of resources** in order to stem over-exploitation of resources, the State Governments need to play an active role in ascertaining the total tonnage of different fishing vessels, and allow only a sustainable number of vessels to operate in the EEZ.
- **Facilitate upgradation of fishing vessels** Mechanisation of fishing vessels with freezing and processing technology can lead to improvement in quality of products and also reduce the incidence of high discards during fishing tours. State Government schemes should be designed for financing of upgradation of fishing vessels
- **Promote tuna and squid fishing** As highlighted earlier, there is tremendous potential to tap high growth markets such as tuna. Keeping in view the small scale of most players in this industry, it is the State Government which can play a lead role to promote tuna fishing through measures such as a) financing schemes for purchase of requisite equipment to locate tuna shoals, b) subsidize cost of bait, c) facilitate air transport to target markets and d) provide training to personnel for tuna fishing
- **Leasing of coastal zones** - There is need to consider leasing of coastal zones on a long term basis (30 years) to private sector players, for introduction of advanced mariculture technologies such as cage culture, pen culture etc. for augmenting fish production.
- **Industry information to exporters**- The Government can play an important role in providing information on global trends in demand and supply, regulatory requirements of target countries, resource potential etc., which can enable small and medium sized players to develop product market strategies in an effective manner.
- **Enhance availability of raw material**- There is immense potential for import of fish into India from neighbouring countries in South Asia and South East Asia. This will also enable existing processors to enhance capacity utilization, for re-exports. The Government can play a facilitatory role by redefining the Standard Input and Output Norms (SION).
- **Promote value-addition** There are several additives, which are required for value added products which need to be imported. Import duties on these products need to be reduced. Similarly, in the absence of suitable packaging options available locally, these containers/pouches need to be imported. It is recommended that these duties be reduced to 5%

Exhibit 5.8.B: Duty structure on ingredients

S.No.	Ingredient	Current Import Duty
1.	Breadcrumbs	30%
2.	Batter	30%
3.	Flavouring oils	100%
4.	Food Colours	25%
5	Flavouring Extracts	25%
7.	Pre-formed HIPS container	25%
8.	Polyurethane & Polystyrene containers meeting buyers requirement	25%
9.	Printed Plastic pouches for packing buyers brand	25%

Further, there are various capital goods/equipment for storage and cooling such as pre-cooler refrigeration units, cold storage panels etc. which need to be imported. It is recommended that the duty on these products be reduced from the current level of 25% to 5%.

- Surveillance of coastal waters The Government needs to step up its surveillance efforts to deter foreign vessels from fishing in Indian territories

B. Shrimp aquaculture

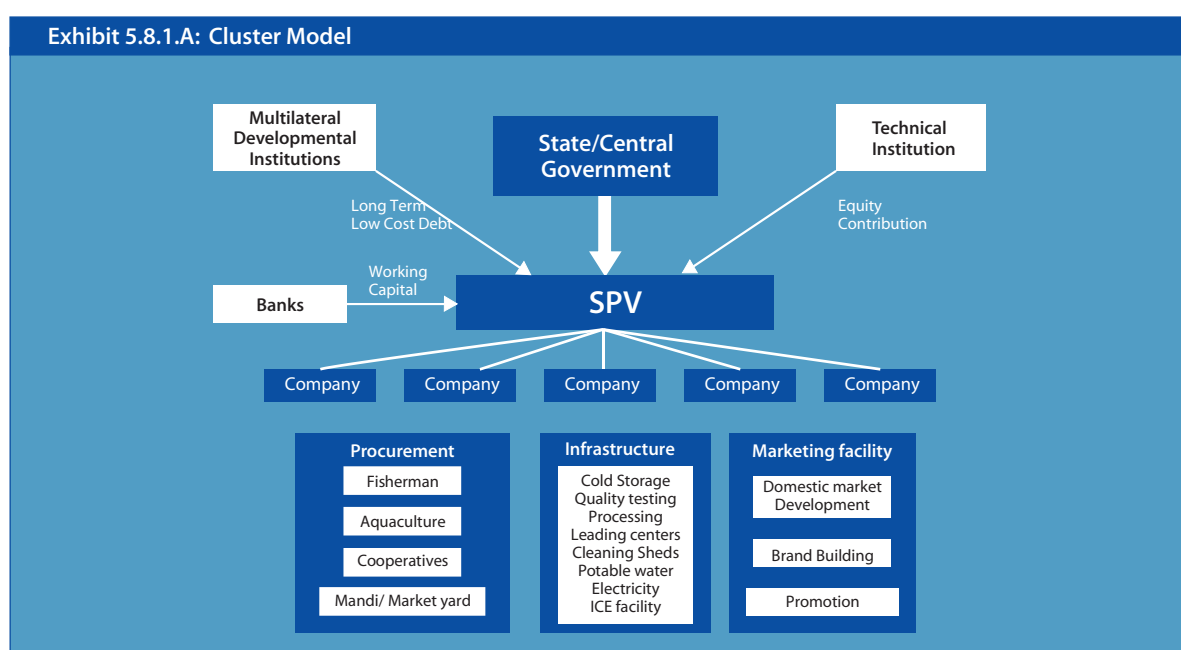
- All shrimp hatcheries and aquaculture units must be registered with MPEDA. It should be mandatory that only those units which are registered, can engage in exports. Registration can facilitate compliance with requisite norms on pesticide usage, prevent use of banned products etc.
- Enhance availability of quality brooder stock- Focused research efforts are required to develop disease free strains of brooder stock. Further, the state Government needs to create specialized facilities for holding of brooder stock at ports until inspection and quarantine are undertaken. Inspection of imported brooder stock should be made mandatory.
- Education of shrimp farmers It has been established that lengthening of the cultivation process and reducing the number of shrimps per hectare can enhance the quality of shrimps as well as result in higher body weight. Research institutions, together with the Government extension departments, need to organize specific training modules on cultivation practices for shrimp farmers. Further, farmers need to be advised on prudent usage of pesticides.

C. Inland fisheries

- Restrict over-exploitation of resources- as is the case with marine fisheries, it is important to restrict mesh size and adopt other measures to ensure that resources are not over-exploited
- Financing access to feed and technology- The inland fisheries segment is almost entirely comprised of small fishermen with marginal access to funds to finance fish feed or for technology upgradation. The State Government can play an important role in this area by designing specific financing schemes which are targeted at enhancing availability of feed and technology.
- Research and extension State-level research institutions, together with the state extension department, need to be actively engaged in ensuring that farmers adopt sustainable fishing practices
- Cluster approach to development of inland fisheries segment Scale is key to sustainable development of the inland fisheries segment. In this context, it is recommended that the cluster approach be adopted to promote increase in scale of operations of this segment.

5.8.1. Cluster model approach

The marine products sector is amenable to adoption of a cluster model for integration. Farmers can be organized into Producer Companies, which in turn can be integrated with a Special Purpose Vehicle (SPV). The SPV is owned in equal share by the Producer companies. The SPV will make available basic infrastructure such as processing, cold storage, quality testing, cleaning sheds, landing harbours, electricity, potable water etc. The SPV can be supported by the Central and the State Government through channelizing of grants and schemes.



The SPV can leverage the equity (Corporate contribution & Government grants) to raise funds in the market for infrastructure investment and to meet working capital requirements.

Some of the activities which can be undertaken by the SPV collectively for the companies are as follows:

A. Procurement : The SPV can facilitate sourcing on a collective basis with a common landing and cleaning facility. The SPV will be the conduit for dissemination of financial assistance by the Government, on the one hand, and provide consolidated produce to processors on the other. Funds can be allocated to each Producer Company to invest in upgradation of fishing vessels and in fishing accessories, in the form of loans at low interest rates. The Producers will have joint liabilities, providing guarantees for every other member.

B. Fishermen education: The SPV with the support of Research Institutions can create awareness among producers on quality parameters, impact of pesticide residues, restriction on usage of banned chemicals, disease incidence and cultivation techniques which can enhance the body weight of the shrimps/ fish in aquaculture and can help fetch higher prices, for the produce thereby providing an incentive for higher production.

C. Value addition: The SPV can access a common processing facility for value addition and can explore opportunities of introducing new products in the market with access to better technology and packaging facilities.

D. Market development: A collective marketing effort can generate sufficient resources for brand building for both the domestic and the export market. The SPV can also execute long term supply contracts for higher volumes with international players thereby creating an assured demand situation.

Investments are required in freezing and ice facilities, IQF, pre processing and cold storage units. The investment required is estimated at INR 15.8 bn until 2010 and INR 64.3 bn between 2010 and 2015.

The states with maximum potential for investments are West Bengal, Andhra Pradesh and Uttar Pradesh. The investment for intensive carp culture and semi-intensive and extensive aqua cultural technology would be in the states of Andhra, Haryana, Punjab and West Bengal.

Exhibit 5.8.1 B: Investment estimation						
	Current Capacity (Tonnes / day) & Utilization (%)	New Capacity required (2005-10) Tonnes/day	New Capacity required (2010-15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2010-15) (INR Million)	Total Investment (2005-15) (INR Million)
Freezing & Ice facility	12061	11011	14977	2202	2995	5197
IQF	721	529	582	1213	1335	2547
Pre Processing	3302	2823	4148	4235	6222	10456
Cold Storage	108800	6782	26197.3	8139	53768	61907
Capacity Utilization Cold Storage	60%	70%	70%	15789	64319	80107
Capacity Utilization Processing	30%	40%	45%			

The action plan can be summarised as:	
Central Government	<ul style="list-style-type: none"> λ Promote deep sea fishing λ Long term leasing of coastal zones λ Promote import of raw material/ingredients and local value addition through requisite changes in duty structure λ Registration of all aquaculture units with MPEDA λ Ensure requisite surveillance of coastal waters λ Market development and promotion efforts for growth of the processed seafood market in India λ Timely availability of information to exporters
State Government	<ul style="list-style-type: none"> λ Enforcement of fishing holidays λ Regulation of mesh size λ Restrict number of fishing vessels operating in the EEZ λ Financing schemes for upgradation of fishing vessels, investment in equipment etc. λ Promote tuna fishing λ Enhance availability of quality brooder stock λ Education of farmers to adopt sustainable fishing and culture practices λ Facilitate development of cluster model for inland fisheries

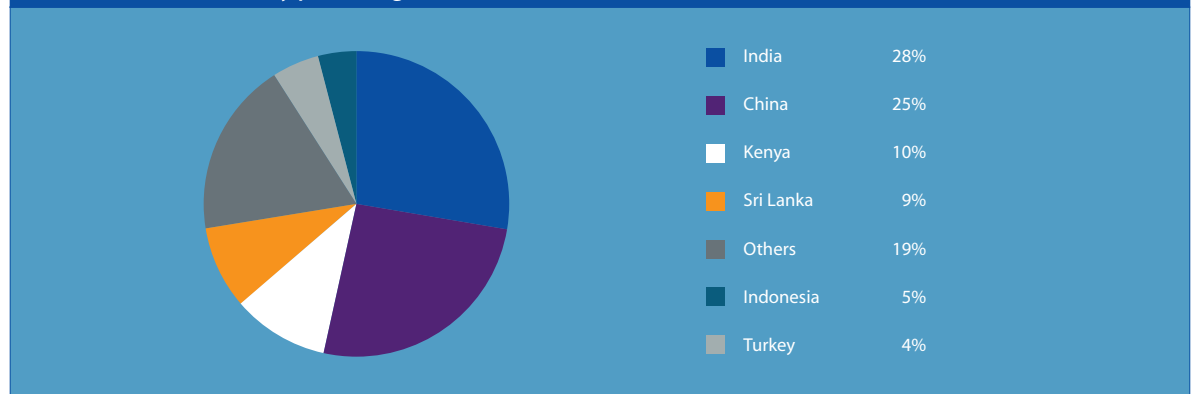
Non-Alcoholic beverages

6.1.Tea

6.1.1 Production

India is the largest tea producer in the world. With production of 857 mn kg, it accounted for 28% of global production. There are about 34 tea-producing countries in the world, mainly concentrated in Asia and Africa. Other major producing countries, besides India, include China, Sri Lanka, Kenya, Indonesia and Turkey. A highly labour and capital intensive enterprise, the concentration in production is primarily due to climatic and soil factors, and the availability of cheap manpower.

Exhibit 6.1.1.A: Tea - Key producing countries



Source: Rabobank, Industry

Indian tea production has grown at 1.2% CAGR over the last ten years. Area under tea cultivation in India has grown slowly (CAGR of 0.98%). However, in the last decade, the rate of growth has been higher exceeding 2%. Bulk of area expansion during the 90s was due to a large scale shift to tea cultivation by small farmers, in Assam valley, North Bengal, Bihar and Nilgiris in Tamil Nadu. However, with decline in prices, area expansion slowed down after 2002. The Land Ceiling Act has been the single biggest reason for the slow growth in area under tea cultivation in India. Under this Act, the Government acquired large tracts of then uncultivated land from tea estates. Further, the Land Policy of 1979 does not permit land with the government to be transferred to the corporate sector for cultivation. This has restricted growth in area under tea cultivation.

Exhibit 6.1.1.B: Area under Tea Cultivation

Area in 000 Ha	1993	2002	Inc/Dec in area (1993 -2002)
India	418	512	22
Kenya	109	140	28
Indonesia	125	155	24
Vietnam	70	83	19
Others	1804	1755	-3
World	2526	2645	5

Source: Tea Board

¹²Year 2004, Source: FAO

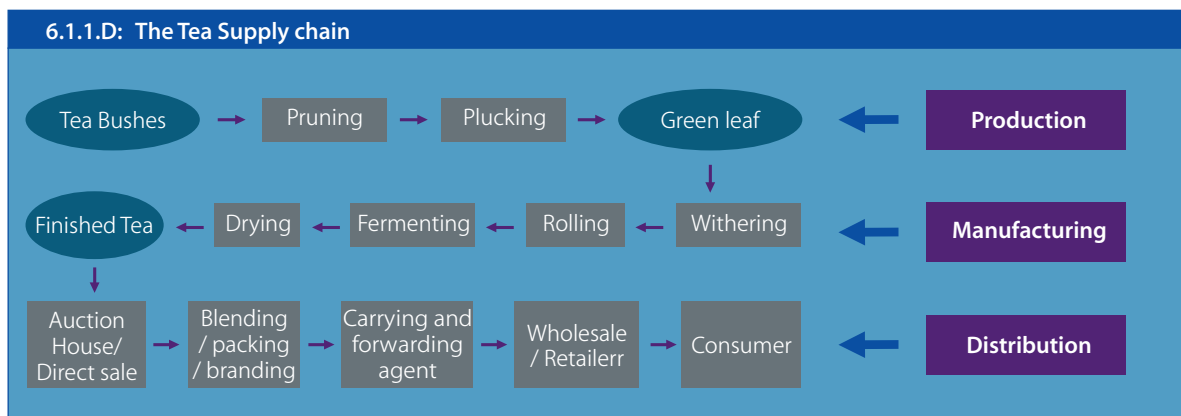
Exhibit 6.1.1.C: Tea in India- Area, production and yield			
Year	Area (Hectare)	Production (Thousand Kgs)	Yield (Kg./hect)
1990	416269	720338	1731
1991	420470	754192	1794
1992	420289	732322	1742
1993	418363	760826	1819
1994	425966	752895	1768
1995	427065	756016	1770
1996	431204	780140	1809
1997	434294	810031	1865
1998	474027	874108	1844
1999	490200	825935	1685
2000	504366	846922	1679
2001	509770	853923	1675
2002	511940	826165	1614

Source: Tea Board

A. Key producing states

Tea is primarily produced in four states in India- Assam, West Bengal, Tamil Nadu and Kerala. Teas produced in Darjeeling in West Bengal, Nilgiris in Tamil Nadu and Brahmaputra valley in Assam are acclaimed as the best quality teas in the world. In North India, tea is grown during the period March-December. In Southern India, tea is grown throughout the year.

North/East India (primarily West Bengal and Assam) account for over 75% of tea production, with the Southern states (Tamil Nadu, Kerala and Karnataka) contributing the balance. Assam is the single largest tea producing state in the country, accounting for more than 50% of total production.



Source: Rabobank

Quality of tea

The key parameters used to determine the quality of tea include aroma, taste, strength, brightness, colour and appearance. The quality of tea is determined by several factors such as quality of tea bushes (variety, age, health), location of cultivation, environment (soil, climate), farming practices (irrigation, use of fertilizers) and harvesting practices.

6.1.2 Manufacturing

A. CTC vs Orthodox tea

Approximately 89% of tea manufactured in India is of the CTC variety, while orthodox variety accounts for about 10%. The share of green tea is negligible, due to a limited domestic consumer base. The share of the CTC variety has increased from 64 % in 1981 to 89% in 2002, due to rising domestic consumption, which has resulted in a shift towards cultivation of the higher cuppage-yielding CTC variety. In the domestic market, consumers prefer CTC over orthodox tea.

Exhibit 6.1.2.A: Tea manufacture by type						
Indian Production (M Kg)					Orthodox % of Total	Green Tea % of Total
Year	CTC	Orthodox	Green Tea	Total		
1961	121	208	5	353	59	1
1971	239	188	8	435	43	2
1981	357	196	8	560	35	1
1991	604	141	10	754	19	1
1998	759	104	7	870	12	1
1999	746	71	7	824	8	1
2000	758	80	8	846	9	1
2001	758	89	7	854	10	1
2002	732	87	7	826	10	1

Source: Tea Board

As against the above, the share of orthodox tea in total world production is much higher at 36%. Green tea also has a larger share of about 14%. The share of CTC is the highest, at about 50%.

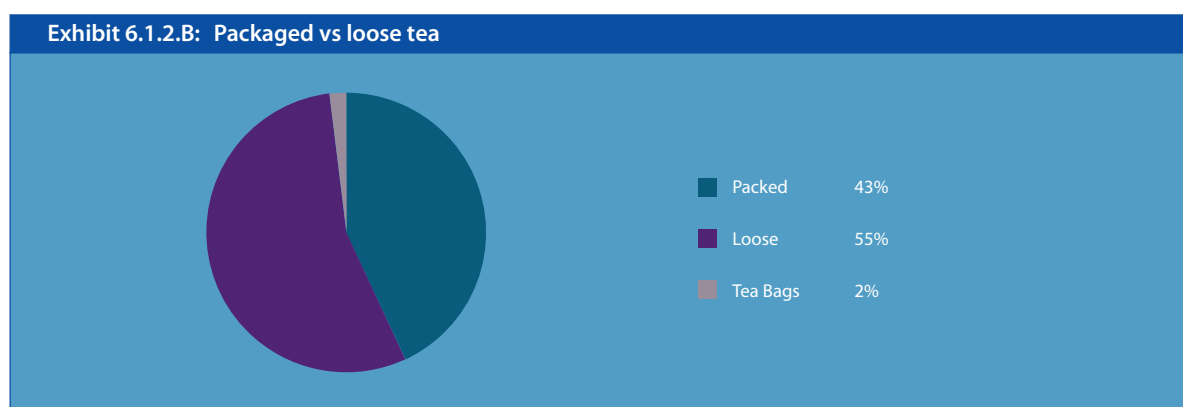
B. Packaged vs loose tea

Tea is either sold in a loose form or packaged form in the domestic and export markets. Packaged teas include instant teas and tea bags. Players in the loose tea segment have an advantage over packaged tea

companies, as they are not liable to pay sales tax and other state-level taxes.

The packaged tea segment grew at over 4% until the early 1990s. However in the last few years, the packaged segment has witnessed stagnation on account of the following:

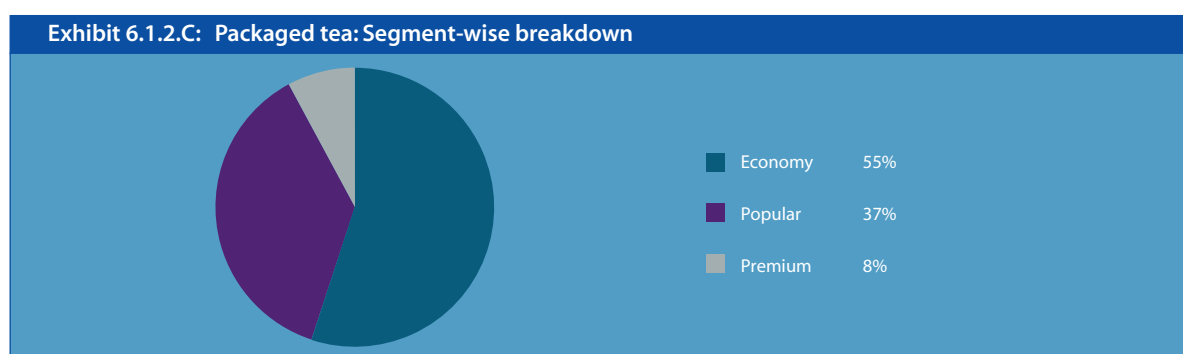
- Increasing competition from local marketers, who have far lower cost of production, on account of nil taxation
- Increasing competition from other beverages including coffee, juices etc. which are perceived to be more contemporary as compared to tea



Source: Industry, Rabobank Estimates

C. Packaged tea- Key segments

The packaged tea market in India, can be categorised into three broad segments:- economy (< INR130/kg), popular (INR 130-180/kg) and premium (>INR180/kg). The economy segment is the largest, accounting for over 55% of the market. The popular segment accounts for about 37% of the market. The premium segment is very small currently, accounting for just 8% of the market.



Source: Industry, Rabobank Estimates

6.1.3 Key issues - pre-processing

A. Ageing tea bushes

Around 47 % of tea bushes in India are above the productive age of 20-40 years. Tea gardens in Darjeeling are about 80-100 years old. In Assam, the tea gardens are relatively younger, with around 60 % of the tea bushes below 40 years of age, while 33 % of the bushes are below 20 years of age. In Kerala, around 80 % of the tea bushes are over 40 years old.

Exhibit 6.1.3.A: Trend in yields							
Region	1990	1991	1992	1997	(figures in Kg/Hectares)		
					2000	2001	2002
North India	1599	1631	1653	1749	1639	1647	1592
South India	2328	2540	2153	2318	1817	1771	1689
All India	1730	1794	1742	1865	1679	1675	1614

Source: Tea Board

This in turn translates into low yields and deterioration in quality of output, both of which impact selling prices. On account of significant pressure on profitability, most tea companies have not invested in estate upgradation through replanting, uprooting and cloning of high yielding varieties, which is the underlying cause for this age profile of Indian tea bushes. Upgradation of tea estates is the only means to arrest declining yields.

Exhibit 6.1.3.B: Tea Yield Comparison of leading producers			
	1993	2002	% inc/dec
India	1819	1674	-8
Sri Lanka	1415	1612	14
Kenya	2014	2100	4
Indonesia	1057	1084	3
Vietnam	539	940	74
The World	1011	1171	16

Source: Tea Board

A tea plant is most productive between 15 and 35 years of its planting. Although the productive life of a tea bush ranges from 80-100 years, yields of tea usually drop after 50 years, at which time the older bushes need to be considered for replacement.

B. High labour costs

The Plantation Labour Act 1951 lays down the requirement for tea companies to maintain a minimum number of employees and pay certain minimum wages. Further, they are required to provide other amenities to workers. Most plantation labourers are paid a time-cum-piece rate, which means that even when the worker does not complete his assigned task, his daily wages are assured. On an average, salaries to workers account for over 55% of total costs for plantation operations. As compared to this, other tea producing majors such as Vietnam and Argentina do not have such requirements. There is need to allow tea processors/manufacturers to determine the number of employees to be hired and various benefits to be provided, to ensure that tea companies are able to operate in a sustainable manner.

The Exhibit below provides a comparison of India's cost of production with other leading producers. As can be seen, India has the highest cost of production. The reason for this cost differential can be attributed to the huge difference in the labour component of total costs. Though 'direct' labour costs in India are only slightly higher than Sri Lanka and Kenya, India suffers from high 'labour welfare costs'. The percentage of welfare costs relative to the total cost of production in India ranges between 20%-25% as compared to 4.1% and 5.6% for Sri Lanka and Kenya respectively.

Exhibit 6.1.3.C: Comparative cost of production of tea		
	Cost of Production (US\$)	Labour cost/kg (US\$)
India	1.57	0.81
Sri Lanka	1.46	0.74
Kenya	1.16	0.55
Malawi	0.84	0.27

Source: Tea Board

The resulting increase in cost of production has rendered Indian tea producers uncompetitive at a time when leading tea producing countries are stepping up their effort to capture a larger share of tea exports. A large number of tea plantation companies have reported losses in the last down cycle of the industry and are caught in the trap of being unable to invest in upgradation through efforts such as cloning, replanting etc., which in turn impacts quality, selling prices and their ability to pay requisite salaries to their workforce.

C. Unequal advantage to bought leaf factories

North India is characterized by the presence of a large number of bought leaf factories (BLF), which account for nearly a fifth of this region's production. BLF companies own independent processing units, and procure leaf from small growers. As BLF owners do not have plantation operations, they are not subject to the

regulations laid down by the Plantations Labour Act. This places BLF players at an advantage, as their cost of operations, is far lower than that of plantation owners.

D. Taxation

The tea industry is liable for dual taxation. Under Section 8 of the Central Income Tax (CIT) Act, 40 % of the industry's taxable income is subject to corporate income tax, while the remaining is taxed as agricultural income at much higher rates by the respective state governments. The rates for agricultural income tax vary from 30% in some states to as much as 60% in others. This has impacted profitability of tea companies adversely. However, an enabling provision has been made in the Income Tax Act in section 33 AB which provides for tax exemption up to 40% of the taxable income provided the said amount is deposited with National Bank (NABARD) and thereafter utilized for investment in development activities as specified in the Tea Development Account schemes 1990 and 2001, formulated by Tea Board. While this clause provides a tax break, it would be more efficient to tax tea companies on par with other corporates, and allow them to determine the optimal utilization of resources at hand, rather than direct investments in financial instruments. Tamil Nadu has taken the first step in this direction, and done away with agricultural income tax. Other major tea growing states need to follow suit.

Apart from corporate taxes, other levies include central levies viz. tea cess, excise duty/AED and central sales tax .

Exhibit 6.1.3.D: Central Levies on Tea		
Tea Cess	a)	30 paisa/kg on tea produced except in Darjeeling Plantation District
	b)	12 paisa per kg on tea produced in Darjeeling Plantation District
Excise Duty		INR 1 per kg on tea imposed on 01.03.2002 has been abolished w.e.f. 01.03.2003. However, an additional excise duty of INR 1 per kg has been introduced w.e.f.
	a) b)	01.03.2003 for development purposes. 16% ad valorem on Instant Tea falling under heading 2101.20
Central Sales Tax	a)	2% on teas sold at Kolkatta/ Siliguri/ Coonoor & Coimbatore Auctions.
	b)	NIL on teas sold at Guwahati Auction
	c)	4% on ex-garden sale against Form-C
	d)	8% on teas sold to unregistered dealers.

Source: Tea Board

The various state-level levies on tea include state sales tax, purchase tax, employment & production cess. Cumulatively, the above taxes impose a significant burden on profitability of players in the industry.

Exhibit 6.1.3.E: Cost of Production (USD per Kg)*			
		North India	South India
Labour	Direct	0.41	0.53
	Welfare	0.4	0.29
	Sub-Total	0.81	0.82
Production	Fertilizers	0.05	0.06
	Pesticides	0.01	0.03
	Others	0.02	0
	Sub-Total	0.08	0.09
Manufacturing	Fuel and Power	0.16	0.12
	Packing	0.03	0.02
	Repairs/ Maintenance	0.11	0.07
	Overheads	0.31	0.29
	Manufacturing	0.61	0.5
Taxes	Excise and Cess	0.05	0.05
	Green Leaf Cess	0.03	0
	Others	0.01	0.01
	Taxes	0.09	0.06
	Total of Production	1.59	1.47
Marketing	Freight & other	0.09	0.12
	Total	1.68	1.59

Source: Tea Board, Industry
 * representative of typical plantation operations

One of the biggest hurdles being faced by branded tea companies is the emergence of local players, who sell loose, unbranded tea and hence do not pay sales tax and other state-level levies. This renders branded tea companies uncompetitive.

6.1.4 Distribution

In 1984, the Commerce Ministry promulgated the Tea Marketing Control Order (TMCO), which mandates tea producers to sell 70% of their output through the seven auction centres located at Guwahati, Siliguri, Cochin, Calcutta, Coonoor, Coimbatore and Amritsar, with Guwahati being the largest CTC tea auction centre in the world. The sales of packaged tea, value-added tea and tea meant for direct exports were exempt from the TMCO, as value added tea offers higher and stable realisations. This requirement has since been relaxed in 2002, and manufacturers can sell 100% of their tea directly.

Auction centres allow a single point of sale for different varieties of tea and thus help both, the producers (especially small growers), and the buyers. Further, the auction system offers the benefit of acting as a single point mechanism for sourcing a variety of teas. In addition, it enables small growers who cannot afford a distribution network to sell their produce at a reasonable price. However, as has been observed in other sector supply chains in overseas markets such as in horticulture and livestock, as markets mature, the trend shifts in favour of direct sales. In the case of the Indian tea industry, there are a significant proportion of medium to large producers who have the ability to sell directly to processors and would benefit from this transaction, as opposed to sale through auctions. The relaxation of the requirement for sales through auctions is a step towards creating efficient markets.

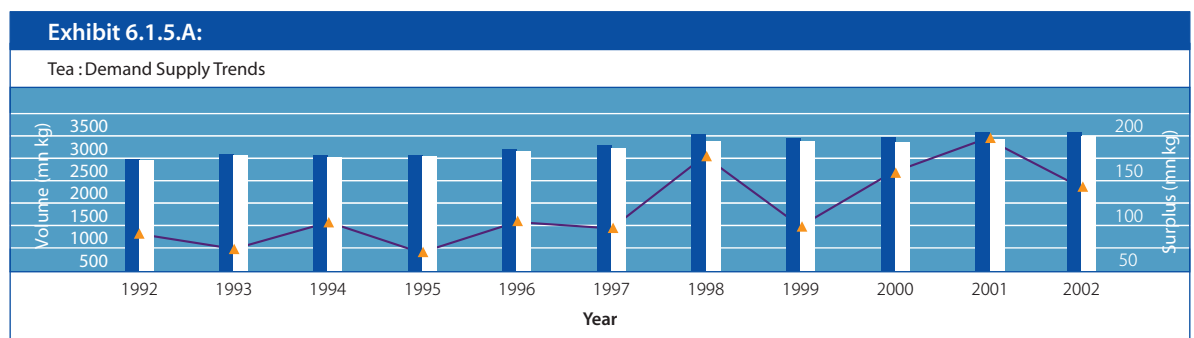
About 50% of world production continues to be traded via the auction mechanism. Auction centres are located at all major producing countries, with the exception of China. An auction centre was also located in London, which closed down in 1998.

The auction mechanism in India- Tea producers send their bulk tea to warehouses approved by the auction centre, about 7-9 weeks before the auction date. At the warehouse, tea is tasted and inspected by professional brokers. Registered buyers receive tea samples about two weeks prior to the auction. On the auction date, tea is sold by lot to the highest bidder. Payment is due two weeks after the day of sale.

6.1.5 Consumption

A. Global tea consumption

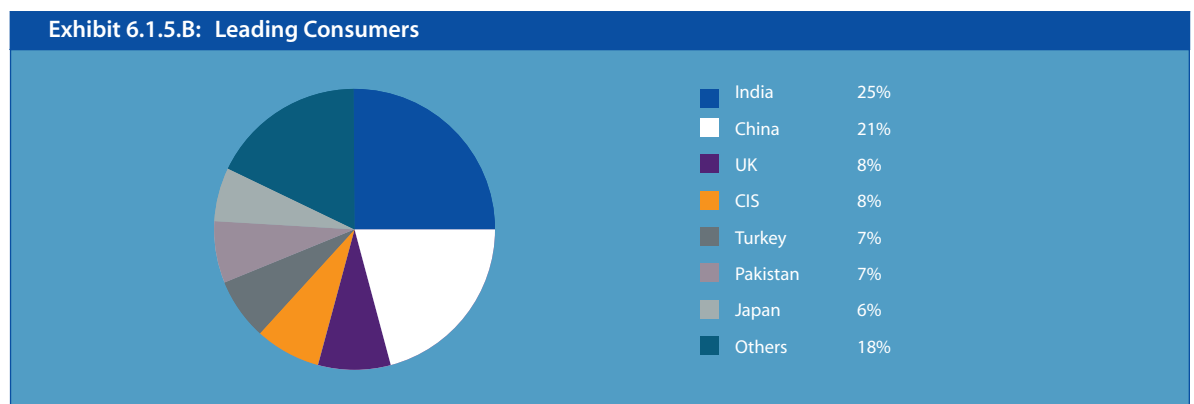
World tea consumption for 2003 is estimated to be about 2.9 million tonnes. Consumption has lagged production for over a decade, leading to surpluses and consequently downward pressure on prices. Demand growth for tea has tapered off to about 1.2% annually, primarily on account of increasing competition from other beverage categories.



Source: Tea Board

About 70% of tea consumed across the globe is black tea. Green tea is largely consumed in China, Japan and other countries in the Far East, although its popularity is rising elsewhere, mainly due to its perceived health benefits. Other varieties of tea consumed include fruit/herbal tea, oolong tea, white tea etc. Fruit/herbal tea which is not strictly tea, but infusions of other plants such as mint, chamomile etc. is a preferred drink in China, and is becoming increasingly popular in USA and in Western Europe. In most Asian countries, tea is consumed as a hot beverage, on the other hand in the USA as well as in some parts of Europe, consumers prefer iced tea.

The two leading producers- India and China are also the largest consumers of tea. Other significant consumers include the UK, CIS, Turkey, Pakistan and Japan.



Source: Rabobank, Industry

Future growth in demand for tea will essentially be led by the traditional tea consuming countries in Asia and a few non-traditional tea consuming countries such as in Europe (with the exception of The Netherlands, UK, Ireland) and the USA. However, none of the traditional Western markets (i.e. UK, Ireland, Netherlands, Australia, New Zealand) will display a strong incremental growth in tea consumption from current levels.

Exhibit 6.1.5.C: Differing consumption drivers across countries/regions

Consuming markets can be categorised on the basis of traditional and non-traditional markets. Tea consuming markets can also be categorised on the basis of income levels and growth.

i. Traditional consuming markets in Asia

In most of the consuming markets in Asia- India, China, Pakistan and the Middle East, tea is an inherent component of the daily consumables. Tea drinking is a ritual in Japan, and is an important daily consumable in others such as India, Pakistan and the Middle East. Tea is primarily consumed as a hot beverage in these countries. Growth in tea consumption is principally a function of growing population and higher income levels. Tea is consumed across all strata of society in these countries, although the variety and quantity consumed would differ.

ii. Traditional consuming markets UK and Ireland

Historically, tea has been among the leading beverages in UK and Ireland, primarily being consumed as a hot beverage. Key drivers of demand were similar to those in traditional countries- population and growth in income. However, with increasing competition from other beverages, there is a shift to other beverages such as coffee, water etc.

iii. Western Europe and USA (non -traditional markets)

In non-traditional markets, the perception of tea is very different from that in the traditional markets. Tea consumption is growing primarily on account of it being perceived as a healthful drink. Therefore, these markets will witness increased demand for healthy options such as green tea, organic tea etc.

B. Consumption of tea in India

Domestic demand has grown at over 4% over the last three decades. However, over the last decade, there has been a slowdown in growth to about 3%. India's per capita consumption of tea is about 670gms, which is higher than the global average of about 400gms, but lower than that of other major consumers such as UK (2.5 kg), Egypt (1.2 kg) and Pakistan (780 gm). In 2003, total domestic demand was about 670 mn kg. Key demand drivers include growth in population and higher disposable incomes.

There is a wide variation in the per capita consumption levels across states in India. Kerala, Gujarat, Maharashtra, Haryana, Punjab and Rajasthan have high per capita consumption rates of about 1,000 gms. While Andhra Pradesh, Karnataka and Madhya Pradesh have consumption rates close to the national average, Bihar, Orissa and Uttar Pradesh have very low consumption rates. The northern states have a larger tea drinking population, with consumption increasing in winter. In comparison, in the southern states, tea consumption is lower, due to substitution by coffee, with no significant seasonal variation in demand, due to more moderate climatic changes. Most of the tea in the northern region is consumed at home, while in the southern region, tea consumption is mainly out of home.

C. Key issue - consumption

Tea is facing significant competition from other beverages such as aerated drinks, juices and coffee for share of throat. Unlike other beverages, which are perceived to be more contemporary, particularly aerated drinks and coffee, tea is regarded as an old-fashioned drink among the younger population. There is need to revitalize consumption of tea through relevant differentiation strategies.

- one of the relevant positioning planks is that of health. As witnessed in non-traditional tea consuming markets in developed markets, health is a key driver of demand for tea. This underlies the growing demand for green and organic teas.
- Another emerging driver is lifestyle orientation. Increasingly, discerning consumers are demanding that every consumption occasion be an experiential event. This is spurring demand for unique offerings, differentiated by origin such as estate-branded tea. While foodservice outlets in India have experimented with this positioning plank, branded tea companies are yet to explore this opportunity.

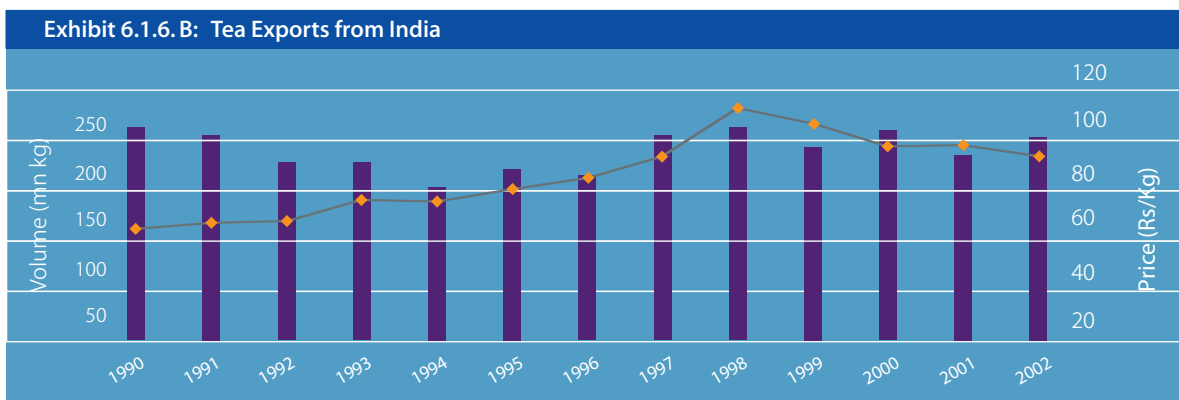
6.1.6 Exports

India is the fourth largest exporter of tea in the world after Sri Lanka, Kenya and China. About a fifth of India's production is exported. The key destination countries for exports include the Russian Federation, UAE, Iraq, UK and Kazakhstan, which cumulatively account for over 70% of exports. A significant proportion of India's exports are in bulk form, which are packed and branded in the destination countries. A large proportion of India's exports to the UK and the Netherlands are meant for re-exports to other countries.

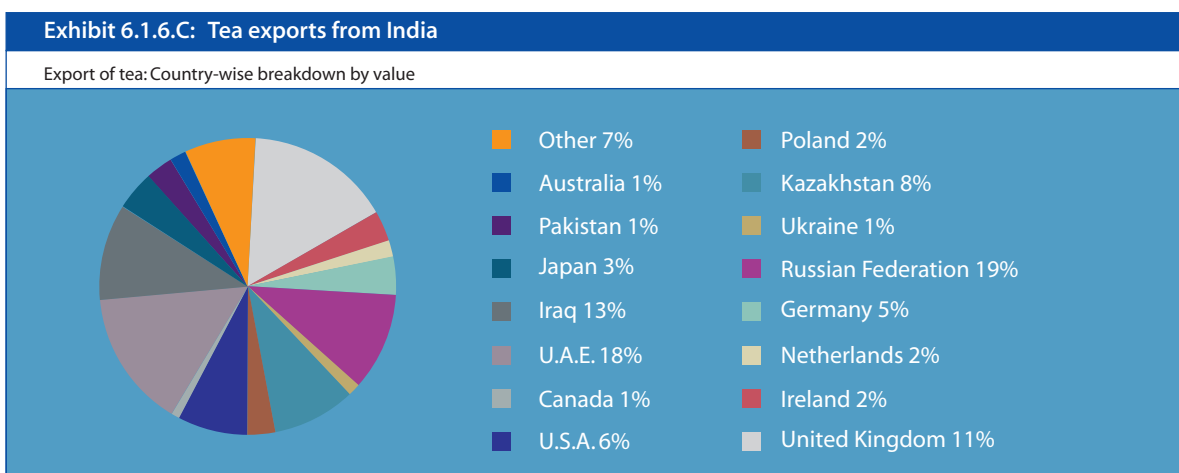
6.1.6.A: Key exporters of tea							
	EXPORTS (Million Kg)					Rank	1999-2002
	1999	2000	2001	2002	Average		
Sri Lanka	263.0	280.0	287.5	286.0	279.1	1	
Kenya	241.7	217.0	258.1	267.7	246.1	2	
China	199.6	227.7	249.7	252.3	232.3	3	
India	191.7	206.8	179.9	196.9	193.8	4	
Indonesia	97.8	105.6	99.7	100.2	100.8	5	

Source: Industry, Rabobank Estimates

India's tea exports peaked at 242.1 million kgs in 1981 and remained at about 200-220 million kgs in the 1980s. During the period 1990-94, exports declined mainly due to the break-down of the erstwhile USSR (India's main export market) as well as growing domestic demand which resulted in a shift in producer interests in favour of the domestic market. However, in recent years, while domestic demand has displayed a slowdown, there has been a decline in the level of exports, which in turn has translated into a downward pressure on domestic auction prices. Thus the level of exports is a key determinant of tea prices in the domestic market.



Source: Tea Board



Case Study Vietnam: A success in tea exports

Vietnam is blessed with the climate and soil suitable for tea growing. There are about 610 tea producers and businesses, including 170 tea exporters. The country is exporting tea to 59 countries and territories worldwide. This year, the country plans to ship abroad 75,000 tonnes of tea worth US\$75 million. The Vietnam Tea Corporation has also invested US\$200,000 in a trade promotion and trademark advertisement programme this year.

Pakistan- A high potential market for tea

Pakistan is the second largest tea-importing nation. Kenya has a 65 % market share in Pakistan, which is mostly CTC-oriented. During the last year, ITA has successfully opened trade channels with Pakistan. From less than one million kg in 2001, the exports increased by 6.8 million kg in 2003. In 2004, it is expected to touch the 10 million kg-mark.

Recently, the Pakistan Government reduced import duty on tea by 10 percentage points. In effect, the total incidence on imported tea from India into Pakistan declined from 52 % to 28 %. Industry sources said that tea is likely to go off the tariff chart by 2006, when the SAFTA (South Asian Free Trade Agreement) comes into effect

A. Exports - key issues

1. High proportion of sales in bulk form

The share of bulk tea in exports (volumes) from India has increased from 49 % in 1996 to 78 % in 2000, while the share of packaged tea recorded a decline from 51 % to 22 % in the corresponding period. This translates into low selling prices for exports. In our view, there is significant potential to enhance prices realized through focused product-market strategies, supported by targeted promotional campaigns, especially at a generic 'country' level by the Government.

2. Product mix

As mentioned earlier, strategies of tea producers, have been increasingly determined by domestic demand trends. This underlies the growing share of CTC production. However, consumers in West Asia consume orthodox tea, while green tea is witnessing increase in demand in non-traditional western countries such as in Europe and the USA. Similarly, there is growing demand for organic tea. The potential to export these high-growth products needs to be tapped effectively. Of the total tea produced in India, only about 3.5mn kg is organic, mainly sold to Germany, France, UK and Japan.

3. Reliance on few markets

Indian producers had attuned their production to suit the requirements of the erstwhile USSR, given its dominance in consumption and imports, and did not focus on alternate markets. The disintegration of the

USSR, and the political turmoil thereafter, resulted in the following:

- Uncertainty of demand from this region, which had an impact on world tea prices
- Increased price-sensitivity

As against this, countries such as Sri Lanka and Kenya have attempted to diversify their customer base to avoid over-reliance on any one country. Further, even in the CIS, low-cost producer exporters such as Sri Lanka, Indonesia and Bangladesh, which are more cost-competitive than India, have been able to make significant inroads into the market.

Demand for tea (mainly orthodox) is expected to grow steadily in West Asian countries such as Iran, Syria and Saudi Arabia. At present, India accounts for only 4% of total imports (75 mn kg annually) into these countries. Similarly, North African countries such as Egypt and Sudan are significant consumption markets for tea, cumulatively estimated at 72 mn kg. However, India accounts for under 1.5% of total imports by these countries. These markets need to be tapped effectively to obtain superior prices through export of superior quality tea.

6.1.7 Imports

- Until 1997, imports of tea were canalised and allowed only for re-exporting in select export processing zones (EPZs). The imports of tea for re-export were guided by four conditions:
 - there should be 40% value addition
 - the imported tea must be blended with Indian tea
 - the blended tea must be re-exported only in packet form
 - the blended tea cannot be sold in the domestic market
- 1998, the Commerce Ministry issued a circular permitting the tea industry to import tea for sale in the domestic tariff area. However, the circular laid down the following restrictions:
 - Sale of tea in bulk form in domestic tariff areas (DTA) would not be permitted
 - Import entitlements for the sale of tea in DTA would be available only against exports made on or after January 1998 and until June 1998

Exhibit 6.1.7.A: Trends in import of tea into India			
Year	Quantity	Value	Unit C.I.F.Price
	Million Kgs	(INR Billion)	Rs.
1997-98	2.6	0.178	68.2
1998-99	8.9	0.647	72.5
1999-2000	10.4	0.620	59.8
2000-01	15.4	0.967	63.0
2001-02	16.1	0.837	51.9
2002-03	16.6	0.908	46.3

Source: Tea Board

As depicted above, there has been a sharp increase in import of tea over the period 1997-98 to 2001-02. In the Budget for 2001-02, the import duty on tea was increased from 35% to 70%, and in the subsequent year, further to 108%. The ceiling WTO rate for tea is 150%. While imports of tea from Nepal are exempt from customs duty, in the case of Sri Lanka, an annual quota of 15 million kgs has been allowed to be imported, at a special duty rate of 7.5 % from 2000, as per the bilateral trade agreements between the two countries. While negligible as compared to India's total production, the imports do aggravate the demand supply balance and result in downward pressure on auction prices.

6.1.8 Vision, strategy and action plan

The tea industry can achieve a size of INR 136bn by 2010 and INR 211 bn by 2015. This will be on the back of

- yield improvement
- restoration of production growth
- improved product mix in export and domestic markets
 - Increase share of orthodox tea in production, from 10% to 14% by 2010 and 17% by 2015
 - Increase share of exports in branded, packed form from current 22% to 36% by 2010 and 45% by 2015
 - Increase in share of packaged segment from current levels to 60% by 2010 and 70% by 2015

The above would require cumulative investments of INR 53 bn by 2010 and further INR15 bn by 2015

Exhibit 6.1.8.A: Market Potential and Investment Required									
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)
Tea	0.857		78570	1.20%		0.947	136401	1.0435	211741
Domestic	0.673	90000	62010	1%	6%	0.744	100683.1	0.821	148663
Exports	0.183	90290	16560	0.2%	10%	0.203	35718	0.223	63078
Subtotal - Tea			78570				136401		211741

Production growth rate of tea is expected to be 1.4% per year until 2010, and 2% in the period 2010-2015, on the back of improved yields. Yields will improve from current levels to over 2000 kg/ha by 2015.

A. Remove statutory requirements for employment at plantations

The State Governments need to relax the requirements for minimum employment as well as provision of other benefits to plantation workers, in order to enable the tea plantation companies to operate more efficiently. This will allow tea plantation owners to set aside funds for periodic refurbishment, and thus ensure long term sustainability of plantations.

B. Reduction in direct tax burden

Tea companies face a higher tax burden as compared to other companies, as detailed earlier. This is despite the fact that the industry is cyclical and therefore does not enjoy a sustainably higher profitability as compared to other businesses. It is recommended that tea companies be liable to pay corporate taxes as applicable to other companies, while maintaining the income sharing formula between the Centre and States.

The above measure could play a catalyzing role in incentivising reinvestment in plantations for upgradation. This in turn can have several spin-offs including superior quality, improved realizations from exports and superior selling prices.

C. Upgradation of tea estates

One of the key challenges for the Indian industry is the ageing profile of Indian tea bushes, which if unaddressed, will aggravate the issue of declining yields. Tea players have been unable to invest in upgradation through replanting, given their stretched financial condition. It is important that the State Governments step in to support replanting activities, by funding 50% of the costs incurred.

It is estimated that at least over 50% of tea plantation area needs to be upgraded over the next five years. Of this about 170,000 ha require replanting, and about 42,000 ha require pruning. The estimated cost of this activity is about INR 235,000/ha (Source: Tea Board), which translates into a total cost of INR 49.82bn. Further, it is estimated that annually about 10,000 ha would need to be upgraded, which translates into total investments of INR 15.3bn. It is recommended that the Central Government design a special scheme to fund 50% of these costs.

D. Removal of indirect taxes

Unbranded, loose tea manufacturers are not required to pay any taxes, which impacts the profitability of branded tea companies. Tea, is a necessity, and part of daily consumption across all income classes. Therefore, it is recommended that manufactured tea be subject to nil excise. Further, tea should be exempt from various

state-level taxes such as sales tax, octroi etc.

E. Promotion of value-added teas for exports

The Government should incentivise production/manufacturing of value-added tea such as orthodox tea, green tea and organic tea. The production cost of orthodox tea is about INR 8/kg higher than that for CTC tea. It is recommended that the Government incentivise increase in production of orthodox tea by financing 50% of the costs of conversion for large tea producers. Further, collections from the AED (already available) should be utilized to enable conversion of small growers/producer to orthodox tea.

F. Promotion of cluster models for small farmers

Small growers, on account of their lack of scale suffer on various accounts including

- Lack of awareness of world demand-supply trends
- Lack of ability to invest in high yielding clones
- Lack of ability to invest in replanting/upgradation etc.

In this context, collectivization of farmers, under a producer company would be a feasible solution, wherein each farmer has a shareholding in the producer company equivalent to his contribution to total sales in value terms. Such a structure would enable effective knowledge dissemination on demand-supply trends, cultivation practices etc on the one hand, as also facilitate effective marketing and brand creation, backed by adequate volumes.

- Existing processing facilities for tea could be utilized on job-work basis for processing of tea.
- Sales of tea would be under an umbrella brand, with sub-brands for various estates, either directly to domestic marketers or for exports
- All members contribute to a common fund for marketing & promotion
- The producer company would need to be professionally managed by an individual with requisite industry expertise. who would in turn report to a Board of Directors (elected by the members)

G. Market development

1. International

India needs to reorient its export basket through

- Increased share of value added exports such as orthodox tea, green tea and organic tea
- Widen base of target markets, while focusing on those which offer superior value

The individual marketing efforts of players need to be supplemented by a generic promotion strategy of the

Government. This is already being undertaken by the Tea Board. It is recommended that in addition to the above, The Tea Board identify select estates which produce superior quality teas, and support producer efforts to promote these specific estates. Origin specific tea is increasingly in demand by discerning consumers, and can fetch superior prices. This strategy can be highly effective for small growers, who do not have forward linkages with marketers.

2. Domestic

Aligned with market development efforts for exports, it is also critical to boost domestic demand for tea, which is facing increasing competition from other beverages. Internationally, it is well recognized that tea has a beneficial impact on health, which can form an effective plank for rejuvenating demand.

The removal of indirect taxation can facilitate marketers to invest in market development, but these efforts also need to be supported by generic campaigns, highlighting the benefits of tea, under the aegis of the Ministry of Food Processing.

H. Caution with free trade agreements

As mentioned earlier, India has entered into Trade Agreements with Nepal and Sri Lanka, which have resulted in imports of tea from these countries into India. The Indian industry, which is already under significant competitive pressure on account of the industry cost structure on the one hand, and global demand-supply imbalances on the other, will be affected adversely on account of these and similar agreements which result in inflow of tea into the country. It is recommended that tea be kept out of the purview of Free Trade Agreements (FTAs), until the industry's issues of cost structure are addressed by the Government at the Central and State level.

The action plan is as follows:	
Central Government	<ul style="list-style-type: none"> Remove excise on tea Promote cultivation of orthodox tea for exports, by reimbursing 50% of the cost of required modifications in processing facilities to shift from CTC to orthodox Estate specific promotion by the Tea Board for select estates Market development efforts to boost exports of value-added tea Generic promotion campaign to boost consumption of tea in the domestic market Remove import of tea from the purview of FTAs, until industry's issues of cost structure are addressed Government Scheme to support upgradation of tea estates, by reimbursing 50% of the costs incurred
State Government	<ul style="list-style-type: none"> Modify statutory requirements for adherence to employment norms as per the Plantation Labour Act Parity in taxation with other corporates, through modification of agricultural income tax Promotion of cluster models for small growers Remove indirect taxes on tea

6.2 Coffee

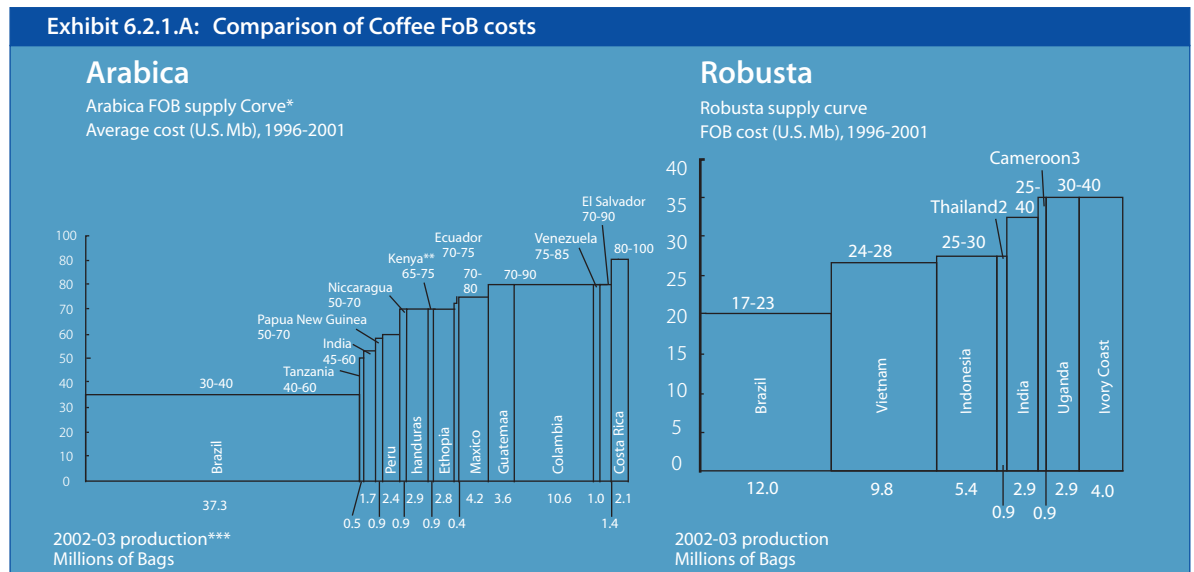
6.2.1 India in the global coffee industry

India is a small but competitive producer of coffee and has a long term sustainable position in this crop. With about 0.3 million MT of annual output India is the fifth largest coffee producer in the world accounting for 4% of total production. Over 75% of production is exported, of which more than half is exported to three countries- Russia, Germany and Italy.

Coffee is cultivated in the three southern states of Karnataka, Kerala and Tamil Nadu. The tropical climate, fertile soil and scientific methods of cultivation have enabled development of both varieties of coffee - Arabica and Robusta, the latter currently constituting about 61% of total production.

Karnataka is the largest coffee producing state, accounting for about 70% of production (54% planted to Arabica, 46% to Robusta). Robusta is dominant in Kerala (which accounts for 95% of planted area) and Arabica in Tamil Nadu (which accounts for 82% of planted area). Most coffee holdings are small, with over 70% of the area comprising smallholders with individual holdings of less than 10 hectares. Large growers with an individual holding size of more than 10 hectares, account for 40% of output.

India, although small in the global coffee context, is established as a cost competitive producer of good quality coffees. A comparison of costs of Arabica and Robusta in various countries is provided below.



Source: Industry, Rabobank Research

6.2.2. Regulatory environment and its impact on Indian coffee exports

Liberalisation of coffee exports through the 1990s has boosted export of Indian coffee, which has several superior characteristics, such as eco-friendliness, and diversity of product offerings including a wide range of specialty coffees.

Until 1992-93 coffee marketing, both domestic and export, was wholly administered and regulated by the Indian Coffee Board. The Board initiated liberalisation of the sector during 1992-93, aligned with Government policy as well as in response to requirements of growers. An Internal Sale Quota (ISQ) was introduced, which allowed growers to sell 30% of their output directly to the domestic market. The ISQ was replaced by a Free Sale Quota (FSQ) in 1993-94, which allowed growers to sell 50% to the domestic or overseas market. This was subsequently increased to 100% for all growers by 1995-1996.

The fact that coffee trade was controlled until 1995-96 translated into limited efforts to promote Indian coffee as distinctive and superior in the global market, even though 35% of the Indian produce was of high-grade Arabica. A large proportion of Indian coffee is used for preparing coffee blends, although there are several varieties that qualify to be sold in their pure form.

With the downturn in international coffee prices that began in 1997, Indian exporters and the Indian Coffee Board started intensifying efforts to position India as a high quality producer of coffee. Exporters are increasingly promoting Indian specialty coffees in the world market, with the aim of obtaining superior value for their products. There is greater focus on quality enhancement through improvement in processes adopted for harvesting, handling and drying of coffee.

Participation in International exhibitions and events related to coffee has translated into greater awareness about Indian coffee and its attributes. In fact, Indian specialty coffee has been receiving a tremendous response at such exhibitions in the recent past.

Indian coffee has several positive attributes that can be used for effective positioning strategies in the global market.

- **Eco-friendliness**

A large proportion of coffee in India is shade-grown. This is one of the features that can command a premium in international markets due to its superior taste, and due to the fact that these plantations are eco-friendly and provide the perfect habitat for birds.

Since the use of agro-chemicals for coffee is minimal in India, a large proportion of Indian coffee is near-organic by default. Given the increasing demand for organic food globally, India is well-positioned to benefit from this, by tailoring cultivation practices to address these demand opportunities. Some coffee

plantations have already commenced the process of obtaining organic certification.

- **A wide range of specialty coffees**

India produces a wide variety of specialty coffees, which enjoy an average premium of 20% to 50% over regular coffee prices. Export of specialty coffees has been growing at a CAGR of about 20% over the last 8 years. India exported 7800 MT (valued at INR 450 mn) of specialty coffee in 2003.

Monsooned coffee -

Monsooning of coffee is the acquisition of a mellow yet unique taste, from the swelling of coffee beans due to the moisture in the air during the monsoon season. It is prepared by a special process and is particularly appreciated by consumers in Scandinavian countries for its special colour and flavour. The main monsooned coffee grades are Monsooned Malabar AA, Monsooned Basanally and Monsooned Robusta AA

Mysore Nuggets Extra Bold -

This coffee is a premium Arabica washed coffee that represents the best quality coffee from India. The beans are very large, uniform bluish green in colour with a clean polished appearance. In the cup, the coffee exhibits full aroma, medium to good body, good acidity and fine flavour with a hint of spice.

Robusta Kaapi Royale -

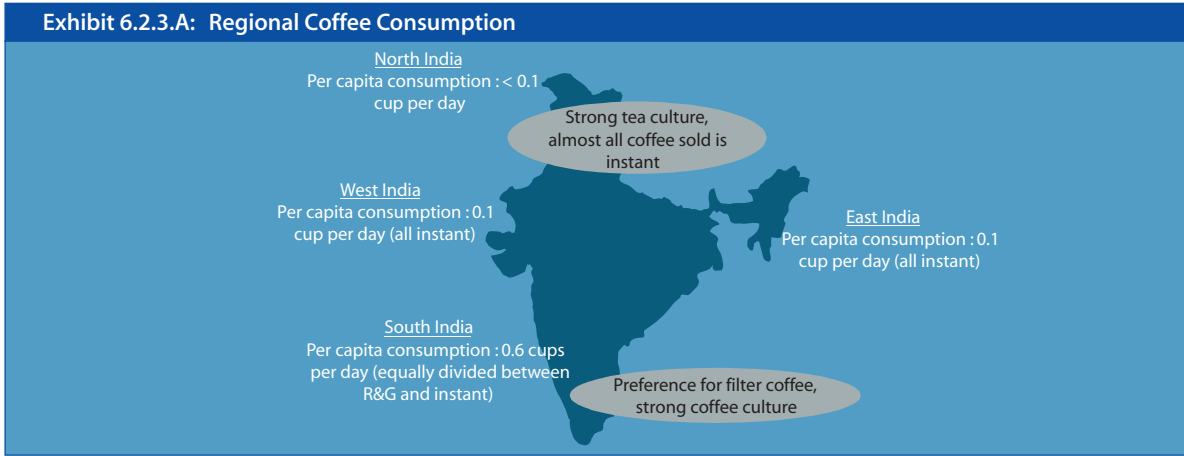
This coffee is prepared from Robusta Parchment AB from the regions of Mysore, Coorg, Wynad, Shevaroyas, Pulneys and Barbabudans. The beans are bold, round with pointed ends and are grey to bluish grey in colour. This cup ensures a full body, soft, smooth and mellow flavour.

Indian exports of value added coffee, such as instant coffee, have also been increasing rapidly over the last few years. As per the latest available figures from the Coffee Board, India exported INR 3.75 bn of instant coffee in 2001-02. However export of roasted / ground coffee is yet negligible.

6.2.3. Domestic coffee market

Domestic coffee consumption is concentrated in South India, with consumption of chicory mixed R&G coffee driving sales volumes.

Traditionally a tea-drinking country, average coffee consumption in India is low at 10 cups per person annually. Coffee consumption has been largely concentrated in the three southern states - Tamil Nadu, Karnataka and Andhra Pradesh. The regional differences between coffee consumption are depicted in exhibit 6.2.3A.



Source: Coffee Board

Indian coffee consumption is estimated at about 70,290 MT of pure beans. The segment has witnessed tremendous growth as consumption was approximately 55,000 MT just 3 years ago.

- Of this, 51% is instant and the remaining is R&G
- The urban/rural share of consumption is 70%/30%
- In rural areas, R&G accounts for 53% of consumption

The instant coffee segment is almost entirely branded and packaged and is dominated by few large players. One of the key reasons for this is the high capital investments required to set up instant coffee manufacturing units. On the other hand, the R&G segment is dominated by numerous small, local brands. The branded category consists of packaged coffee players and fresh R&G coffee players with their chains of exclusive outlets.

Exhibit 6.2.3.B: Key players in the Indian coffee industry

Key players	Cafés	Exclusive retail outlets for R&G coffee	Vending - Fresh coffee	Vending - Instant coffee	Branded
ABCTC	3 Pan- India	3 Across all South Indian cities	x	x	x
Barista	3 Pan-India	x	x	x	x
Fresh & Honest	x	x	3	x	x
HLL	x	x	x		3R&G and instant
Leo	x	3 Chennai (Tamil Nadu)	x	x	x
Narasu	x	3 across Tamil Nadu	x	x	x
Nestlé	3 across key metros	x	x		3Instant
Qwiky's	3 across Delhi, key cities in South India	x	x	x	x
Tata Coffee	Through Barista	x	x	3	3Instant and R&G

Strong growth is being witnessed in the domestic coffee segment (both in the instant as well as the R&G segment); this is the result of a combination of demand side as well as supply side factors. On the supply side, there is an emergence of a new breed of coffee players focused on promotion of coffee through

- Fresh R&G coffee (as against packaged R&G coffee)
- New flavours and blends
- New distribution channels for selling and promoting coffee consumption

6.2.4. Global trends in coffee distribution channels

Globally, the largest growth in coffee markets is driven by liquid coffee retailing through coffee bar chains and vending machines. The trend towards liquid coffee is in keeping with the overall shift towards convenience and experiential branding of coffee drinking. For example, the sale of coffee through vending machines has been growing at double-digit rates in most traditional coffee drinking regions, such as the USA and Western Europe, over the last few years.

Consumption growth in emerging coffee markets, such as Japan and China, is also being led by the increased availability of coffee through new distribution channels such as coffee bars and vending machines as well as development of new products and packaging forms aimed at quality, convenience and experience enhancement. Although Japan and China are traditionally tea-drinking countries, coffee has now established itself as an everyday beverage, supported by the above-mentioned trends in distribution and consumption. The importance of liquid coffee retailing is highlighted in the growth experienced in this segment. In the US, for example, specialty coffee outlets increased from 500 units in 1991 to more than 12,000 units in the year 2000. These numbers include 3,500 coffee cafés, 2,700 coffee bars & kiosks and 2,100 espresso carts. Starbucks, a leading coffee chain, has been experiencing compounded annual growth rate of over 30% in the last 2 years.

Other coffee growing regions are capitalizing on this trend by establishing their own brands of cafes in the major consuming regions. Juan Valdez, the icon of Colombian coffee, has opened Juan Valdez coffee shops across the world. Colombia's National Federation of Growers plan to spend USD 2.2 million on setting up cafes modeled on Starbucks. It has already established presence in Miami, and in the Colombian cities of Bogota and Medellin, and plans to expand to other U.S. cities, Germany, England and Japan. Coffee producing countries are attempting to have a direct presence in the consuming markets in order to have better control over the value chain. The coffee consuming markets control a large proportion of the price paid by the consumer, while the coffee farmer gets merely 5% of the final price.

Exhibit 6.2.4.A: Coffee price build-up*		
	Euro	%
Consumer price	1.62	100%
VAT @ 6%	0.09	6%
Ocean freight, warehousing, roasting, packaging, financing plus importer & roaster margins	1.25	77%
FOB price	0.28	17%
Export taxes (if applicable) & other fees	0.01	1%
Local transport, processing, financing plus trader margin	0.19	12%
Farmer price	0.08	5%

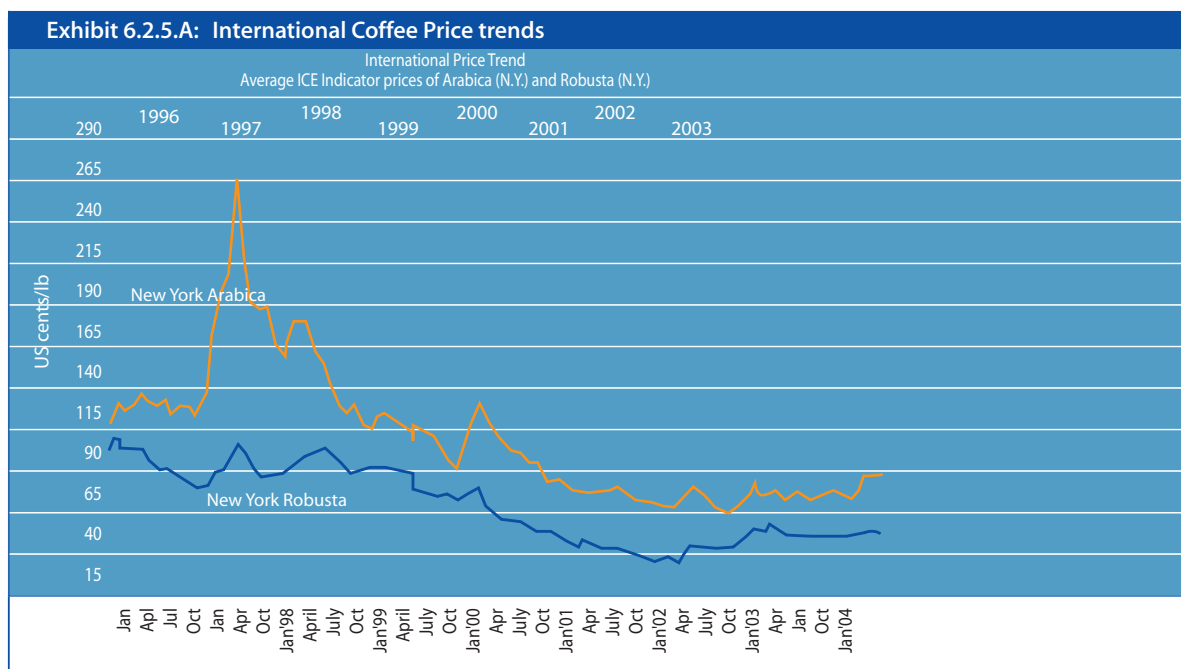
This control of the roaster / processor and marketer on the value chain has prompted several coffee producers to foray downstream into branded, packaged offerings. For instance, Mario Cerna, a producer from North Nicaragua, has invested USD 1 million in a roasting plant to capitalise on the rise in consumption of instant coffees. Cerna aims to become Nicaragua's second largest exporter of instant coffee after the company "Cafe Soluble" which exports around USD 9 million of instant coffee annually. Cerna aims to market its brand in the United States, Central America and Europe.

6.2.5. Issues in the indian coffee industry

A. Production

1. Low prices and farmer debts

International coffee prices, which also determine domestic prices, have been on a steady decline over the last 4 years.



Source: ICO

While contending with unattractive international prices, coffee growers in India have witnessed additional challenges on account of drought across the key coffee-growing regions of the country. This has increased the white stem borer attacks in Arabica plantations leading to increased need to replant several areas. These problems have affected the coffee farmers adversely impacting their:

- Debt servicing capability
- Financial ability to undertake replanting (or any other measures to effect improvements on the plantation) to improve yields

The Central Government and the Coffee Board initiated a Special Coffee Term Loan (SCTL) scheme in 2002 to provide short term repayment relief to the coffee farmers. The key features of this scheme were:

- Consolidation of all coffee loans (which were not NPAs) together with all outstanding interest capitalized
- Repayment period of 9-11 years and repayment holiday of 3 years.
- Growers who had availed crop loans in 2001-02 were required to repay a minimum 75 % of crop loans to be eligible for availing fresh crop loans in 2002-03 and the balance 25 % was included for rescheduling the special coffee term loans package.
- Reduction of interest rate on SCTL by 1%

The Government of India is also providing 5% interest relief to small growers on the working capital loans taken by them from financial institutions.

The industry has been demanding a complete waiver of the interest dues, especially for the small farmer (less than 10 ha) who is unable to bear the burden. However, such waivers cannot become a norm for the financial sector, and therefore this may not be an ideal solution.

The coffee sector needs to be supported through a mix of short term and long term measures, such that it is better positioned to handle the high volatility in global coffee prices in future.

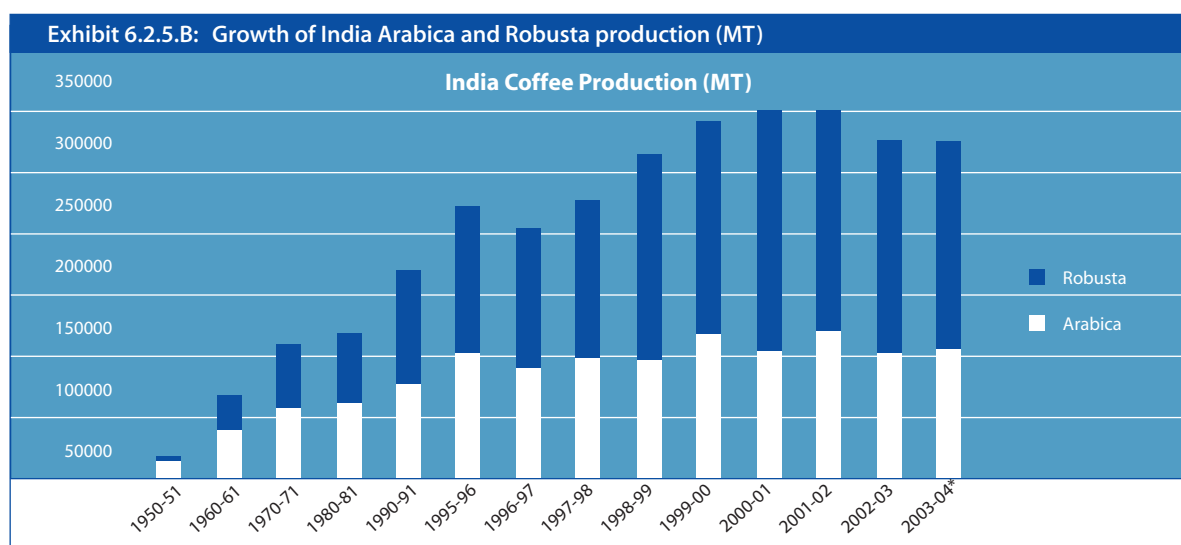
Solution Themes

(A) Improving farm productivity and diversification

India has intrinsic strengths in coffee, with competitive costs, high productivity levels and good quality Arabica and Robusta coffees.

Except in the recent past, coffee has been a profitable crop for Indian farmers and the area under coffee has been increasing, over the last few decades. However one trend is disturbing in the Indian coffee arena. This is the rise in Robusta cultivation, as against Arabica, where India has traditional strengths and cost advantages.

In fact, Arabica constituted over 80% of the total production in 1950s, and has declined to less than 40% of production in 2003-04.



Source: Coffee Board

The reasons for the growth of Robusta, at the cost of Arabica are as follows:

- Higher cost of cultivation of Arabica (approximately double the cost per hectare as compared to Robusta)
- Higher labour involvement in Arabica (aspects concerning labour cost are discussed in following sections)
- Lower yields in Arabica
- High incidence of stem borer attacks in Arabica which have led to quicker decline of such estates (Arabica tree has a life span of 30-40 years against 60-70 years in the case of Robusta)

The Arabica plantations, which are older than Robusta (typically newer estates) have also been attacked by the stem borer and need urgent attention through replanting measures. The Coffee Board has already commenced a subsidy of INR 20,000 per Ha for replanting of Arabica plantations. This subsidy is currently provided to small growers (< 10 Ha). Moreover, the Karnataka Government has offered low cost loans from cooperative banks for the agricultural sector. This will benefit large estates (who are not eligible for the subsidy) who wish to replant their estates through cheap loans.

The above measures should be coupled with efforts to increase inter-cropping in coffee estates. Currently, the world is facing an oversupply of coffee which has led to low prices. In this scenario, if some farmers wish to reduce their dependence on coffee, it should be encouraged by the Government.

Planters have identified a few alternate crops such as vanilla, cocoa, cinnamon, cashew, pepper for cultivation based on climatic pattern and elevation of the different plantation areas. Such diversification would ensure continued employment of the existing labour force without affecting the ecological balance.

The state land ceiling acts do not permit reduction in acreage under coffee. This has discouraged many farms from undertaking inter-cropping or cultivating other crops in marginal areas of the plantations. This law needs to be amended to permit the estates to engage in cultivation of alternate crops which would in turn lead to:

- Better yields
- Improved labour utilisation
- Improved utilisation of marginal land

In Karnataka, Rule 9 of the Karnataka Land Grant Rules, 1969 needs to be amended to permit greater inter-cropping. This rule requires permission from the State Land Grant authority for making any change in the land grown under coffee.

Similarly, in Tamil Nadu, section 73 of the Tamil Nadu Land Reforms (Fixation of Ceiling on Land) Act, 1961 needs amendment to permit diversification beyond defined plantation crops such as tea, coffee, rubber, cardamom and cinnamon. Planters have identified crops such as vanilla, cocoa, cashew, pepper, certain herbs and medicinal plant varieties, aromatic plants, floriculture etc., depending on the elevation and location.

In a recent move, the Government of Kerala introduced a Bill in the State Assembly amending the Land Reforms Act to include cashew and a few other crops in the exempted list.

(B) Price risk management

The Coffee Board has proposed a scheme, along with three other participating banks, for introducing put options (bought from international coffee exchanges) to the Indian farmers. The details of the scheme are presented in exhibit 6.2.5.C.

Exhibit 6.2.5.C: Coffee Board's Put options scheme for coffee price management

Objective	Provide farmers with a safety net in the form of price protection on the global coffee market. Protect banks against farmer financing defaults caused by decline in coffee prices.																												
Instrument	Exchange traded coffee options. These contracts pay the grower the difference between a price level protected, "strike" and the market price on the option expiry day, in return for an up-front premium.																												
Maturities	Three to Six month from the date of purchase of the options.																												
Underlying	New York C futures contracts for Arabica LIFFE coffee contracts for Robusta																												
Cost as a % of Underlying	<table border="1"> <thead> <tr> <th>Periods</th> <th>Out of the Money</th> <th>At the Money</th> <th>In the Money</th> </tr> </thead> <tbody> <tr> <td>Arabica</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 month</td> <td>3-6%</td> <td>6-8%</td> <td>8-10%</td> </tr> <tr> <td>6 month</td> <td>3-6%</td> <td>6-8%</td> <td>8-10%</td> </tr> <tr> <td>Robusta</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 month</td> <td>3-6%</td> <td>6-8%</td> <td>8-10%</td> </tr> <tr> <td>6 month</td> <td>3-6%</td> <td>6-8%</td> <td>8-10%</td> </tr> </tbody> </table> <p><i>(Source for quotes: NYBOT, tradesignals.com (based on LIFFE)).</i></p> <ul style="list-style-type: none"> • The grower will be paid in Rupees and therefore bears the risk of adverse movements in the exchange rate. He will receive the Rupee equivalent of the \$US insurance payout at the prevailing exchange rate on the day of settlement. • As London and New York coffee prices change daily, growers will provide authorization to the Coffee Board to transact at the price levels indicated on the offer sheet, and Coffee Board in turn will place a standing order with the provider who has instructions to transact on a best effort basis at the price level indicated. • Growers will need to understand and agree that if the market moves from the indicated price levels and the standing order is not achieved, payments will be refunded. • Providers will settle options automatically on option expiry. 	Periods	Out of the Money	At the Money	In the Money	Arabica				3 month	3-6%	6-8%	8-10%	6 month	3-6%	6-8%	8-10%	Robusta				3 month	3-6%	6-8%	8-10%	6 month	3-6%	6-8%	8-10%
Periods	Out of the Money	At the Money	In the Money																										
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Robusta																													
3 month	3-6%	6-8%	8-10%																										
6 month	3-6%	6-8%	8-10%																										
Distribution, Participating Banks	Participating banks act as agents in the collection of orders and funds from growers. At this time the following banks will be active: Canara Bank (credit exposure to coffee sector: INR 1bn) Syndicate Bank (INR 700 mn) Karnataka Bank (INR 1bn)																												
Project Sponsor	Coffee Board. Technical support by CRMG World Bank.																												

While the scheme addresses risk mitigation requirements of the farmer, it is facing hurdles due to the high premia involved, and due to the novelty of the scheme. While the Coffee Board is making various attempts to educate the farmers about the benefits of the scheme, subsidisation of premia by the Central Government, would help in making the scheme a success. This is detailed below in exhibit 6.2.5.D.

Exhibit 6.2.5.D: Subsidy required for enabling Put Options in Coffee		
Coffee which is eligible for subsidy (MT)	180,000	Subsidy only for <10 ha growers, who produce 60% of Indian coffee
Coffee for which put options need to be bought (MT)	45,000	25% of farmers opt for this scheme
Cost of put options (USD)	2,250,000	Cost per MT is assumed at USD 50
Subsidy from Government (USD)	562,500	25% of the premium cost is subsidised by Government
Subsidy from Government (INR million)	26	

The Government can consider providing this subsidy for an initial period of 2 years, and then review it based on the feedback from growers.

(C) Taxation

Coffee farmers are subject to:

- Normal rates of Central Income tax (CIT) under Rule 7B of IT Act
- State agricultural income tax (AIT), which are higher than CIT rates

The applicability of the taxes is as follows:

Exhibit 6.2.5.E: Income Tax applicable to coffee growers		
	AIT	CIT (through Rule 7B*)
Small grower, no curing	Applicable on 100% of income;	currently exempt\$ tNot applicable
Small grower, cured coffee	Applicable on 75% of income, currently exempt ⁵	Applicable on 25% of income
Large grower with curing	Applicable on 75% of income	Applicable on 25% of income

*Rule 7 B of the Income Tax Act specifies that income derived from the sale of coffee grown and cured by the seller in India shall be computed as if it were income derived from business and 25% of such income shall be deemed to be income liable to tax \$ upto 50 acres (in Karnataka)

⁵ upto 50 acres (in Karnataka)

Since CIT is applicable only when coffee is sold in cured form, it is discouraging growers from value addition

and leading to farm gate sales. This rule and its applicability to small growers in particular, has caused immense harm to the coffee processing industry and the quality of Indian coffee (as coffee retains better quality if cured immediately).

In order to ensure that the tax regime encourages better quality of coffee, the following measures need to be undertaken:

- Parity between AIT and CIT rates, and modes of computation.
- Allow higher allowance for profits to be re-invested into replanting of coffee estates. Currently, the replanting allowance is INR 900/MT (as fixed in 1994) this too is allowed to be utilized as per notified expenses (which are too few in number). This allowance needs to be changed to a land-based calculation of depreciation. This is because the replanting investment is per acre of land, rather than per MT of output. Further the replanting 'depreciation' could be at different rates for Robusta and Arabica considering that their average life spans are different. This measure will incentivise coffee farmers to invest in their plantations to improve yield and quality levels.

(D) Amend labour laws

The labour laws for the plantation sector stipulate that any person who is employed for more than 90 days, needs to be treated as a permanent employee of the estate with all provisions relating to gratuity, housing, education, canteen facilities etc.

These laws impose an additional burden on the estate where labour is required seasonally. Further, there is a growing preference for cultivation of Robusta which is less labour intensive as compared to Arabica.

2. Processing

Although washed coffees are of better quality and fetch superior prices, all farmers do not adopt this process. Ideally coffee should be washed at the farm before being brought to the curing works. However some of these best practices are being restrained by regulations on the coffee sector.

(A) Remove purchase tax in Karnataka

The purchase tax of 4% in Karnataka is not applicable if coffee is sold by a producer to an exporter. However if there is an intermediary involved, or if the sale is in the domestic market, this tax is applicable.

Typically, coffee is sold by the farmer to a curer / trader who stocks it until the exporter obtains an export order for the same. The exporter then purchases the coffee from the trader. The 4% tax stipulation has affected the curing industry severely, as several non-registered curing works who bypass the payment of

purchase tax, have emerged.

It is estimated that there are over 80-100 such unregistered works in Karnataka, and the tax evasion is high. At the same time, capacity utilisation of registered curing works has dropped to 35-40%, as their existing business has moved to unregistered hullers. The expenditure of the Karnataka Government on collection of this tax is estimated to be higher than the revenue collections on account of coffee purchase tax. This tax should be scrapped.

(B) Address Food laws for coffee

The Prevention of Food Adulteration Act (PFA) does not permit use of flavours in packaged coffee as any additive to coffee is treated as an adulterant. This has restricted innovation in coffee based products.

3. Exports

Coffee exports are subject to a cess of INR 500 per MT. This cess was fixed when Indian coffee would fetch over INR 70,000 per MT in the export market. However in the current scenario of low prices, INR 500 constitutes over 1% of the export realisations. The export cess is pooled into the Consolidated Fund of India and is not directed towards benefiting the coffee sector. These funds need to be utilised for estate upgradation and the quantum of cess needs to be changed in tandem with coffee prices, so that exporters and growers do not face an additional burden on profitability.

In recent times, the Government has provided a transport subsidy of INR 0.5 / kg, equivalent to the export cess, to the exporters. This subsidy takes into account the disadvantage that Indian exporters face as compared to their counterparts in other countries on account of poor transport and port infrastructure. However this is an ad-hoc subsidy and does not allow the exporters to budget their costs and revenues in a timely fashion.

6.2.6. Vision, strategy and action plan

Indian coffee has tremendous potential to further establish itself as a producer of specialty and high value coffees. The specialty coffee segment is expected to grow at 25% , which will be targeted at overseas markets. The instant coffee segment is expected to grow at over 10%. Thus the value-added segment in coffee is expected to grow 3.5x by 2015.

Exhibit 6.2.6.A: Market potential for the coffee sector

	Current Volume (Million Tonnes)	Average Price (INR/Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)
Coffee	0.40	58413	23365		5%	0.40	32877	0.40	41961

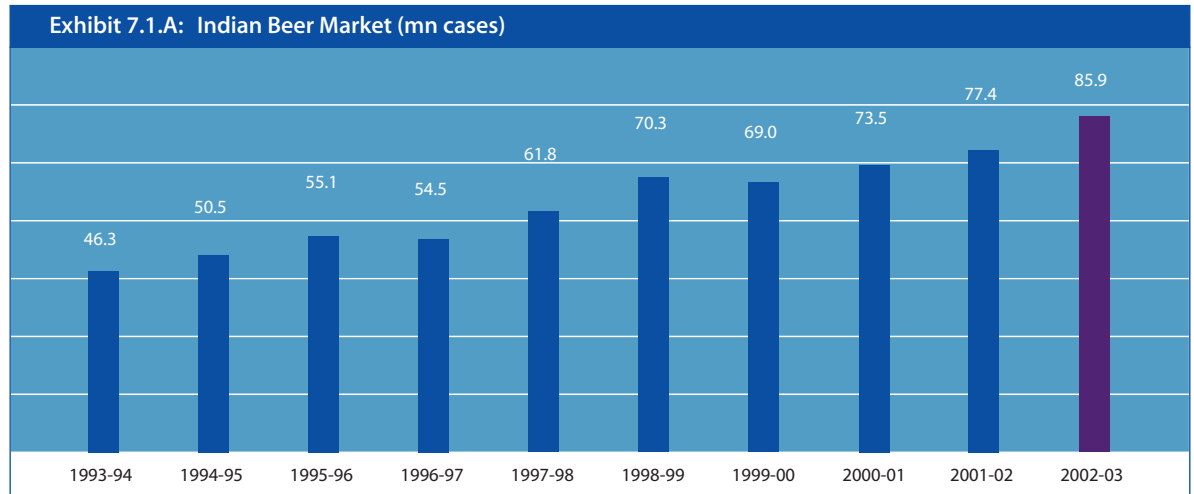
The action plan is summarised as below:

Central Government	<ul style="list-style-type: none"> • Provide a subsidy on option premium for an initial period of 2 years to allow this instrument to take off as a price risk management tool in India. • Depreciation allowance should be provided to coffee plantations • Amend the Plantation Labour Act to allow temporary labour to work on plantations beyond 90 days without being treated as a permanent employee of the estate • Amend the Prevention of Food Adulteration Act (PFA) to permit use of flavours in coffee as additives • Regularise the transport subsidy on coffee exports • Modify cess on exports, such that it changes in line with coffee prices
State Government	<ul style="list-style-type: none"> • State land ceiling / land grant rules in Karnataka, Tamilnadu and Kerala need to be amended to permit the estates to increase area under crops other than coffee • Bring parity between AIT and CIT rates, and modes of computation. • Depreciation allowance should be provided on coffee plantations • Scrap the purchase tax on coffee in Karnataka

Beer and wine

7.1 Beer

The Indian beer market was estimated at 85.9 mn cases in 2002-03. Beer consumption has been growing rapidly at a CAGR of 7% in the last 9 years, while the growth in 2002-03 was 11%.



Source: Industry estimates

This compares favourably with the global beer consumption growth rate of about 2.6% in 2001-02.

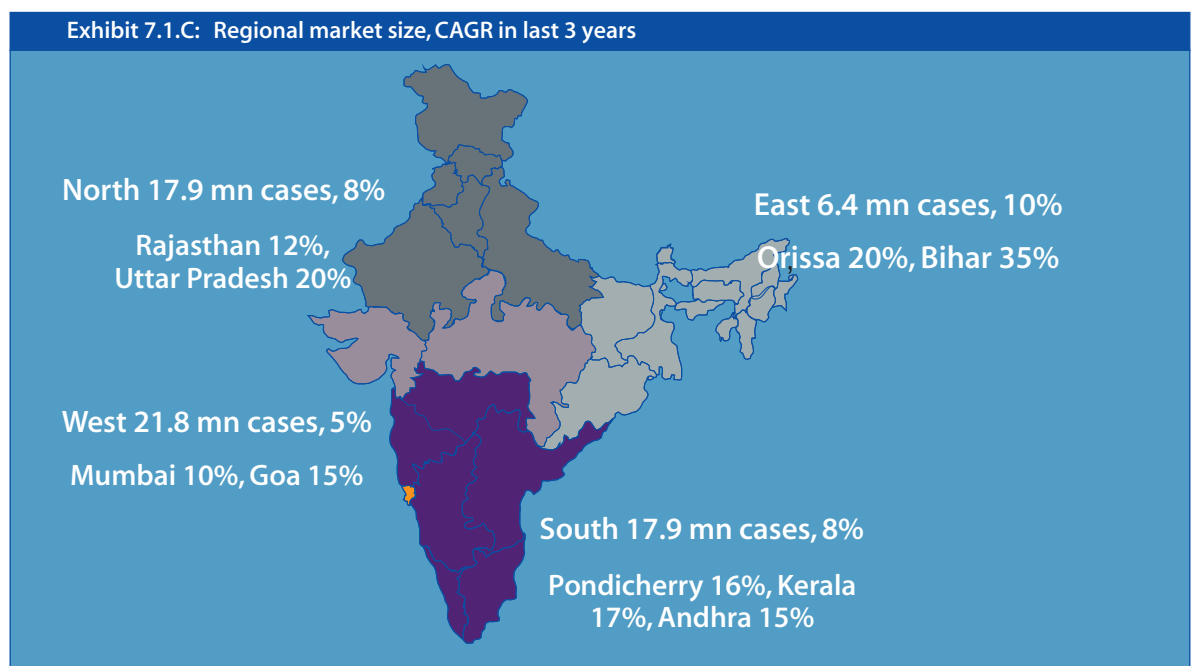
Exhibit 7.1.B: Global beer consumption

Country	Growth 2001-02	Per capita consumption (litres per annum)
USA	-0.2%	83.1
China	5.6%	15.8
Germany	-1.6%	123.1
Brazil	5.7%	46.7
UK	2.1%	97.1
Japan	-1.9%	40
Mexico	-0.7%	48.6
Russian federation	5.2%	30
Poland	1.5%	60.5
France	-0.5%	35.9
Czech Republic	-1.3%	158.1
India	6.5%	0.62

Source: Beverage Marketing Corporation, Rabo India

India, apart from recording strong growth, also provides attractive profit margins due to the consolidated structure of the industry. For example, the Chinese beer market is marked by intense competition, with several players being marginalised. The industry has about 400 brewers, of which the top 10 account for only 45% of the market. This has resulted in low profit margins for Chinese beer companies. In contrast, the top 2 beer players in India account for about 75% of beer sales in India and the industry will undergo further consolidation in the near future. The effect of this consolidation can be seen in the fact that beer prices in India are rarely ever under pressure due to competitive activity in the form of new product / brand launches. In the past, whenever beer prices have been decreased, it has been either due to lowering of duties by the Government or deregulation of distribution (leading to lower margins for the distribution channel partners), and have not affected the margins or realisations of beer manufacturers.

While the average industry growth is about 7%, several states have recorded faster growth rates. The four South Indian states account for about 45% of Indian beer consumption, and are clocking a robust growth of about 8% per annum.



Source: Rabo India analysis

A. Key beer players

The Indian beer industry, which was already reasonably consolidated, has witnessed further M&A activity in the last three to four years. As a result, 75% of the market is currently controlled by just two beer players. The

global picture provides a sharp contrast to this with the top four brewers controlling only about 30% of the market.

UB has been the leading beer player in India and has consolidated its position through the acquisition of Inertia Breweries (Haryana and Maharashtra), Associated Breweries (Mumbai), Mangalore Breweries (Karnataka), GMR Breweries (Andhra Pradesh) and Empee Breweries (Tamilnadu and Kerala). Traditionally, the UB group has had a more dominant presence in mild beer; however its new launches in the strong beer category have also done very well.

SABMiller Shaw Wallace (SABMiller-SW)- In April 2003, SABMiller acquired a 50% stake in SW.. SW is the second largest beer company in India, while being a leader in the strong beer segment.

B. Key demand drivers for growth in consumption of beer

- Perception: Changing perception of alcohol from taboo to socially acceptable
- New segments: Wide range of products are available
- Regulation: Changes in taxation structure and opening of distribution channels are further driving growth

7.1.1. Key Issues

A. Raw materia

Beer is made from malt. Availability of good quality malt has been a constraint for beer manufacturers and several players have now commenced direct purchase arrangements with farmers growing barley of requisite quality.

B. Duties and tax structures

The duty structure on beer is complex and varies across states. For players at the national level, the industry is analogous to dealing with distinct countries. The tariffs can be broadly classified into two groups:

- Tariffs owed on production and sale of liquor - excise duty and sales tax
- Tariffs owed on interstate transportation: Import taxes, charged by the destination state and export tax (levies) charged by the producing state.

In addition to the complex structure, the rate of taxation is also high. The following Exhibit provides details on the ratio of tax incidence to MRP.

Exhibit 7.1.1.A: Duties as percentage of consumer price

State	Duties as a % of end consumer price in beer
Maharashtra	43%
Tamilnadu	29%
Andhra Pradesh	33%
Karnataka	36%
Rajasthan	20%
Delhi	50%
MP	18%
Kerala	25%
UP	40%
Goa	24%

Source: Industry, 2002

C. Forced spread of manufacturing units

The structure of duties and levies has imparted different market characteristics to each region forcing manufacturers to spread their manufacturing base, albeit sub-optimally across the country. In beer, the total manufacturing capacity is over 141 mn cases, while the production is just 83 mn cases, leading to significant under-utilisation of capacity. From a manufacturer's perspective, a uniform excise policy would allow producers to implement distribution strategies appropriate to regional variations in tastes and preferences, undistorted by barriers imposed by differences in policies across states.

D. Restrictions in distribution

There are three models of distribution of beer (also applicable to wine and spirits), which prevail in different states across the country: open, auction and Government. The key characteristics of each of these models are described below:

1) Open Market

- The State Government decides on the number of wholesalers and retailers. Licenses are granted for a pre-defined price and time period
 - Liquor companies can appoint their distributors, who in turn can appoint retailers.
 - Pricing is market-determined
 - Excise is payable when the goods leave the manufacturing unit / excise bonded warehouse at branches.
- This is the most preferred form of market as it permits maximum choice for the consumer and facilitates operation of free market forces

2) Auction Market

- Private distributors participate in an auction wherein the reserve price is set by the State government
- Distributors in turn establish their own retail network and are responsible for sourcing products directly from liquor companies
- Pricing is determined by syndicates

This model is often associated with a high degree of cartelization. Further, there can be significant changes in distributors and consequently retailers every year which can translate into bottlenecks in recoveries for manufacturers.

3) Government Controlled

- State Government, through its agencies, controls the wholesale segment. In certain states, the retail segment is also controlled by the Government.
- State agencies purchase directly from liquor companies based on a predetermined secondary sales formula
- Excise is paid either by the manufacturer or the State agency on movement of goods from the warehouse (manufacturer's warehouse / state agency's warehouse)
- The consumer price is determined and fixed by the state

This model translates into restricted entry of new brands (Tamil Nadu, for instance, did not allow sale of brands which were not registered with the state before a particular date) and restricts consumer choice. Further, manufacturers do not have any control on consumer prices. Additionally, agencies which perform the function of regulators are also distributors- a contradiction, which often results in non-market forces being the determinant of prices and policies.

Exhibit 7.1.1.B: Distribution models in different states		
	Market Models	
Free Markets	Auction Markets	Government
U.P.	Punjab	Tamil Nadu
Maharashtra	Rajasthan	Andhra Pradesh
Goa	Bihar	Kerala
J & K	H.P.	Delhi / Chandigarh
Madhya Pradesh	Haryana	Karnataka /Orissa
Assam		C S D
West Bengal		

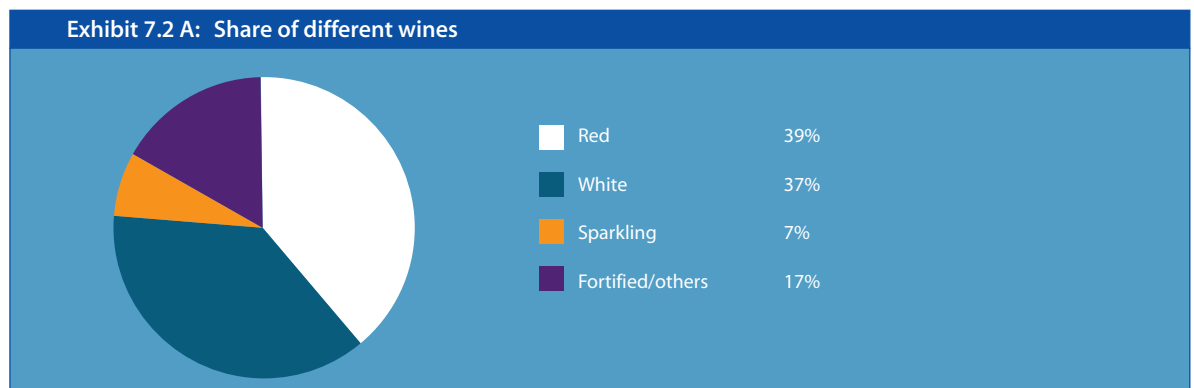
Source: Rabobank Research

Case Study - Madhya Pradesh

Madhya Pradesh has recently done away with the contract auction system and allotted liquor shops on license fee. These changes are expected to boost State Government revenue by over 12% to INR 9.7bn by next year. In the case of more than one application, the allotment would be by lottery. Further, in a bid to check illegal transportation of liquor, holograms would be embossed on each bottle, so that liquor from another district could be identified.

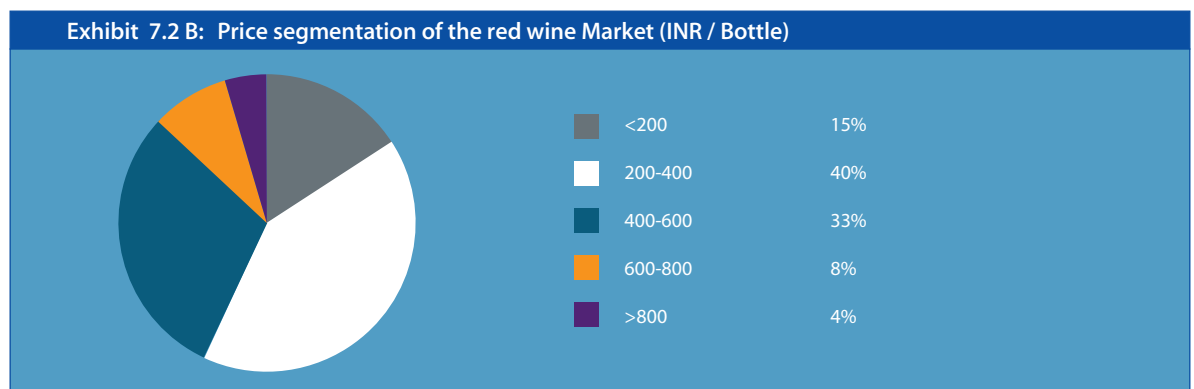
7.2 Wine

The wine market in India is nascent, having emerged as a distinct segment only about a decade ago. The total wine market is estimated at INR 2.6bn. As against this, the world wine business is estimated at 275 mn hl p.a., valued at Eur 150bn. The Indian wine market has grown at over 20% (CAGR) over the period 1998-03, while in value terms, the growth has been over 25% in the same period. Red wine is the single largest type of wine consumed, followed by white wine.



Source: Industry estimates

In terms of price segments, it is the INR 200-600/1 litre bottle segment that is dominant accounting for over 75% of wine consumption of both red and white wine. Wine priced above INR 800/bottle accounts for only about 4% of the market.



Source: Industry estimates

Exhibit 7.2 C: Price segmentation of the white wine market (INR / Bottle)



Source: Industry estimates

A. Consumption trends

Wine is mainly consumed in urban India, with a high proportion being in the large metros. Mumbai accounts for approximately 40% of the country's wine sales followed by Delhi with 15%, Goa with 8% and Bangalore with 6%. This concentration can be attributed to the relatively large upper middle class and upper class population in Mumbai, Delhi and Bangalore. Goa, being a favourite tourist destination, also account for a significant proportion.

B. Key Players

Chateau Indage is the largest player in wine, with a market share of about 60%. The other key domestic players are Grover Wines and Sula Wines. Leading spirits players such as UB and Shaw Wallace also have a presence in the wine market. Some of the other Indian spirits players have also forayed into wines through distribution alliances with international companies- however the volumes of imports are small. Key international players who have a presence in India through distribution alliances include E & J Gallo, Hardy's etc.

All the key players in wine manufacturing in India have entered into technical collaborations with wine experts internationally to obtain the necessary knowledge in wine grape cultivation, wine making and marketing.

Global wine industry an overview

The global wine industry is experiencing a period of consolidation and adjustment as a result of cyclical and other causes impacting its performance. Over the 40 years until 2001, growth in wine trade worldwide

has averaged at a compounding annual rate of approximately 3.4%. Factors that have fuelled the rate of growth in world wine trade since 1991 include:

- The rising demand in emerging wine consuming nations.
- The growing supply from “New World” wine producers.
- The increasing popularity of the more easily accessible “New World” branded wines among the major retail chains, as well as with both high and low involvement consumers ; and
- The gradual move away from competing alcoholic beverages such as beer and spirits in traditionally high consuming regions.

Supply, demand and international Trade

At the consumer/retail level, the global wine industry is estimated at USD 150 billion, while at the wholesale level it stands at USD 60 billion. World wine production reached 258 million hectoliters in 2002, down from 266 million hectoliters in 2001. By volume, France made up the largest share of global production at 21% followed by Italy at 16% and Spain at 12%.

During 2002, EU production constituted 57% of wine produced globally, followed by the 'New World' wine countries (i.e. the US, Australia, New Zealand, South Africa, Chile and Argentina) representing 23% and the balance comprising the rest of the world. The US, a major consumer as well as a producer, had the single share (8%) of global production among the 'New World' wine nations. It processes over 90% of its wines in the state of California. Australia's position on the global wine map has grown in significance in recent times with its share of production rising from 2.8% in 1998 to approximately 4% in 2002.

Global Outlook

With the world principle goal of increasing their market shares, “ New World” wine producers are expanding production volumes and adopting aggressive promotion programmes. Consumers are opting for new world wines, because of several factors such as the ease of brand identification (as compared to old world wines, where identification is related to region of cultivation, rather than a specific brand), more fruity varieties and a perception of superior value for money for these products.

7.2.1 Key issues

A. Raw Material

Although 75,000 acres of land is under grape cultivation, wine grapes account for under 2000 acres currently. Maharashtra is the largest producer of wine grapes in India, cultivated over 1,800 acres of land, with Karnataka

accounting for the balance.

For every lakh liter of wine produced 35 acres of vineyard is required. The wine varieties yield about 3-7 tons per acre with an average of 4 tons, against an average of 8 to 10 tons per acre for table varieties. The lower yield is partially offset because the input requirements of wine varieties is half that of table varieties. Besides wine varieties are hardier than table varieties, which reduces risk. However, the key differentiator is realizations, which can be superior for wine grapes as opposed to table grapes, for sale in domestic markets.

B. Manufacturing

All wine manufacturers have faced capacity constraints, largely on account of lack of availability of raw material in order to service domestic demand. It is essential that direct farmer processor linkages be facilitated through amendment of the APMC Act, to encourage farmers to cultivate wine grapes. Further, requisite financing products from organized sources need to be made available, to enable a shift from table grapes to wine grapes. (Also refer to Volume I Financing of Agribusiness).

The cost of production in India is comparatively high since economies of scale have not been achieved yet. In addition, bottles, corks and shrink caps are usually imported, either because of non-availability or cost. Therefore, the cost of bulk wine of average quality from India works out to INR 50/- per litre. In contrast, bulk wine of good and consistent quality is available from Australia, Chile, Italy and France at less than 0.40 USD per litre.

This anomaly can only be addressed if direct processor-farmer linkages are facilitated and players are enabled to establish larger scale of operations.

As highlighted in Vol I, Chapter 7, there are no institutes which offer training/educational programmes for wine manufacturing. This is a lacuna that could be addressed by Government Research and Training Institutes.

7.2.2 Exports

In wine, the opportunity for exports is seen to be large. The willingness of western aficionados to try out different types of wine is likely to be the major driver. The success of New World wine makers in Chile and South Africa should be an excellent example to the Indian industry. The current size of the export market from India is about US\$ 250,000.

Exhibit 7.3.3 A: New world successes in wine

Chile

Chile has been acquiring an increasingly important presence in the global wine market. Chile produced 572.5 million litres of wine in 2002, a record level for the last 20 years, while wine exports reached 348.6 million litres, valued at USD 601.6 million. Chile's wine production in 2002 represented 2.1% of the world's total production (26,787 million litres) and 4.9% of the world's wine exports by value (USD 12.3 billion). Compared with the other New World suppliers, Chile accounts for 8.9% of the production and 26% of the export volume.

Over a period of about 10 years the industry has completely shifted its focus from the declining domestic market to a growing global market. Chile's strong elements include climate, space, low cost price (land and labour) and low disease pressure.

South Africa

South Africa has laid strong emphasis on enhancing quality in wines. From a traditional supply driven approach, largely catering to the demand of the domestic brandy and juice industry, major companies are now focusing on the requirements of the export market. This coupled with the country's natural advantages in terms of different terroirs, soil types and climate zones, within a comparatively small region, results in a broad range of wine styles.

7.3 Solution themes (common to beer and wine)

7.3.1. Uniform and reduced taxes

- It is important that the taxation structure be rationalized, with fewer heads of taxation as follows:
- Excise duties (which should compensate for any differences on account of export taxes)
- License fee
- Sales tax (which should compensate for any differences on account of import taxes)
- Miscellaneous (labeling etc.)

Further, given the high level of taxes, it is important that the overall level of taxation be reduced. Experiences from other countries reveal that lower taxes can, by disincentivising parallel markets, result in greater compliance and therefore higher tax revenues.

Case Study: Denmark

Prior to 2003, Denmark maintained a specific internal tax on spirits of DKK 275 (£25.22) per litre of pure alcohol, one of the highest tax rates for spirits in Europe and much higher than the rate in neighbouring Germany. The large difference in tax rates between Germany and Denmark provided an economic

incentive for illicit smuggling and cross-border trade activities to develop. As of March 2001, Denmark joined the Schengen Agreement, which obligated Denmark to eliminate compulsory Customs inspections of all intra-EU travellers. As Denmark dramatically reduced the number of Customs officers and inspections along the Danish-German border, all of the major spirits producers witnessed increased in sales of their products from German border shops. Concurrently, Danish retailers reported sales decreases of 40% on spirits sold in stores along the border, and an overall decrease of 10% in sales of spirits across Denmark for the period June-September 2001. Independent data analysis indicated that prior to March 2001, approximately 40% of all spirits consumed in Denmark were purchased elsewhere. Within 18 months, that proportion had grown to 51%.

In October 2003, the Danish government lowered its spirits excise tax by 45% to DKK 150 (£13.76) per litre of pure alcohol. The reduction meant, for example, that the total tax burden on a 70 cl bottle of spirits at 40% a.b.v. (including VAT of 25%) was reduced by DKK 43,75 (£4.09) per bottle, from DKK 96,25 (£9) to DKK 52,50 (£4.91).

Preliminary data indicate that the reduction in shelf price for spirits in Denmark has led to a 60% increase of spirits sales through tax-paid Danish outlets, and has reduced the level of cross-border trade to about 24% of the total spirits consumed. However, because the difference in retail prices between Denmark and Germany are still significant (i.e., around DKK 30-40 (£2.80-3.75) for a 70cl bottle €6.63 in Denmark vs. €4.23 in Germany), some consumers will continue to buy spirits abroad and through duty free outlets. The success in Denmark has translated into pressure on neighbouring countries to lower their tax rates as well. Consumers purchase spirits where they pay the lowest price, and there is a significant amount of

cross-border trade among the Nordic countries as consumers from higher taxed jurisdictions purchase alcohol in countries with lower relative tax burdens. When the taxes were lowered in Denmark, there was an increase in the volume of sales in Denmark to Danes, Swedes and Norwegians. Consequently, the Danish experience may have a domino effect as the governments in Sweden, Norway, and Iceland come under increasing pressure to lower their rates. Norway lowered its spirits taxes by 15% in January 2002 and an additional 9% in January 2003, and Finland reduced its excise tax on spirits by 44% as of March 2004, from €202 per litre to €114 per litre at 40% a.b.v.

Case study: Sri Lanka Beer

Sri Lanka reduced excise duty on beer in 1994 from 33.6 SLR/hl to 10 SLR/hl in 1999. This led to an over threefold increase in beer consumption (from 123000 hl in 1994 to 425000 hl in 1999), while Government revenues also went up (4.1 mn SLR in 1994 to 4.3 mn SLR in 1999)

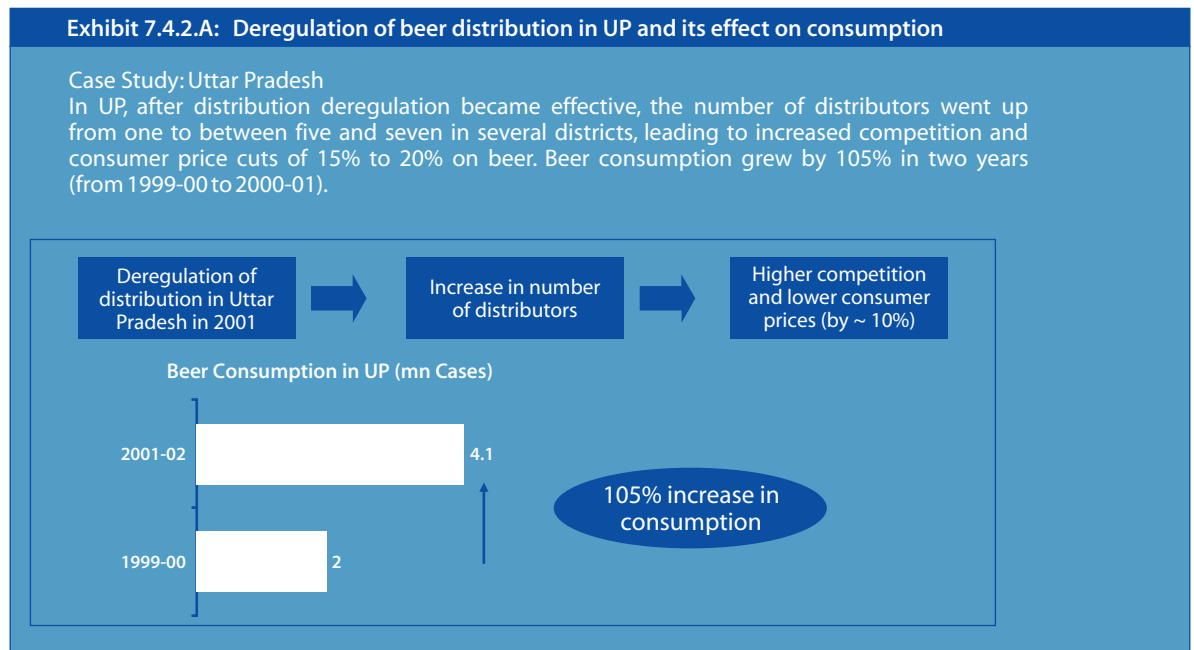
There is a clear need for a uniform tax structure and policy across states in India.

- Uniform excise rates
 - Uniform BIO policy
 - Gradual phasing out of export and import duties (which cause dispersion of manufacturing assets).
- These can be replaced by higher excise / sales tax rates to compensate the Government

Further, the Government will benefit (or at least not lose out) if the tax rates are reduced, as this will lead to higher consumption volumes, as seen in the case examples of Denmark and Sri Lanka. Orissa (population of 36.6 million) consumes 30% more beer than West Bengal (population of 80.2 million; State GDP 3.5 times that of Orissa) because duties, and consequently prices, are lower in Orissa.

7.4.2. Unshackle distribution

The open market (license) model, already prevailing in a few states, needs to be extended across the country. The case study of Uttar Pradesh below, highlights the benefits of a shift from an auction system to an open license system in 2000.



Source: Industry

Further, the Government needs to enhance the retail availability of alcohol. This would also lead to higher consumption of alcohol. For example, Kolkata, with approximately 100 liquor shops consumes 7.7 lakh cases of beer, while Mumbai, with approximately 500 shops consumes 51 lakh cases of beer per annum.

7.4.2. Solutions specific to wine

A. Promote direct farmer processor linkages

In order to enhance availability of wine grapes for local manufacturing, direct farmer processor linkages need to be fostered. In this regard, respective state Governments need to make the requisite modifications in the APMC Act. These linkages, backed by financing arrangements, will ensure a shift from other crops to wine grapes/variety change.

B. Market development

The Government can play an important role in promotion of Indian wine in overseas markets. At present, there is no Government agency which is undertaking this activity. The Ministry of Food Processing Industries could play a lead role in this area, and organize promotional events for Indian wine, in key target markets.

C. Training

Aligned with the market development efforts, the Government, through owned organizations, offer specialized training programmes on wine manufacturing. Some of the leading wine producing countries have research and educational institutions who focus on wine, as a distinct discipline.

7.5 Vision, strategy and action plan

The beer sector is expected to record growth of 15% p.a. till 2010 and 12% p.a. between 2010 and 2015. This implies that the beer segment would achieve volumes of 18 mn hl by 2010 and 31 mn hl by 2015. This translates into market potential of 193 bn by 2015.

The domestic wine industry has the potential to grow to INR 50 bn by 2010 and INR 90 bn by 2015. While the export market will remain competitive on account of new wine countries, India can carve out a niche for its wines, in line with the increasing preference for Indian foods. The investment required in the wine sector is estimated at INR 4.7 bn till 2010 and 4 bn between 2010 and 2015.

Exhibit 7.5.A: Market Potential for wine and beer: 2010 and 2015												
	Base Year	Current Market Size /Growth				Volume addition per annum	Market Size /Growth for 2010 and 2015					
		Current value (INR Million)	Average Price (INR /Ton)	Current Value (INR Million)	Current Growth (%)		Volume 2010 (Million Tones)	Volume 2010 (INR Million)	Volume 2015 (Million Tones)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)
Beer(million hectolitres)	2003	6.7	6054	41231	7%		17.8	109675	31.4	193284	15%	12%
Wine (mnl)	2003	4	650	2600			77	50000	138	90000	53%	12%

The summary of action steps is as follows:

- | | |
|--------------------|---|
| Central Government | <ul style="list-style-type: none"> • Market development efforts to promote Indian wine in overseas markets |
| State Government | <ul style="list-style-type: none"> • Shift to free market distribution, and remove controls on pricing • Rationalise state-level taxes on wine and beer • Increase area under wine grape cultivation by promoting direct farmer processor linkages • Training/education for manufacturing of wine |

Confectionery

8.1 Overview

The size of the Indian confectionery and chocolate market is estimated at INR 26.0 billion. Sugar confectionery accounts for 61% of this market, with the balance being chocolates and mints & gums.

Exhibit 8.1.A: Share of different segments in the Indian confectionery market



Source: Industry estimates

8.2. Sugar confectionery and gums

Market size: The organized market for sugar confectionery and gums is estimated at 139,000 tonnes valued at INR 12 bn. The market can be divided into 7 major categories, namely Hard Boiled Candies (HBC), Toffees, Eclairs, Chewing Gum, Bubble Gum, Mints and Lozenges. Hard boiled candies and toffees, together constitutes the largest segment accounting for 69% share. Gums are the second largest with an 18% share. Other key segments include éclairs, lozenges and mints. The confectionery market has been growing at over 6% annually over the last 5 years. However, gum-based confectionery has grown faster at over 10%. The following exhibit provides category-wise breakdown.

Exhibit: 8.2.A: Product category - wise breakdown



Source: Industry estimates

Structure: The confectionery market is highly fragmented with several local players. The unorganized segment is estimated to constitute 2/3rd of the total market, and has a strong presence in the HBC/Toffee segment.

8.2.1. Key players and market shares

Exhibit 8.2.1.A: Market shares in sugar confectionery market			
S.No.	Company	Major brands	Market Share %
1.	Perfetti	Brooklyn, Big Babool, Alpenliebe, Center Fresh, Chlor Mint, Golia, Cofitos	7
2.	Parry's/ Lotte	Coffy Bite, Lacto king, Coconut punch, Caramilk, Madras Cafe, Soft-Spot, Flavoured Candy, Mango, Sunshine, Shakti, Pineapple	10
3.	Parle's	Melody, Mango bite, Kismi, Poppins, Rola cola, LuxDairy, Peppermint, Rosemint	12
4.	GDC/ Joyco	Boomer, Bonkers, Donalds, PimPom, Mickey, Bonkers	8
5.	Nutrine	Mahalacto, Kokonaka, HoneyFab, Aam Ras, Chuma Chuma, Gulkand, Funda, Gum Yum, Ole, Nutrine Eclairs, SuperStar, Caramella, Wild Coffy, Dishum, Aasay, Naturo, Fruit Bar	26
6.	Candico	Minto, After smoke, Candy king, Americano, Orange-tutti frutti, Drum Beat, Vanilla Roll, Elaichi roll, Big Freedom, Jumbo-Gumbo, LocoPoco, Minto-Fresh	8
7.	Ravalgaon	Pan pasand, Mango mood, Coffee break, Hi-Soft, Supreme, Cherries, Juicy	6
8.	Wrigley	Wrigley's chewing gum, Spearmint, Boomer, Juicy Fruit Double mint, Spearmint.	3
9.	Nestle	Polo, Allen's Splash, Soothers, Toffo Butter, Fruit Rings, Fox's	4
10.	Cadbury's	Googly, Mocka, English toffee, Frutus, Gollum, Eclairs, Pops.	4
11.	HLL*	Max	5

Source: Rabobank Research, * Business will be discontinued

Exhibit 8.2.1.B: Anticold/other OTC brands also sold as confectionery		
Company	Market Share (%)	Major brands
Dabur	2	Hajmola
P & G	1.2	Vicks
Warner Lambert	2.4	Halls, Chiclets, Clorets

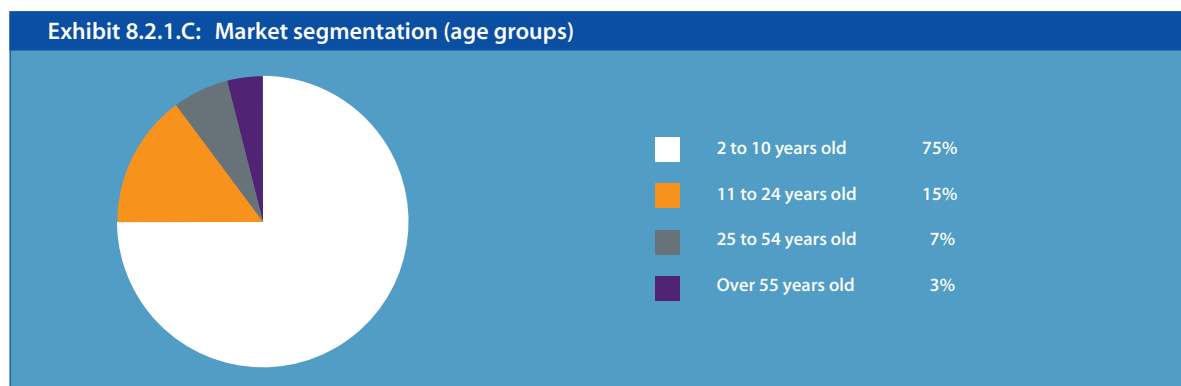
Source: Rabobank Research

Penetration: The overall market penetration in confectionery is estimated at 15%. The estimated penetration of the urban and the rural market is 23% and 11% respectively. The per capita consumption in India is estimated at 250 gms as compared to 8-10 kgs in most European countries. Fragmented distribution and consequently poor reach, particularly in rural areas, is cited as the most important reason for low penetration

levels.

Product offerings: Several multinational as well as Indian companies have forayed into the market in the last few years, thus making available a wider range of product offerings in innovative packaging.

Market segmentation: The confectionery market can be segmented by consumer age groups, with about 75% of consumption being in the age category of 2 - 10 years. Consumption of mints however, follows a different pattern with a high proportion being in the 15 - 25 years bracket.

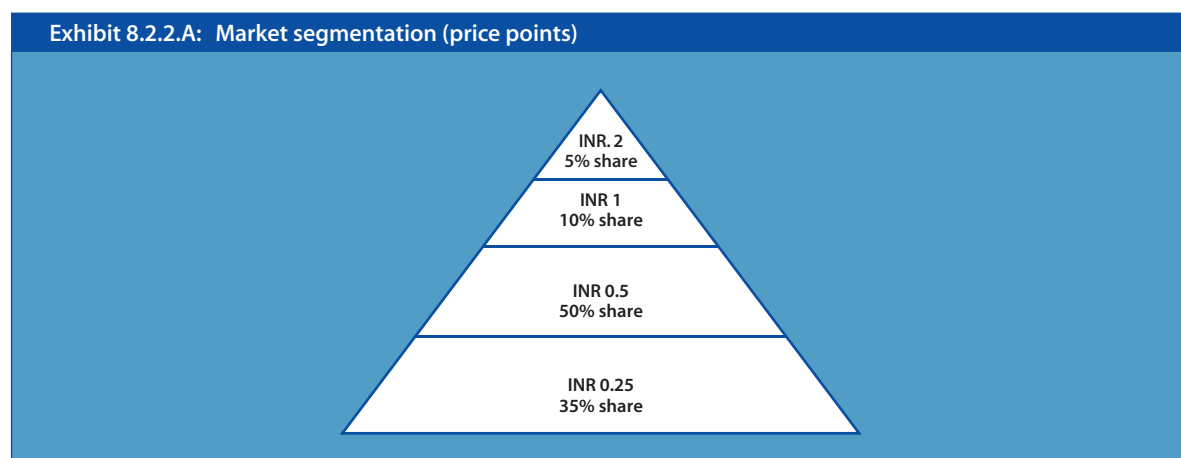


Source: Rabobank Research

8.2.2. Demand drivers

Innovation: Innovation is a key driving factor of demand. Therefore, most players aim to create excitement through new flavours, innovative packaging, as well as giveaways such as tattoos, stickers etc. Further, this demand composition necessitates effective use of media to reach children as they are the principal decision makers for purchase of confectionery.

Pricing: Unlike developed markets, confectionery is predominantly in single/few unit packs. Therefore, price points become a critical factor in determining choice. The 50 paise segment, has a 50% share of the market, followed by 25 paise which has a 35% share. The latter is largely dominated by unorganized players. Branded confectionery players are largely focused on the 50p/INR 1 category.



Source: Rabobank Research

8.2.3. Distribution

The distribution channel for confectionery, is similar to that for other fast moving consumer goods. However in addition to local kirana stores and large retailers, paan and cigarette outlets are covered extensively, given the need for widespread availability to induce consumption. The cost of distribution is high, as coverage has to be extensive, including in rural outlets.

8.2.4. Opportunity for exports

The Indian industry can engage in contract production of confectionery for the international markets, owing to lower manufacturing costs. There is immense scope for export of sugar confectionery to the US and West Asia. In addition, there is potential to supply confectionery to African markets, currently serviced by Brazil which has a 50% share in this region. Indian producers can also tap the Russian & the EU market for lozenges.

8.2.5. Key issues in sugar confectionery segment

Although players have been engaged in aggressive sales promotion, the overall penetration level has not registered any significant increase. Some of the issues faced by the Indian confectionery market are as follows

- Reservation of manufacturing of hard-boiled sugar candies for the small scale sector, is an unnecessary hindrance for players who plan to set up owned facilities for manufacturing.
- Increase in raw material prices has resulted in a squeeze on margins, as companies are unable to pass on the higher costs to consumers

Exhibit 8.2.5.A: Cost of production of confectionery		
Particular (INR/kg)	Cost	Remarks
Cost of raw material	24.7	
Cost of packing material	15.8	
Processing charge	5.0	
Freight	3.0	
Sales tax	4.8	@ 8%
Excise duty	3.6	@ 8%
Distribution margins (Stockist)	3.3	@ 5%
Distribution margins (Retailer)	6.8	@ 10%
Consumer Price	75	
Gross margin to Manufacturer	8.02	

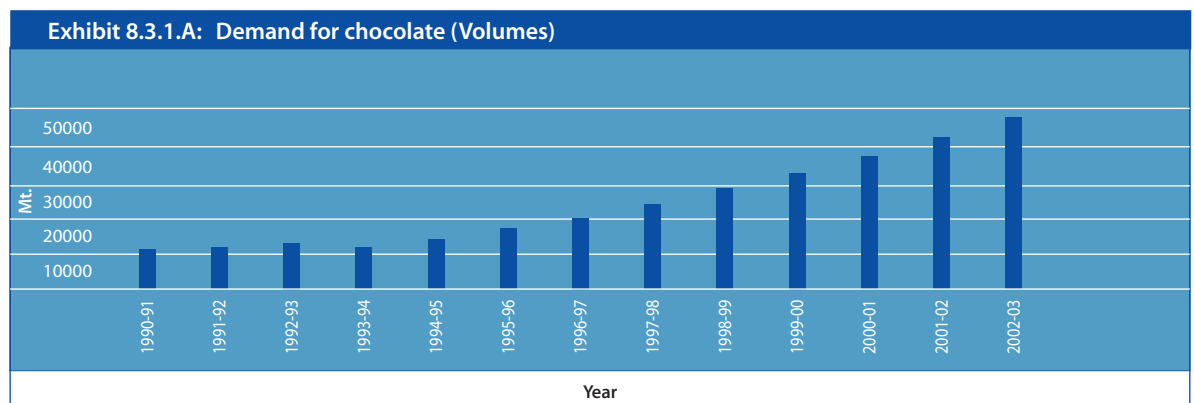
Source: Rabobank Research

- Indian confectionery products are not accepted in the international market, mainly due to lack of innovative options.
- The Government of India has banned imports of certain additives and ingredients, which are used for making confectionery. While these are banned in India, these are permitted by other countries. This ban needs to be removed
- The organized sector in confectionery is at a disadvantage as compared to the unorganized sector, due to lack of imposition of taxes on the latter. Confectionery as well as chocolate, being food products should be provided preferential treatment with nil taxation. Current taxes include excise duty of 8% and sales tax and octroi (in some states), at the state-level.
- Non-availability of base gums restricts the production of chewing gums. Most of the base gum needs to be imported from Europe and South East Asia, thus increasing cost of manufacturing for Indian players. The Government should promote research and infrastructure development for base gum production in India.
- Indian government regulations forbid the manufacture and sale of confectionery products containing artificial sweeteners. This hampers the ability of confectionery players to offer innovative products.

8.3. Chocolate

8.3.1 Overview

The market for chocolate has grown at 12% annually over the last decade. Growth has been more rapid in the period 1997-2002, in line with increased disposable incomes and higher propensity to spend on impulse categories such as chocolate.



Source: Industry estimates

8.3.2. Segment-wise share

Moulded chocolates are the most preferred, with a market share of 50% by volume, followed by counts (33%) and sugar and panned chocolates accounting for the remainder. In recent years, new categories of chocolates such as liquid chocolate sticks have been introduced at low price points and have therefore been able to garner significant share.

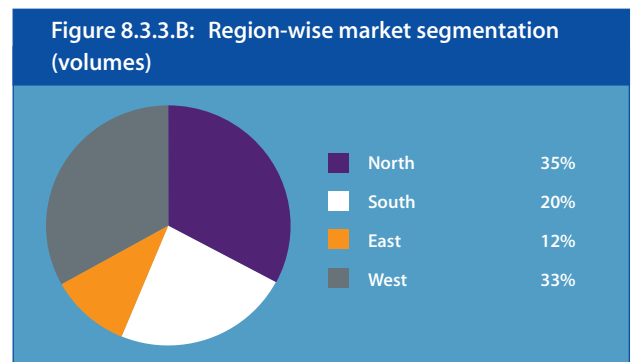
8.3.3. Key players

The key players in the Indian confectionery market are Cadbury, Nestle and Amul which have a national presence. Besides these national players, there are a few regional companies such as Campco, Lotus etc. The unorganized sector is mainly present in the counts segment. The North and the West account for the highest share of the chocolate market by volume, followed by the South and the East.

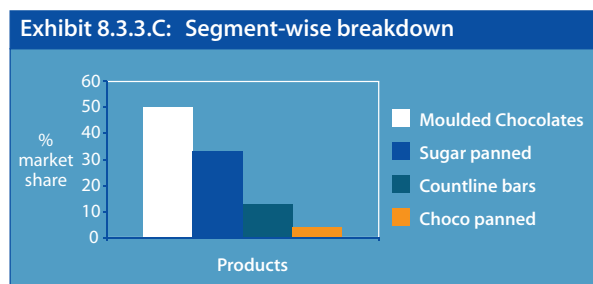
Figure 8.3.3.A: Market share

Company	Share(%)	
	Moulded	Countline
Cadbury's	66	70
Amul	5	-
Nestle	22	18
Others	7	12

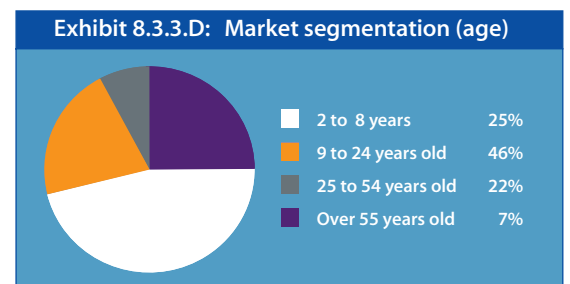
Source: Industry



Market segmentation: As compared to sugar confectionery, chocolate-based products are consumed by older age groups, with the 9-24 years group being dominant.



Source: Rabobank Research



8.3.4. Penetration

Urban markets (metros, B and C class towns) accounts for 85% of sale of chocolate. However, current penetration levels are low at about 30%, indicating significant room for growth. As compared to confectionery, purchase of chocolate is less impulse-driven. Brand loyalty is comparatively higher for chocolate. Other important drivers include availability and point of sales promotion. Unlike confectionery, price, though important, is not the key determinant of purchase.

8.3.5. Imports

During the year 2003, India has imported US \$ 2.61 billion of chocolate and food products containing cocoa. Given increasing competition, multinational companies such as Cadbury and Nestle are introducing their global product offerings in India.

8.3.6. Key issues- chocolate

Some of the issues in the chocolate segment are as follows;

- Excise and state-level taxes, result in significant cost build-up for chocolate. This has been one of the factors hampering growth of the segment. Further, this creates a non-level playing field for branded players.
- High seasonal fluctuation in sugar and cocoa prices, which are the key raw materials for chocolate

8.4. Global confectionery markets

Total confectionery sales in 2003 amounted to US \$111.0 bn in value terms, representing a near 10% increase over 2002. The market can be classified into chocolate, sugar based confectionery and chewing gum. Chocolate is the largest selling confectionery product, with sales of about US \$61 bn in 2003. The sector grew by nearly 11% in value terms in 2003, underpinned by the trend towards premium products and indulgence in many developed markets, and a growing interest in chocolate, as storage facilities and disposable incomes improved in other markets.

Exhibit 8.4.A: International Market segments		
Value 2003	(US\$ in bn.)	Annual Growth rates (%)
Chocolate	61.1	3.0
Sugar	37.2	3.9
Chewing gum	12.7	3.5

Source: Rabobank Research

8.4.1 Growth factors:

- The industry continues to grow driven by increased consumption of confectionery as snacks.
- Increasing demand for health products is leading manufacturers to offer healthier confectionery products
- Innovation is key to market development and has become central to corporate strategy

8.4.2. Other key trends

- The current worldwide imperative for healthy living has not adversely impacted the global confectionery market, with companies managing to adapt to address these challenges. Some of the key trends in the confectionery segment are as follows:
- Gum was the fastest growing sector from 1998-2003, at 13% in volume terms and over 17% in value terms, driven by developments in sugar-free and functional gum. However, bubble and sugared gum are still growing in regions such as the Asia-Pacific
- Gum is increasingly competing with power mints. Witnessing spectacular growth at the start of 1998, power mint sales have started to tail off as consumers opt for longer lasting and healthier sugar-free gum.
- Most recently, gum has witnessed competition from breath strips. These products have been rolled out in the UK and Australia following initial success in the US. However, the widespread appeal of these products is still untested.
- There is a distinct shift from sugared products on a global level, as a result of the increasing concern among consumers over health. Therefore, manufacturers are developing healthier options such as sugar-free chocolate and functional products which clean, whiten and freshen breath.
- Sugar confectionery suffered from the trend in favour of chocolate in developed markets, where sugar products have a cheap image. Sugar confectionery has fought back in developed markets with the launch of sugar-free and fruit-based products appealing to consumers' health-consciousness, although vitamin-enriched products have done less well.
- Australasian, North Americans and Western Europeans have a marked preference for chocolate. Its dominance is partly attributable to high levels of consumer affluence, as well as a favourable year-round climate and a well-developed retail network offering suitable conditions for storing chocolate.
- In developing markets such as Eastern Europe and Asia Pacific, the perception of chocolate as a luxury product is shifting, as rising levels of consumer affluence and intensified competition between domestic and multinational companies resulted in more affordable prices. In China, the recent trend of gifting chocolate at wedding banquets has led to sales growth.

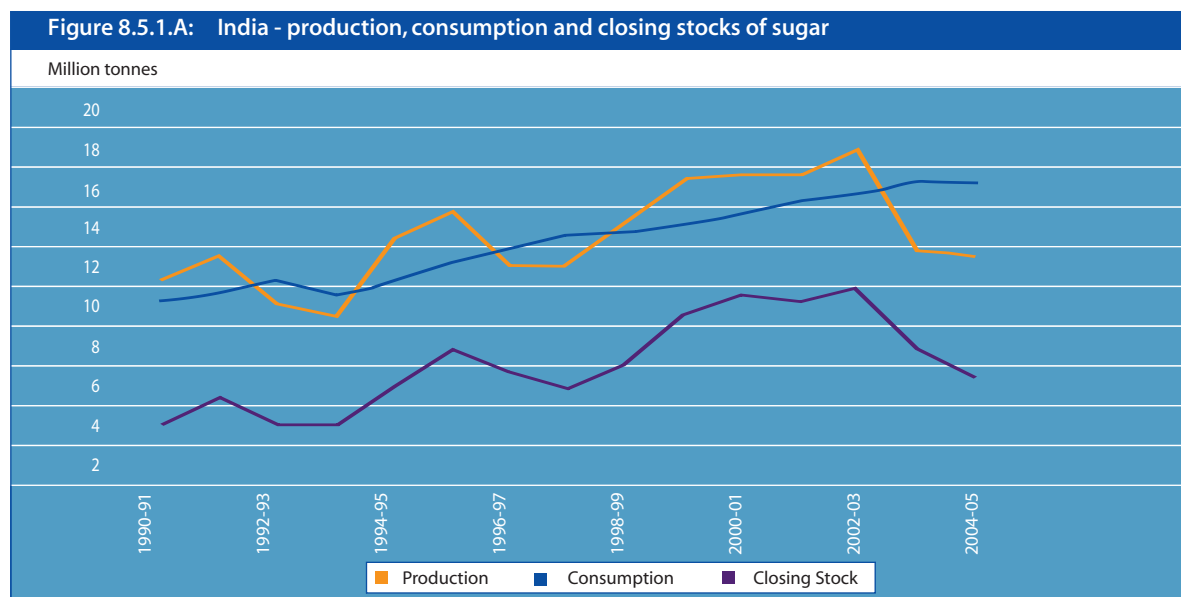
China has achieved the highest growth in confectionery over the 1998- 2003 period in value terms, although per capita consumption remains low. Over the next five years, the country's confectionery market will grow on the back of China's new regulations on confectionery which have allowed entry to 500 new types of candy since July 2002.

Recent raw material price increases have translated into higher production costs. Manufacturers have responded by achieving greater vertical integration and improving economies of scale. The operating environment, too, has changed. Modifications in legislation and the opening of trade barriers can have a significant impact on manufacturer strategy

8.5. Raw materials for confectionery

8.5.1. Sugar

India is the world's leading consumer of sugar, accounting for 14% of total global sugar consumption (18.6 million tonnes). India is also the second largest producer of sugar (15.4 million tonnes), next to Brazil. At present, about 4 million hectares of land is under sugarcane with an average yield of 70 tonnes per hectare. Traditional sweeteners account for one third of cane consumption. Given that they are produced in the small scale sector, these sweeteners are completely free from controls and taxes which are applicable to the sugar sector.



Source: Rabo India, Industry Estimates

A. Supply - According to industry sources, sugar production has remained high from 1999-00 to 2002-03, given that the returns to farmers were higher in sugarcane than in other crops, in spite of the delay in payments for cane arrears. However, this scenario has changed in the year 2003-04 owing to the failure of the monsoons in the western and southern regions of the country. The current production estimate for the year ending September 2004 is 13.8 million tonnes. In addition, the woolly aphid, an insect pest of cane, caused further damage to crops in Maharashtra and Karnataka. Sugar production in 2004-05 is estimated at 13.5 million tonnes, which is likely to necessitate imports of over 3 million tonnes in 2004-05.

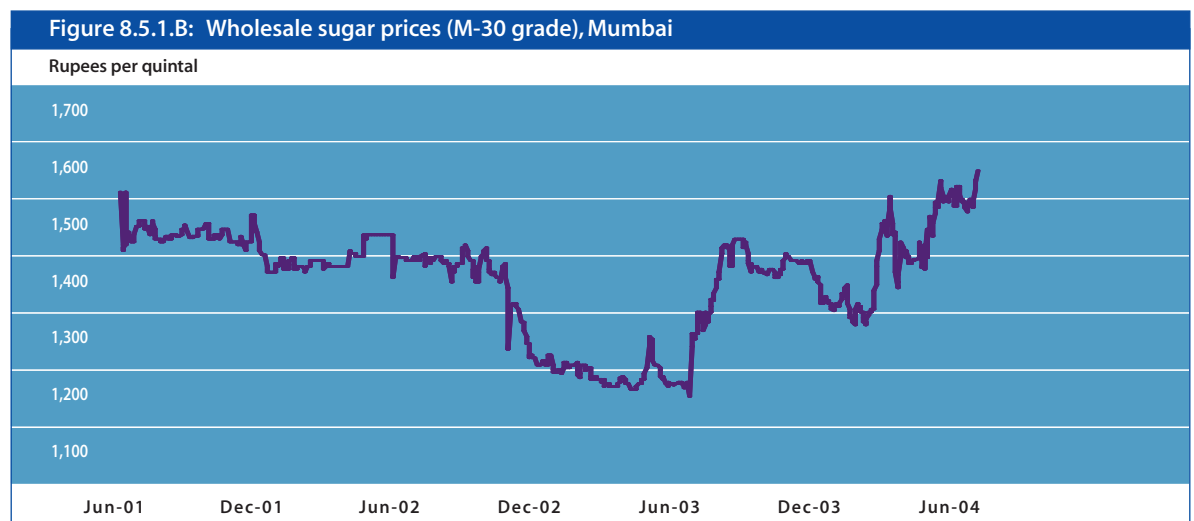
B. Demand - Demand for sugar is likely to grow at a CAGR of 3.5-4% in the next 10 years, based on industry estimates. The growth in demand can be attributed to continued growth in population, higher income levels

and consumer preference for sugar vis-à-vis alternate sweeteners. Industrial consumption for sugar is also growing rapidly, particularly from the confectionery, aerated beverages and ice cream segments.

C. Sugar Prices - The Indian sugar industry operates with a dual pricing system for its sugar output.

Levy prices - 10% of sugar is procured by the government for the Public Distribution System (PDS) at a subsidised price called the “levy price,” which varies from region to region.

Free market prices - The remaining 90% of production by sugar mills can be sold in the open market, but only up to a fixed quantity decided by GoI for each factory (Monthly release quotas), based on the demand supply situation in the country. This regulation is distortionary, and does not allow market forces to determine prices.



Source: Rabobank Research

D. Sugarcane prices - Each year, the GOI declares a Statutory Minimum Cane Price (SMP). At present, the SMP is INR 73/ quintal and is linked to a recovery of 8.5%, carrying a premium of INR. 0.85 for every 0.1% additional recovery. In some states, such as Punjab, Haryana and Uttar Pradesh, sugar mills have to pay the effective state advised price (SAP) for sugarcane, which is higher than the MSP. For example, the SAP in Uttar Pradesh is currently INR 95 a quintal.



As depicted above, the farmer is not benefiting due to the current pricing policy, as the net return can be

¹³ SMP in 2002-03 was INR 69.5 for 8.5% recovery + INR 0.85 for every 0.1% increase in recovery. At 10% recovery, this works out to INR 82.25 per quintal

significantly lower due to delay in payments by sugar mills. Farmers, in need of immediate cash payment, often resort to bill discounting with moneylenders. This offers them a net realisation of INR 65-70 per quintal against an SMP of INR 82.25. Increasing diversion of cane to gur and khandsari manufacturers (who pay cash on the spot) tends to be a feature of the market when millers delay payments to growers. Cane payment arrears were reported to be INR 30 billion at the beginning of the 2003/04 season, and USDA data indicated that cane diversion to gur production rose sharply during 2003/04.

The successive increase in cane prices in past years, mainly politically driven, has translated into an abnormally high cost of production of sugar, now estimated at INR 12-13 per kg. The high cane prices, which are out of line with market conditions, have forced several manufacturing units to shut down. Local industry has been strongly advocating rationalisation of the cane pricing policy (by linking it to sugar prices in the domestic/world markets).

A rational and market-driven relationship between input (sugarcane) costs and output (sugar) prices needs to be established. If sugarcane prices are market determined, it could lead to prompt payment to farmers and lower cane arrears. Brazil, the leading producer of sugar, does not have any market-distorting regulations on either cane or sugar.

Even if the current model of cane pricing were to continue, the industry could pay the cane farmer a certain % of the price, while the rest could be paid by the government through an income support system. This would ensure that final consumer prices are kept under check and processors are not rendered unviable due to high cane prices. For more details on the income support system, refer to Volume II Chapter 9.

8.5.2. Cocoa

The area under cocoa cultivation in India is nearly 17,800 hectares. Contract production of cocoa has helped in increasing production, estimated at 10200 MT in 2002-03. However, domestic demand is significantly higher, estimated at nearly 3x production.

Kerala is the leading cocoa producing state in the country. The attractive pricing for cocoa pods and beans, coupled with large scale distribution of planting materials resulted in a record 29,000 ha under cocoa by 1980-81. However, lack of forward linkages led to a decrease in interest in cocoa cultivation and a shift to other crops. Inadequate marketing network and fluctuations in prices developed a sense of insecurity among farmers, thus leading to reduced cultivation of cocoa.

Exhibit 8.5.2.A: Cocoa production trends, Key States						
State	2001-02			2002-03		
	Area (Hac.)	Production (MT)	Productivity (Kg./hac)	Area (Hac.)	Production (MT)	Productivity (Kg./hac)
Kerala	8680	4100	472	8700	6500	747
Tamil Nadu	350	180	500	400	200	500
Karnataka	4400	1700	402	6000	2500	416
Andhra Pradesh	2700	800	460	2700	1000	370
Total	16130	6780	500	17800	10200	560

Source: Directorate of Cashew and Cocoa Development

Key Issues

- Low productivity of Indian varieties of cocoa.
 - High incidence of purchase tax (13%) in Kerala, which increases cost of cocoa
- There is a need to enhance production of cocoa in the country, in view of growing domestic demand. This challenge can be suitably addressed through the following measures:
- Facilitate direct farmer producer linkages through modifications in APMC Act, which will result in assured offtake . These will also enable adoption of superior crop management practices
 - Introduction of superior varieties using clonal technology to improve yields
 - Introduction of suitable intercrops such as coconut, arecanut which can lead to higher returns for farmers
 - The State Government could play an important role in promoting cultivation of cocoa through establishment of nurseries and distribution of seedlings
 - The State Government could also introduce price hedging for cocoa and subsidize the cost of the premium of the option position

8.6. Vision, strategy and action plan

Sugar and sugar-based products are envisioned to grow from INR 261 bn to INR 373 bn by 2010 and INR 516 bn in 2015. While growth in the sugar sector will be driven by higher volumes, the confectionery and chocolate segment will expand on the back of increased volumes as well as increased value addition. While the confectionery segment will grow nearly 6-fold by 2015, the chocolate segment will grow 7-fold over the same period.

Exhibit 8.6.A: Vision and investment- sugar and sugar-based products																	
	Current Volume (Million Tonnes)	Average Price (INR/Ton)	Current Value (INR Million)	Current Growth (%)	Value addition per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)	Current capacity (Tonnes/Day) & Utilisation (%)	New capacity required (2005-10) Tonnes/day	New capacity required (2010-15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2010-15) (INR Million)	Total Investment (2005-15) (INR Million)
Sugar	20.1	12000	241200	4%		26.45	31403	32.2	386169	4%	4%	136549	37466	37701	74931	75402	150333
												92%	95%	95%			
Confectionery	0.139	86000	11954	7%	8%	0.22	30461	0.35	70187	12%	8%	662	268	528	1039	2048	3087
Chocolates	0.035	23000	8050	13%	5%	0.08	25379	0.15	59679	15%	13%	212	210	300.1	7880	75402	150333
Capacity utilisation confectionery (%)											70%	80%	80%				
Capacity utilisation Chocolates(%)												55%	65%	70%			
Sub-total Sugar and Sugar Base	20.27		261204			26.76	373243	32.68	516035						83851	88705	172556

8.7. Action plan

Central Government	<ul style="list-style-type: none">λ Nil excise on chocolate and confectioneryλ Aid research for base gum and gum related productsλ Promote India as a sourcing hub for confectionery products
State Government	<ul style="list-style-type: none">λ Nil sales and other indirect taxes on confectionery and chocolate productsλ Establish rational market-driven cane pricing policy based on linkage between input and output costλ Decontrol of the sugar sector with removal of levy and quota systemsλ Promote intercrop cultivation of coconut, arecanut etc. through schemes in cocoa farms to supplement incomesλ Price hedging mechanism through part subsidies for premium of options traded in international exchangesλ Facilitate direct processor-farmer linkages to enhance output of cocoaλ Direct income support for sugarcane farmers

Grains and Grain-based products

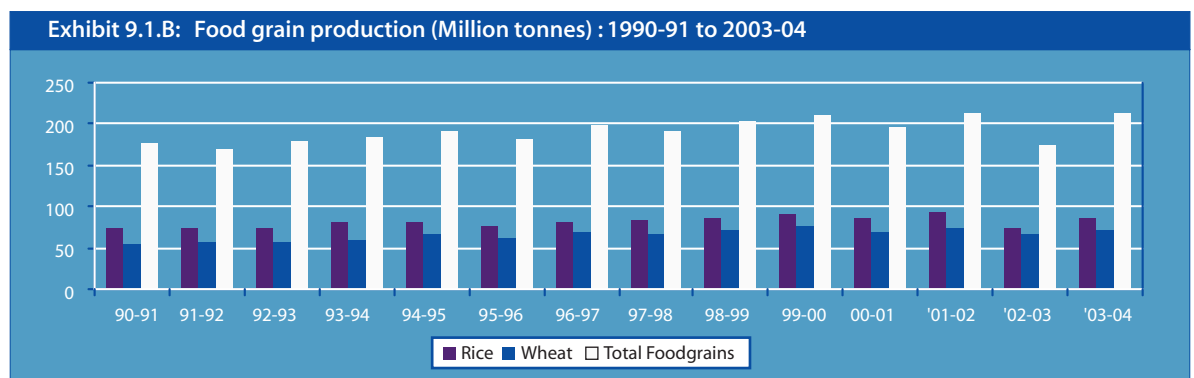
The Grains sector in India comprises Rice, Wheat, Maize, Jowar, Bajra and Barley. Wheat, Rice and Maize, together, account for 82% of total production.

9.1 Production

India is the second largest producer of rice and wheat in the world. While total food grain production has been approximately 200mt over the last five years, there was a considerable dip in production in 2002-03 due to the adverse impact of a bad monsoon. Total food grain production stood at 212 million tonnes in 2003-04.

Exhibit 9.1.A: India's production of foodgrains in 2003-04			
	2003-04 Production in India (Mn tonnes)	% share of world production	India's rank in world production
Total	212.0	11	3
Rice	87.0	22	2
Wheat	72.1	12	2
Maize	14.7	2	6
Jowar (Sorghum)	7.3	14	3
Bajra (Pearl Millet)	11.8	36	1

Source: Ministry of Agriculture Govt. of India, FAO



Source: Ministry of Agriculture - Government of India

While Rice and Wheat together constitute the staple diet of almost the entire population in the country, over 50% of maize is utilized for manufacture of poultry feed production. The balance is either dry milled and consumed as staple food, or wet milled for producing starch and starch-based derivatives and by-products.

9.1.1. Wheat

Most of the wheat produced in India is 'bread wheat' which is soft or medium hard, with medium protein content. This variety of wheat is mainly grown in the Northern Indian states of Punjab, Haryana, Uttar Pradesh and Rajasthan. 'Durum' or hard-wheat which is typically hard, with high protein and high gluten strength, is grown in Central and Western India.

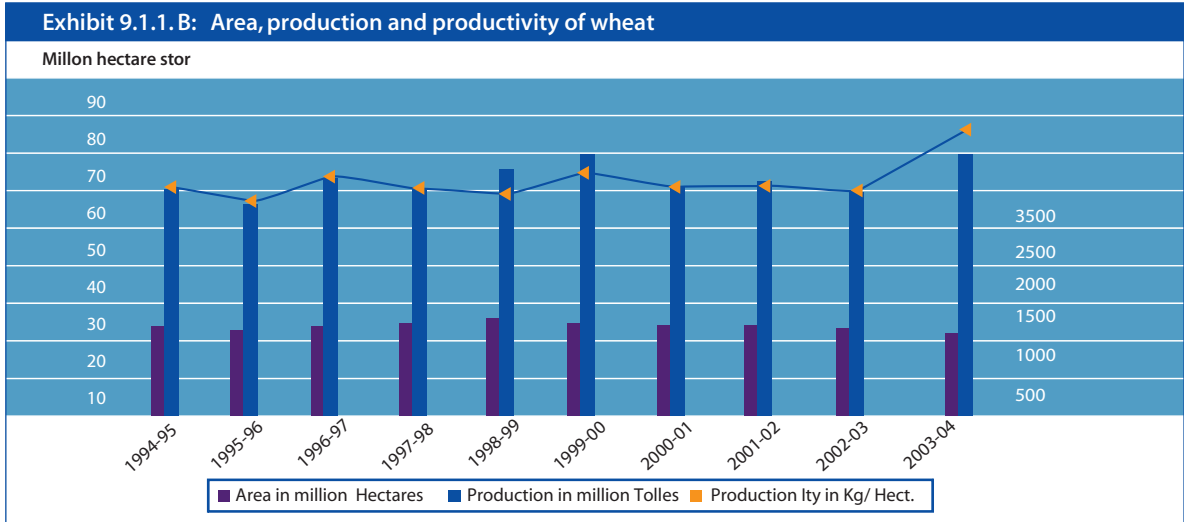
Exhibit 9.1.1.A : Durum Wheat The Export opportunity

The production of Durum wheat has been gradually increasing, from about 1 million tonnes in the late 1980s to 2.5 million tonnes in 2002-03. Approximately eight to ten million tonnes of durum wheat, valued at USD 2600 million is traded annually. According to experts, the Middle East, South Africa and Mediterranean countries are the potential clients for Indian durum. In these countries, where two-layered bread and single layered bread are made from durum wheat, domestic production is insufficient to meet requirements.

Indian durum varieties have a high level of resistance to leaf rust and diseases like loose smut and Karnal bunt. The regional wheat station of the Indian Agriculture Research Institute (IARI) at Indore, has developed varieties such as Raj 1555 and HI-8498 which are in demand in international and domestic markets because of their high protein content and disease-free characteristics.

Durum wheat is produced in comparatively dry and hot climatic conditions. However, the productivity is low, estimated at 2 tonnes per hectare compared to 2.5 tonnes per hectare achieved in Canada. According to experts, there is an urgent need to step up per hectare productivity of durum wheat grown under residual moisture. Wheat scientists at the Directorate of Wheat Research (DWR), Karnal state that the main reason for low production is non-adoption of requisite moisture conservation steps, improper farm machinery and inappropriate genotypes. The experts added that through use of sprinkler irrigation, durum productivity can be increased substantially.

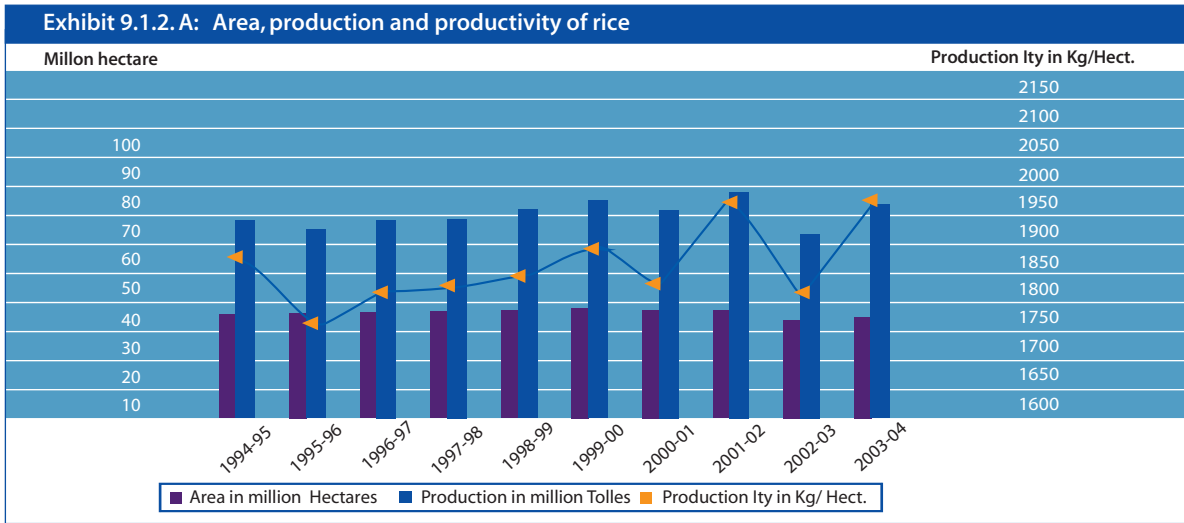
Though wheat acreage has been gradually increasing over the past decade, yields have stagnated at around 2.4-2.7 tonnes/ha. In 2003-2004, wheat production was estimated at 72.1 mn MT cultivated on an area of 26.62 million hectares, up 16.7 percent over the previous year's production of 65.1 mn MT.



Source: Ministry of Agriculture, Government of India

9.1.2 Rice

Unlike wheat, rice is primarily cultivated in the kharif season, under rain-fed conditions, except in the rice surplus states of Punjab, Haryana and AP. The high dependence on monsoons results in significant degree of fluctuation in rice production. It is estimated that more than 4000 varieties of rice are grown in India.



Source: Ministry of Agriculture, Government of India

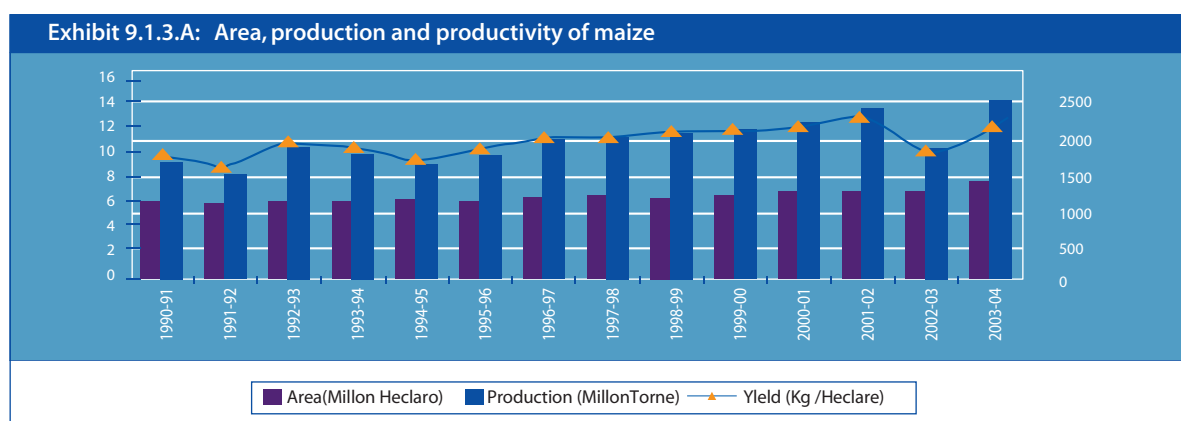
Rice is classified into two categories for government procurement purposes:

- (1) 'Common' which has a length to breadth ratio of less than 2.5 and
- (2) 'Grade A', which has a length to breadth ratio of more than 2.5.

The paddy support price for 2003-2004 was unchanged from the 2002-2003 level at INR 5500/tonne for Common grade and INR5800/tonne for Grade A. Bulk of procurement by the Government is in the form of paddy bought at the minimum support price. Following a steep decline in production last year, government procurement declined sharply to 16.4 million tonnes in 2002-2003 from 21.3 million tonnes in the previous year. Procurement in 2003-2004 is likely to increase to 18.5 million tonnes on the back of higher production.

9.1.3 Maize

Maize is a relatively less-preferred crop for cultivation, in a regulatory environment which provides attractive support prices for competing grains rice and wheat. As maize is primarily a rain-fed crop, the annual production level is dependent on monsoons, and therefore displays significant fluctuations. (Also refer Chapter 4 on Meat and Poultry).



Source : Ministry of Agriculture, Govt. of India.

9.2 Processing

Though the potential for value addition is high in both wheat and rice, most produce is subjected to primary processing. More than 65% of wheat is converted into 'Atta' (wholegrain flour) produced by unorganized players (through small milling units called 'chakkis') as well as by organized roller flour mills. Atta is in-turn consumed as chapatis or rotis. (unleavened flat bread).

Exhibit 9.2.A: Wheat milling			
	Wheat milled (Million tonnes)	No of units	Avg. Cap. Utilization (%)
Home grinders	<1	N.A.	N.A.
Chakkis	42.5	400,000	71%
Roller flour Mills	12.5	900	45%

Source :Industry Estimates

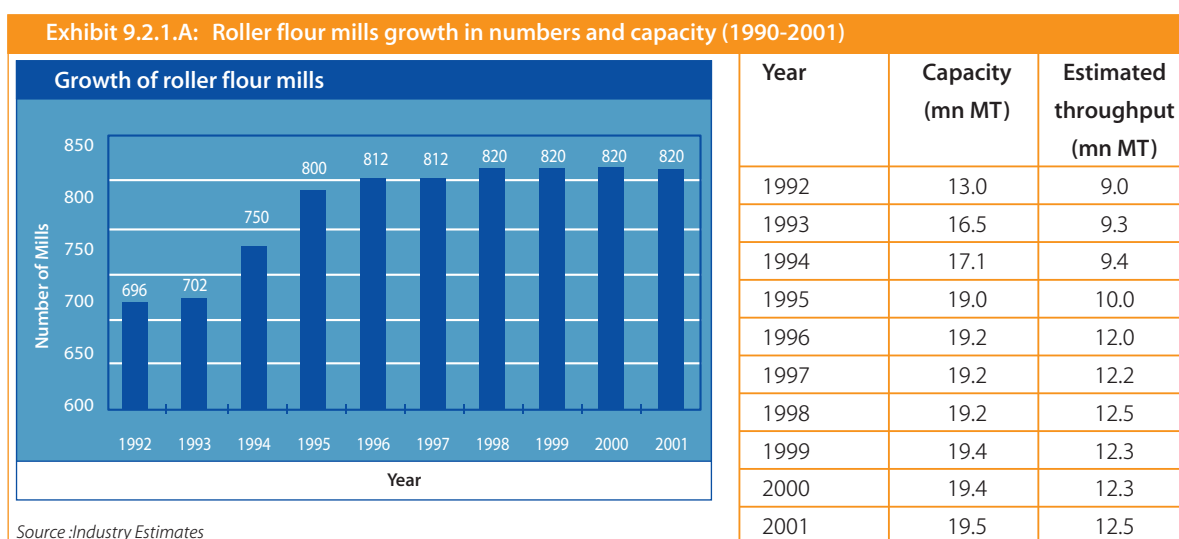
While 94% of rice is consumed as polished rice (milled mostly by hullers and automatic shellers) 6% is utilized in other primary processed products namely parboiled rice, parched rice and flaked rice. A small proportion is used for starch production while rice bran, a by-product of rice milling, is utilized for rice bran oil production.

India is the second largest producer of rice in the world next to China, with potential to produce about 1 million t of Rice Bran Oil per annum. Currently, the industry processes about 3.5 million tonnes of Rice Bran leading to a production of about 0.65 million tonnes, of which 0.60 million tonnes is of edible grade. An additional 0.33 million tonnes could be produced. This would require modernizing of huller rice mills and installation of Rice Bran oil refineries. This would result in reduction in broken rice, separation of husk and bran with the latter available for commercial use, as raw material for solvent extraction of rice bran oil.

9.2.1. Roller flour milling

The Roller Flour Milling Industry has undergone a gradual shift towards greater processing and value added products.

- Maida, in addition to being used by the bakery industry for biscuits and parota stalls (unorganized) is now being used in the preparation of value-added products such as vermicelli, macaroni, noodles and pastas.
- Another emerging trend is fortification of flour with iron, folic acid etc., to improve the nutritional quality of diets.



Source :Industry Estimates

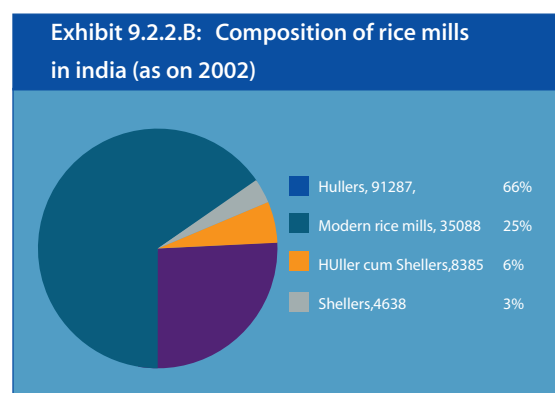
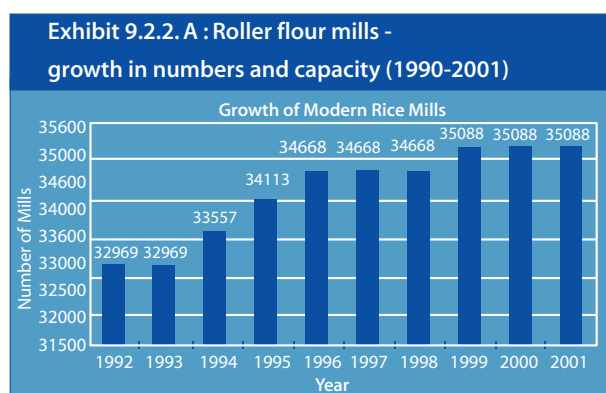
¹⁴Data from Central Organisation of Oil Industry and Trade (COOIT)

Capacity utilization has been low largely due to several reasons, including presence of a large unorganized milling sector, excess build-up of capacity, low priority for movement of wheat from wheat producing states to other states and Government levies and taxes on processed wheat-based products, which have translated into low operating margins for industry players.

The Indian Roller flour mills are operationally far inferior to mills in developed countries in terms of scale and efficiency norms. The typical size of a RFM in India is 70 tpd vs 1000 tpd in North America. The high energy consumption of some mills, due to obsolescence is also adversely affecting the efficiency of milling.

9.2.2. Rice milling

As in the case of wheat, capacity utilization in rice milling is low. There are about 35000 modern rice mills in India which account for around 25% of the total number of rice mills. It is estimated that over 90,000 rice hullers need to be upgraded to increase the level of efficiency. The slow rate in modernization of hullers is attributed to the compulsory levy on rice mills imposed in most states, which results in low profitability and consequently limited ability to invest in upgradation.



Source: Ministry of Food Processing Industries

Hullers achieve a maximum of 65% yield with 20-30% of output in broken form. While most modern rice mills (single pass) have a capacity of 2-4 tonnes per hour, mini modern rice mills have capacities ranging from 150-550 kg per hour. Modern rice mills have a yield recovery of 70% percent with grain breakage of 10%.

The advent of modern rice mills and 'huller-cum-shellers' has not only resulted in increased milling efficiency of rice but has also had a positive spin-off on rice bran oil extraction, both in terms of quality and volume of production. The present level of rice bran output of 3.4 million tonnes has led to production of about 0.53 million tonnes of rice bran oil besides a large quantity of rice bran cake, which is being utilized by the animal feed industry, both in the domestic as well as in the export markets.

It is possible to increase the total output of superior quality rice by 10 per cent with improved harvesting, parboiling, drying and milling technologies. The increase in rice output could be about 8 million tonnes translating into incremental economic value of approximately INR 80 billion.

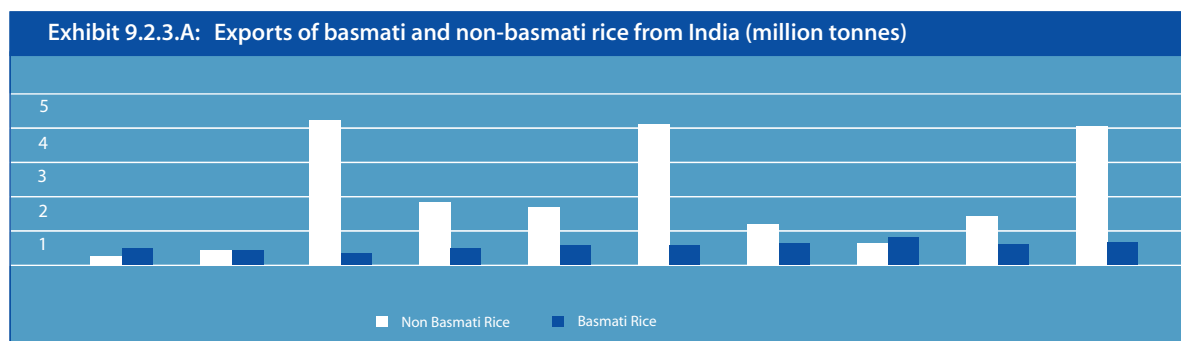
9.2.3 Basmati rice

India is the largest producer and exporter of Basmati rice in the world. Basmati rice is cultivated over about 0.7 - 0.8 million ha, which is about 1.6-1.9% of total area under rice. Basmati production is estimated at 1.2 million tonnes with an average yield of 1.5 to 1.8 tonnes/ha. The changes in area under basmati are dependent on the elasticity of demand and price offered in a particular season. At present, Haryana accounts for over 50% of total basmati rice production in India, Punjab accounts for 15% and the balance is cultivated in Uttaranchal and UP.

A large proportion of traditional Basmati varieties have been replaced by HYV like Pusa Basmati-1, Haryana-1, and Sugandh 1&2. Due to depletion of area under Basmati, several traditional varieties have been lost. Only a few varieties of traditional basmati are available, such as Basmati- 370 (earlier grown in Punjab), Tarawadi (Karnal local) and basmati Type-3 (earlier grown in and around Dehradun).

A. Exports

Rice has 11% share of total agricultural exports and 2% share of total exports from India. India exported about 0.6 million tonnes (INR 17.3 Bn) of Basmati rice and about 4 million tonnes (INR 36.3 Bn) of non basmati rice in 2002-03. Exports of non-basmati rice have displayed significant fluctuations across years, mainly on account of limited differentiation and value-addition.



Source - APEDA

Global rice exports are highly concentrated with six countries accounting for about 80% of the world's

exports. Of the 15-18 million tonnes of rice traded annually in the world market, Basmati Rice accounts for about 10%. The returns from basmati rice are 3x (USD 800-1200 per ton) those of non-basmati rice (USD 200-400 per ton).

The key export markets for Indian basmati are the Middle East, Europe and the United States. At present, the Middle East accounts for bulk of basmati exports because of the large South Asian expatriate population. India accounts for 65% of total basmati exports to the region (value USD 200 million). Europe is the second largest market for Indian basmati, with the United Kingdom being the largest buyer. The USA is a relatively small market for India.

Basmati 370 (Punjab basmati), Basmati 217 (Pakistan basmati), Karnal local (Tatoari basmati) and Type 3 (Deharadun basmati) have been recognized as typical basmati rice as these meet the norms for exports.

B. Quality issues

The quality requirements of rice vary across importers and destination markets. Small players account for a significant proportion of India's rice exports, some of whom do not adhere to the requisite quality requirements. This creates a negative perception, not only about specific players, but also about the country of source i.e. India. Therefore, it is essential that the Government via APEDA, undertakes necessary steps to educate exporters and ensures compliance with norms.

9.3 Government policy

9.3.1 Minimum support price

The Government announces Minimum Support Prices (MSP) for 24 major crops including several grains such as Paddy, Wheat, Jowar, Bajra, Maize and Ragi

Exhibit 9.3.1.A: MSP of key cereals (INR/quintal)							
	1997-98	1998-99	1999-2K	2000-01	2001-02	2002-03	2003-04
Kharif crops							
Paddy (Common)	415	440	490	510	530	550*	550
Paddy (Grade A)	445	470	520	540	560	580*	580
Jawar/Maize/Ragi	360	390	415	445	485	490**	505
Bajra	360	390	415	445	485	495***	505
Arhar (Tur)	900	960	1105	1200	1320	1325**	1360
Moong/Urad	900	960	1105	1200	1320	1335**	1370
Rabi crop							
Wheat	510	550	580	610	620	630**	630
Barley	350	385	430	500	500	505**	525
Gram	815	895	1015	110	1200	1225**	1400
Masur (lentil)	-	-	-	1200	1300	1325**	1500

Source: Ministry of Agriculture, Govt. of India

With the objective of keeping food subsidy under control and to encourage crop diversification, the Government for the first time in several years, decided to hold the minimum support price of wheat for the year 2003-04.

Since farmers are offered the same price (MSP in the case of Wheat and Rice) for their produce on the basis of fair average quality, high yield is the predominant parameter considered by the grower for taking up cultivation of a particular variety. This often leads to unavailability of the quality of produce which is suitable for processing.

Given that domestic wheat and rice prices are governed by the MSP announced by the Government, there is no correlation between domestic and international prices. This limits the export potential for Indian processors without subsidy.

9.3.2. Grain procurement / public distribution scheme

The government, as per the Budget for 2004-05, plans to expand the highly subsidized grain distribution program for the "poorest-of-the-poor" (Antyodaya Anna Yojana) to cover an additional 5 million families. When implemented, the scheme would result in a higher wheat offtake from government stocks and support higher consumption.

The selling price of wheat by the government under various Public Distribution Schemes (PDS) are: INR 6100/tonne for the Above Poverty Line (APL) consumers, INR 4150/tonne for the Below Poverty Line (BPL) consumers, and INR 2,000/tonne for the "poorest-of-the-poor" consumers.

The current mechanism of PDS, together with the huge differential between the selling prices of PDS grain and MSP, have translated into a burgeoning parallel market for grains, wherein substantial volumes targeted for PDS, get diverted via middlemen to chakkis/flour mills.

Exhibit 9.3.2: Economic cost of rice and wheat (INR/Quintal)						
	1999-00	2000-01	2001-02 (P)	2002-03 (P)	2002-03 RE)	2004-05 (BE)
Rice						
A. Acquisition Cost	887.30	1014.04	1052.66	1015.18	1045.58	1069.60
(i) Pooled cost of grain	831.34	930.41	961.16	944.27	970.68	993.23
(ii) Procurement incidentals	56.06	83.63	91.50	70.91	74.90	76.37
B. Distribution Cost	187.50	166.43	151.61	168.49	207.46	192.91
Economic Cost (A+B)	1074.80	1180.47	1195.55	1183.67	1253.04	1262.51
Wheat						
A. Acquisition Cost	685.51	716.60	739.13	754.55	778.04	784.54
(i) Pooled cost of grain	518.08	518.08	571.93	601.33	621.74	627.78
(ii) Procurement incidentals	117.06	135.94	167.20	153.22	156.30	156.76
(iii) Carry over charges to State Governments	50.37	-	-	-		
B. Distribution Cost	202.00	141.66	132.17	160.16	174.47	140.28
Economic Cost (A+B)	887.51	858.26	859.20	914.71	952.51	924.82

Source: Economic Survey, Govt. of India 2003-2004

A study by the Indian Statistical Institute estimated both the extent of leakage as well as the economic inefficiency of the public food-procurement system relative to the open market. The study highlighted that only 56 to 58.5 per cent of the total food subsidy (i.e., Center and State) reaches PDS consumers. Leakages account for around 15 to 28 per cent of the subsidy while the inefficiency of the government procurement and distribution system (FCI plus state level) relative to the market, leads to a loss of 16 to 26.5 per cent of subsidy.

9.3.3 Grain storage

Most storage godowns with FCI are small-scale, low-quality structures. Grains are also stored in the open (known as covered and plinth storage-CAP) leading to heavy storage-losses. A World Bank report (June 2000) states that half of FCI's grain stock is at least two years old, 30 per cent between two and four years old, and some grain stocks are as old as 16 years.

9.3.4. Buffer stocks

In addition to the requirements of wheat and rice under the Targeted Public Distribution System (TPDS), the Central Pool is required to have sufficient stocks in order to ride over situations like drought/failure of crops, and undertake open market sale in case of a sharp increase in market prices. The minimum buffer norms as well as actual stocks in the Central Pool at the beginning of four quarters for 2001-2004 (April) are provided in Exhibit 9.3.4. Buffer stocks have to reconcile the conflicting requirement of ensuring adequate availability with the need to minimise wastage, storage costs and interest on credit availed for food procurement and storage.

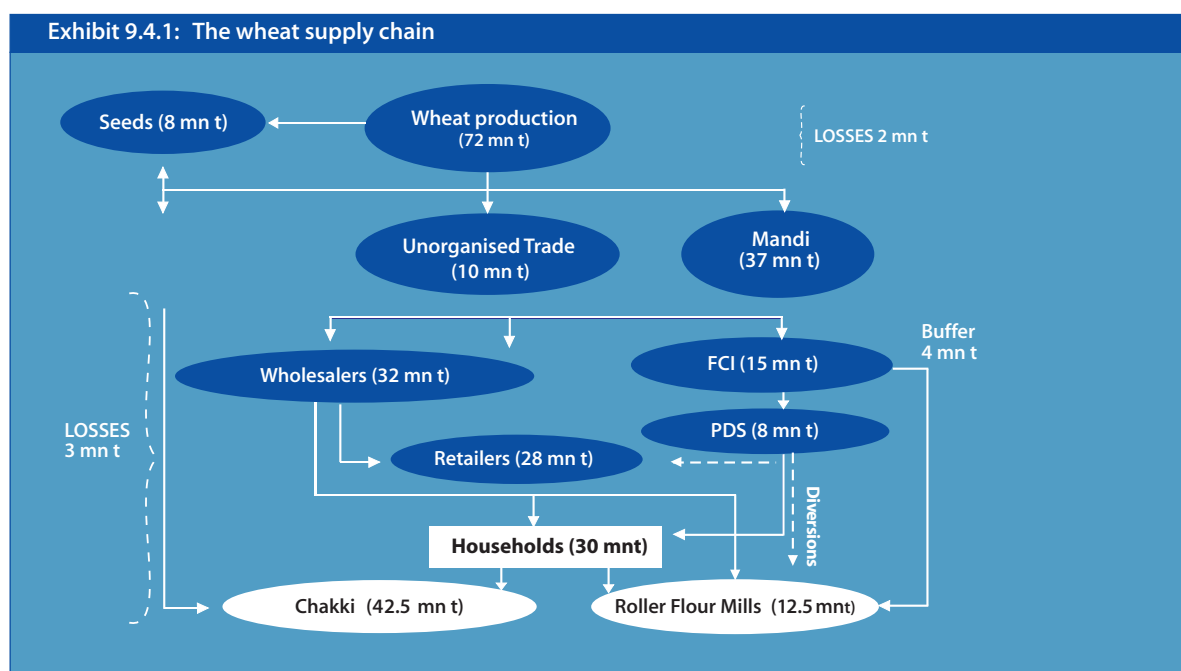
Exhibit 9.3.4: Central food grain stocks and minimum buffer stock norms (Million tonnes)						
Beginning of the month	Wheat Minimum	Actual	Rice Minimum norm	Total (Wheat + Rice)		
				Actual Stock	Minimum norm	Actual stock
Jan 2001	8.4	25.0	8.4	20.7	16.8	45.7
Apr 2001	4.0	21.5	11.8	23.2	15.8	44.7
July 2001	14.3	38.9	10.0	22.8	24.3	61.7
Oct 2001	111.6	36.8	6.5	21.5	18.1	58.3
Jan 2002 (P)	8.4	32.4	8.4	25.6	16.8	58.0
Apr 2002	4.0	26.0	11.8	24.9	15.8	50.9
July 2002	14.3	41.1	10.0	21.9	24.3	63.0
Oct 2002	111.6	35.6	6.5	15.8	18.1	51.4
Jan 2003 (P)	8.4	28.8	8.4	19.4	16.8	48.2
Apr 2003	4.0	15.6	11.8	17.2	15.8	32.8
July 2003	14.3	24.2	10.0	11.0	24.3	35.2
Oct 2003	111.6	18.4	6.5	5.2	18.1	23.6
Jan 2004 (P)	8.4	12.7	8.4	11.7	16.8	24.4
Apr 2004	4.0	6.9	11.8	13.1	15.8	20.0

(P) Provisional

Source: Department of Food and Public Distribution, Government of India

A possible solution to addressing the subsidy burden would be to limit the volume of wheat and rice purchases. Instead of open-ended procurement, only the requisite quantity for buffer stock and public distribution, should be purchased. Instead of being the first and often the only buyer, Food Corporation of India should be the buyer of last resort.

9.4 Grain infrastructure



Source : Industry, Rabobank research

A. Issues in grain infrastructure

- Sub optimal Post-Harvest handling and storage
There is negligible on-farm cleaning with no permanent storage structures available at the field level. The grain is handled manually. The addition of impurities and moisture levels translate into higher losses along the chain. The grading is done visually with negligible focus on identity preservation. The storage (typically in the open) is sub optimal.
- Mandi related issues
Under the APMC Acts of various states, it is mandatory for processors to procure grains only from a network of state-controlled 'regulated' wholesale markets. This is an inefficient process, as there are not only redundant transportation, loading and unloading costs, but also transaction costs through intermediaries who add negligible value to the produce. Further, there is a marketing fee levy associated with mandi

transactions which ranges from 0.5 to 2.5% across states.

Since most mandis do not have the infrastructure to effect appropriate grading and sorting of produce, the processor is forced to procure grain which is often a mix of different varieties and qualities.

High MSP apart, interest costs on storage, highly centralized system of procurement and distribution, and operational inefficiencies have been adversely affecting the economic cost of foodgrains to FCI.

Case study - Australia

There is no price or income support mechanism used for any grain in Australia. The government- both state and federal, is not involved in the marketing of Australian grains. Federal government involvement in the

grains industry is limited to regulation through an authority, the Wheat Export Authority (WEA), a national organisation, funded by the wheat industry through a levy. The WEA oversees the operation of the single desk and monitors returns to growers. The WEA was set up to control the export of wheat, after the transfer of the Government's role in marketing and sale of wheat, to a private company controlled by wheat growing shareholders (AWB Limited). The WEA operates independently from AWB Limited and its subsidiaries.

The WEA operates under the Wheat Marketing Act 1989 (the Act) and has the following statutory functions:

- to control the export of wheat from Australia; and
- to monitor AWB(l)'s performance in relation to the export of wheat and to examine and report the benefits to growers of that performance.
- to cooperate with and assist the independent review panel reporting on AWB(l)'s performance in the operation of Australia's wheat export arrangements, and the WEA's performance in carrying out its legislated functions.

The WEA considers wheat export applications against a set of Guidelines. The Act entitles AWB(l) to special wheat exporting privileges. AWB(l) does not need to apply to the WEA for consent to export wheat. All other wheat exporters must apply for written consent from the WEA. Exports of wheat in bulk, containers or bags by exporters other than AWB(l), are subject to WEA approval following consultation with AWB(l). The WEA must have AWB(l)'s written agreement before issuing a consent to export wheat in bulk. The WEA works closely with the Australian Customs Service and the Australian Quarantine and Inspection Service (AQIS) to promote export compliance. Under the Act, an individual can be fined USD 60,000 and a company USD 300,000 for non compliance.

Currently, the following single desk rights exist for the export of various grains from various states:

- The AWB Ltd (publicly listed) has single desk rights for the export of wheat from Australia

- GrainCorp Ltd (publicly listed) has sole vesting rights for sorghum, barley and canola from New South Wales (NSW).
- CBH(GPWA) Ltd (grower cooperative) has sole vesting rights for canola, lupins and barley from Western Australia
- ABB Grain Ltd (publicly listed) has sole vesting rights for barley from South Australia
- Ricegrowers Cooperative Ltd (Sunrice) (grower cooperative) has sole vesting right for rice from NSW

Single desk and or vesting rights were historically granted, by governments, to state grain marketing boards. Over time (particularly through the 80s and 90s) these state marketing boards became private companies/cooperative with grower shareholders. There are no income support payments for the grain industry in Australia. Buffer stocks etc are not maintained by the Australian government. Storage and handling facilities are owned and managed by companies which are either publicly listed or are farmer owned cooperatives.

9.5 Wheat based processed foods

Bread, Biscuits and Grain Based snacks are the key grain based processed foods sectors in India.

Exhibit 9.5: Market size for various segment of grain based foods		
	Value (INR Billion)	Volume (Million tonnes)
Bread	38.9	3.75
Biscuits	68.6	1.95
Grain based snacks	29.0	0.29
Branded Atta	13.5	0.90
Pasta products	8.4	0.14
TOTAL	158.4	7.03

Source: Industry Estimates

9.5.1 Atta (Whole meal flour)

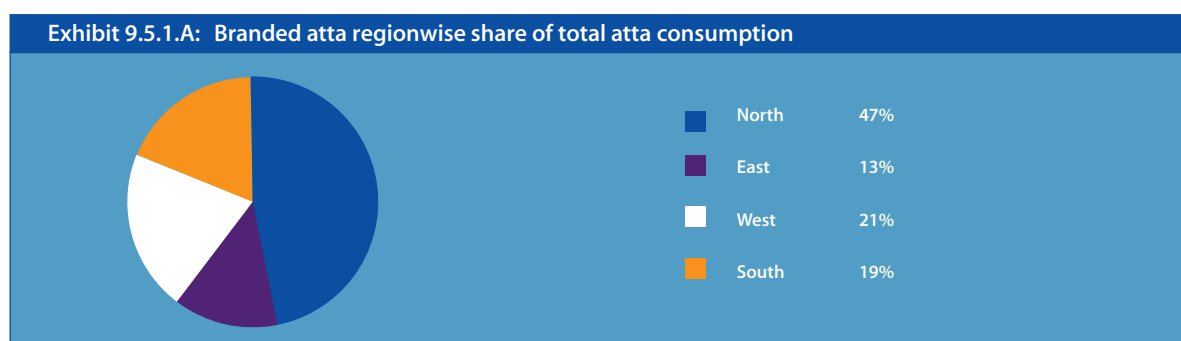
According to estimates, more than 65% of total wheat produced in the country is utilized for atta production, which in turn is used for the preparation of Chapatis.

As per industry sources, the branded atta market stands at about 0.9 million tones. Branded atta is a relatively new segment, developed on the back of the opportunity to provide consumers a more hygienic product of consistent quality, as compared to chakki atta. The branded segment is currently growing at 7-9 per cent,

which is lower than initial expectations of players who have entered this segment. Key reasons are as below :

- the increase in the price level of branded atta as compared to chakki atta, due to taxes and distribution margins
- Lack of well-differentiated value proposition for consumers.

Diversion of PDS grain via the grey market, also translates into lower cost of raw material for small, unorganized players, who are therefore able to price their product more competitively. Moreover, the players in the unorganized sector do not pay sales tax and are able to offer the product at a lower price to the consumer.



Source Rabobank research

North - The wheat is sourced mainly from Punjab and UP. Most companies are incurring losses in North India, as it is difficult to justify a premium over chakki atta.

East - The market is mainly serviced by mills in Eastern UP

South and West - Profitability is higher (INR 1.5 per kg) due to less competition from chakkis (as is the case in North India). Although raw material cost of wheat is higher, it is offset by higher MRP.

Exhibit 9.5.1.B: Branded atta cost card (INR / Kg)

	North	East	West	South
MRP of 1 kg Branded Atta	12.00	15.00	20.00	20.00
Retailer's Margin	0.89	1.11	1.48	1.48
Distributor's Margin	0.53	0.66	0.88	0.88
Sales Tax (4%)	0.41	0.51	0.68	0.68
Gross Realisation per kg	10.18	12.72	16.96	16.96
Discount / Scheme	1.53	1.53	2.54	2.04
Discount / Scheme %	15.00%	12.00%	15.00%	12.00%
Net Realisation (NR) per kg	8.65	11.19	14.41	14.92
Raw Material	8.00	8.00	10.00	10.00
Packing Material	0.75	0.75	0.75	0.75
Mfg Variable Cost	0.75	0.75	0.75	0.75
Transportation	0.25	1.00	1.00	2.00
End-to-End Contribution	-1.10	0.69	1.91	1.42
(%on NR)	-13%	6%	13%	10%

Source: Rabobank research

9.5.2. Bakery products

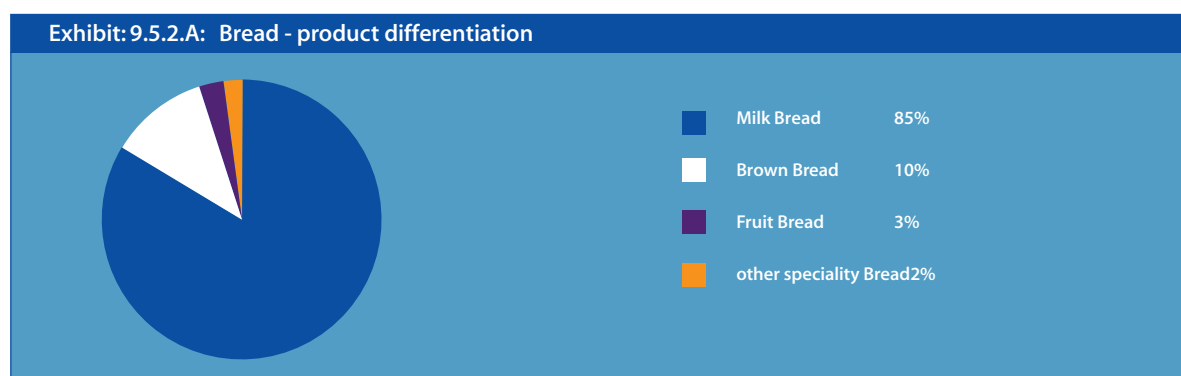
Bakery products constitute the largest segment of grain-based processed foods. The industry is characterized by the presence of a large number of unorganized players, exceeding 50,000. There are only about 15 players, who market branded, packed bakery products.

A. Bread:

Total bread production in the country is estimated to be 3.75 Million tonnes annually. As per industry estimates, in the last 5 years, the bread industry in India has been growing at about 6%. The organized segment has grown faster at 8%. In 1977, the Government of India had reserved the bread industry for small scale industries (SSI). The then existing two large units viz., Britannia Industries Limited and Modern Food Industries Ltd. were however allowed to continue on the basis of their respective existing installed capacity. Besides these two players, there are 25 medium-scale and 1800 small-scale manufacturers, and together, account for 45% of production. The unorganised sector is estimated to have as many as 75,000 bread bakers located in residential areas in towns and cities. According to industry sources, South India consumes 32 per cent of the bread produced in the country, followed by the North at 27 per cent, the West at 23 per cent and the East being the remainder.

From being a low priced commodity, bread has gradually developed into a branded product largely because of the product positioning platforms created by the two large players in the industry.

The bread industry is expected to register rapid growth driven by consumers' need for convenient food options for breakfast as well as increased propensity to 'snack'. While consumption of 'milk bread' continues to dominate, segments such as brown bread and fruit bread has been growing rapidly in the recent past. Growth of the food service industry is also expected to catapult the growth of bread and bread-based foods such as burgers, sandwiches and pizzas, the key food offerings of most food outlets.



Source: Industry Estimates

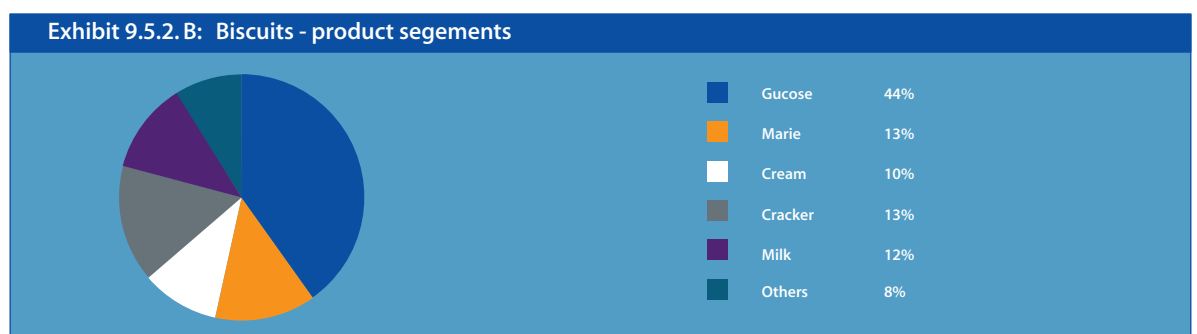
Most bakeries in India produce bread or biscuits of a single variety; such as white pan bread and sweet glucose biscuits respectively. A variety of products can be made by changing the shape, recipe, and by incorporating other ingredients or processing conditions. In countries such as West Germany as many as 200 varieties of breads are made, both in large and small scale bakeries. The use of technology has made it possible to offer differentiated products.

B. Biscuits:

The size of the biscuit industry is estimated to be around 1.95 million tonnes (valued at INR 68.6 Bn), of which the organized (branded/packed) segment is about 57% by volume, but 64% by value. The organised biscuit sector comprises two large scale units, about 50 medium scale and approximately 2500 SSI Units. The unorganised sector is estimated to have approximately 30,000 small and tiny bakeries across the country. The biscuit industry, which was till then reserved for the SSI sector, was dereserved in 1997-98. Post-dereservation the biscuit industry grew by 10-12% upto 1999-00. Subsequent to dereservation, many other SSI units have joined as franchisees of large biscuit manufacturers.

The per capita consumption of biscuits is only 1.9 Kg., compared to 10 Kg in the USA, UK and West European countries and above 4.2 Kg in the South East Asian countries, i.e. Singapore, Hong Kong, Thailand, Indonesia etc. While product differentiation through convenient packaging, (smaller packs at affordable price points), aggressive promotion and distribution have been the key growth drivers of branded biscuits on the supply-side, growing income levels and increased consumer spending on high value food items have driven demand.

Biscuits are still dominated by basic biscuit categories such as Glucose and Marie which 'aim to satisfy hunger'. Product innovation and variation to bring in differentiated products (such as 'Little Hearts', 'Pure magic' and 'Good-day' brands of Britannia and 'Hide and seek' brand of Parle) has resulted in increased sales and superior price to manufacturers. There is further scope to segment the market through innovative value propositions in taste, need and image, such as 'snacking' and 'indulgence'.



Source: Industry Estimates

The major deterrent affecting the growth of the biscuit industry is taxation. Central Excise Duty on biscuits is 8%. There has been a sharp increase in growth with the lowering of Excise duty from 16% to 8% as seen in Exhibit 9.5.2 C. In addition to the Excise duty, there are various State Taxes such as Sales Tax, and other local levies Turnover Tax, Local Area Tax, Octroi, Purchase Tax Mandi Tax etc. **There should be zero sales tax and excise duties on biscuits to encourage consumption.**

Exhibit 9.5.2.C: Impact of excise duty on biscuit growth rates		
1998-99	8%	11%
1999-00	8%	11%
2000-01	16%	-3.5%
2001-02	16%	2.75%
2002-03	16%	3%
2003-04	8%	15%
2004-05	8%	18% *

* Estimated

Source - Federation of Biscuit Manufacturers Association of India

9.5.3 Grain based snacks

The total grain based snack food market, comprising extruded western snacks (excluding chips) and namkeen is estimated at around 0.29 Million tonnes (INR 29 Billion in value terms). The organized segment has a 15% share of the market.

Exhibit 9.5.3.A: The composition of the snack food market						
	Unorganized Tonnes	% share of total	Organized Tonnes	% share of total	Total Tonnes	% share of total
TOTAL MARKET	2,45,000	100	42,000	100	2,87,000	100
Extruded snacks	14,000	6	9,000	21	23,100	8
Namkeen	2,31,000	94	33,000	79	2,64,000	92

Source: Rabobank research

In the organized / branded segment, ethnic snacks dominate with about 80% of the volumes. The balance is contributed by extruded western snacks. As per industry sources, sales tax and excise duties account for almost 20% of the MRP of these products in the organized sector (Refer Exhibit 9.5.3B). There should be zero sales tax and excise duties to catalyse growth of these segments.

Exhibit 9.5.3.B: Typical cost card for grain based snacks (Organized sector)		
	MRP per pack of 35 gms (INR)	% of MRP
	10	100%
Retailer's Margin + discount	0.83	8%
Distributor's Margin	0.44	4%
Sales Tax #	0.94	9%
Excise Duty	1.04	10%
Net realization	6.76	68%
Raw Material + Packaging + Manufacturing	3.85	39%
Distribution	0.41	4%
Returns	0.27	3%
Gross Realization	2.23	22%

Source: Industry, Rabobank Research

Varies across states (assumed at 12% for this calculation)

9.6 Vision, Strategy and action plan

Grain-based products are envisioned to grow from the current size of INR 1466 bn to INR 2090 bn in 2010 and INR 3092 bn in 2015.

Exhibit 9.6.A: Market potential											
	Current Volume (Million Tonnes)	Average Price (INR /Ton)	Current value (INR Million)	Current Growth (%)	Value additional per annum	Volume 2010 (Million Tonnes)	Volume 2010 (INR Million)	Volume 2015 (Million Tonnes)	Volume 2015 (INR Million)	Growth Rate (2005-10)	Growth Rate (2010-15)
Rice Milling-Modern Rice Mills	20	14000	28000	3%		30.07	421016	40.24	563415	6%	6%
Capacity Utilization (%)											
Rice Milling-Unorganised	65	8000	52000	1%		69.69	557510	73.24	584949	1%	1%
Capacity Utilization%			80000				978527		1149364		
Flour milling											
Organised	12.5	11000	137500	3%		18.80	206749	25.15	276677	6%	6%
Capacity Utilization (organised) (%)											
Unorganised	42.5	9000	382500	2%		48.82	439372	53.90	485102	2%	2%
Capacity utilization (unorganised)(%)											
			520000				646121		761780		
Processed Grain products											
- Bread - organised	1.69	12000	20280	8%	8%	3.29	67730	5.30	160275	10%	10%
Capacity utilization (organise)											
- Bread - organised	2.06	9000	18540	6%		3.10	27877	4.15	37306	6%	6%
Capacity utilization (organise)											
			38820				95608		197581		
Biscuits - organised	1.10	40000	44000	6%	8%	2.14	146949	3.45	37736	10%	10%
Capacity utilization (organise)%											
Biscuits - organised	0.85	30000	25500	5%		1.20	35881	1.53	45794	5%	5%
Capacity utilization (organise)%											
Snack foods	0.29	100000	29000	10%	10%	0.77	150325	1.55	486950	15%	15%
Capacity utilizatio (%)											
Pasta based foods	0.14	60000	8400	9%	10%	0.31	36187	0.55	102709	12%	12%
Capacity utilizatio (%)											
Grains - organised	36		519180			55	1028958	76	1937762	6%	7%
Grains - unorganised	110		946540			123	1060641	133	1154152	2%	3%
Grains - Total	146		1465720			178	2089599	209	3091914	3%	3%

The estimated investment is INR 124 bn till 2015 (INR 62 bn till 2010 and INR 62 bn between 2010 and 2015)

Exhibit 9.6 B: Estimated investment in the grains sector

	Current capacity (Tones/day) & Utilization (%)	New capacity required (2005-01) Tonnes/day	New capacity required (2010 - 15) Tonnes/day	Investment (2005-10) (INR Million)	Investment (2010-15) INR Million	Total Investment (2005- 15) (INR Million)
RiceMilling - Modern Rice Mills	95238	30064	23749	24052	18999	43051
Capacity Utilization (%)	70	80%	90%			
Flour milling						
Organised	92593	21319	25824	14923	18077	33000
Capacity Utilisation (organised) (%)	45%	55%	60%			
Processed Grain products						
- Bread - organised	9389	6294	6417	4720	4813	9533
Capacity utilisation (organised)%	60%	70%	80%			
Biscuits - organised	6111	4096	4177	12289	12531	24820
	60%	70%	80%			
Snack foods	1611	2062	2792	4743	6421	11164
Capacity utilisation (%)	60%	70%	80%			
Pasta based foods	667	709	897	1418	1794	3212
Capacity utilisation (%)	70%	75%	80%	62145	62635	124780

The strategy and action plan is as follows:

9.6.1 Government procurement

Restrict Government procurement

In view of India's current level of production of wheat and rice, as well as to encourage participation of private sector players in grains, it is recommended that Government procurement be restricted to requirements for buffer stock as well as for public distribution schemes only.

Direct income support to farmers

The Minimum Support Price (MSP) system in foodgrains creates significant distortions to free market forces, while draining Government resources. Given the steady increase in MSP every year, as against wide fluctuations in global prices of wheat and rice, India is not competitive in wheat exports. However removal of MSP, apart from being politically difficult, may cause an undesirable dip in the production of foodgrains in India

Direct income support to the farmer can be an effective solution for the farmer and the Government. This support can be implemented through Kisan Credit Cards (KCC) whereby the subsidy can be credited directly to the farmer's account.

Exhibit 9.6.1.A: broad estimate of the subsidy burden in the proposed system is provided below.

	Wheat	Paddy
Target price* (INR/kg) 'A'	6	5.5
Actual market price (INR/kg) 'B'	5	5
Total production (mn MT) 'C'	73	90
Subsidy (INR bn) ((A-B)*C)	73	45
Total subsidy* (INR bn)	118	

* - As announced by the Government

- This system would have several benefits, such as:
- It would benefit farmers in all wheat/rice producing states, as against a few states at present.
- The funds will flow directly into the farmer's bank account. The proposed system would thus promote the use of organized sources of financing.
- It would lower the economic cost involved in FCI's procurement and storage of grains.
- Under the new system, the private sector would enjoy higher freedom to trade in foodgrains and this would encourage creation of infrastructure by the private sector.
- India will be more competitive in export of food grains.

9.6.2 Improving the mandi procurement set-up



Compulsory buying of grains at the mandis leads to high raw material prices (and other related costs such as statutory charges, transportation from mandi to manufacturing unit etc) for processors. There are no means of hedging market risks. In order to ensure a more effective linkage between farmers and processors, and to reduce the inefficiencies related with produce routed through the mandi, the existing APMC acts enforced by the state governments need to be amended, to foster direct processor farmer linkages

Farmers should have a choice whether to sell via the mandi or directly to processors, which is determined on the basis of convenience and expected returns from these alternate channels. Direct interface between the processor and farmer should be encouraged to provide credit, agri-inputs and extension services. The farmer will also benefit on account of higher net realisation as well as access to credit, inputs and best practices in crop management.

Standardized grading at mandis - Identity preservation is key to reward farmers for quality output. A standardized grading and storing system needs to be implemented by the Government as this would also be an important measure for India to establish a firm foothold in the export markets. Further, Identity Preservation will gain importance on the global platform, in the context of Genetically Modified Crops.

9.6.3 Grain handling infrastructure

Exhibit 9.6.3.A: All India storage capacity (Owned & hired/covered and CAP), stocks held and capacity utilisation (As of February 2003)											
(Fig. in ' 000 Tonnes)											
ALL INDIA	Covered					Total Hired	Total Covered	CAP (Open)			Grand Total
	FCI Owned	State Govt.	C.W.C.	S.W.C.	Private			Owned	Hired	Total	
Capacity	12818	1305	2165	7431	3121	14022	26840	2346	3200	5546	32386
Stocks	7122	1018	1850	6025	2305	11199	18321	421	1188	1608	19929
Utilisation	56%	78%	85%	81%	74%	80%	68%	18%	37%	29%	62%

Source: Rabobank Research

The Government needs to develop new infrastructure for storage and transportation of grains. In addition, the existing infrastructure needs to be upgraded. There is a need to create/promote farm-level godowns for storage of produce. As per industry sources, the total cost of a 5000 tonne warehouse is estimated at INR 8 Million (This includes land and development cost of INR 0.4 million and a civil cost of INR 7.6 Million).

In this context the warehouse receipt mechanism for financing will be a powerful tool to enable farmers to utilize these facilities. The Government's role to facilitate Warehouse Receipt Financing would be to allocate warehouse space for storage by small farmers, appoint a suitable agency to undertake transaction documentation for a fee to be paid by the bank, provide requisite legal and policy framework for warehouse receipt financing, promote state-level certification through accredited agencies and facilitate insurance. The same has been discussed in detail in Chapter 5 Volume 1 Financing for Food Processing Companies.

9.6.4 Changes required in the tax/regulatory regime

- Removal of all indirect taxes (Centre as well as State) across the supply chain for grain and grain based products
- Government via APEDA should undertake necessary steps to educate Basmati rice exporters and ensure compliance with quality norms
- Essential Commodities Act (ECA) leads to several hindrances including easy inter-state movement of food grains and essential food items. In March 1993, the central government announced its policy to treat the entire country as a single food zone. However, there is ambiguity with respect to the government policies as State Governments continue to impose restrictions on movement and storage of agricultural produce. Moreover, the ECA has also lost its relevance in an era of surplus food grains.
- A standardized grading and storing system needs to be implemented by the Central Government as this would also be an important measure for India to establish a firm foothold in the export markets. Further, Identity Preservation will assume increased importance on the global platform, in the context of Genetically Modified Crops. Currently the nomenclature for commodities is based on physical / geographical considerations. There has to shift to a system based on quality specifications.

9.6.5 Summary of action plan on grains

Central Government	<ul style="list-style-type: none"> λ Zero excise taxes on grain-based foods λ Discontinue open-ended procurement of food grains. Instead of open-ended procurement, only the requisite quantity for buffer stock and public distribution should be purchased. λ Financing of storage facilities at farm level. λ Standardized grading system to be formulated and implemented λ Government via APEDA should undertake necessary steps to educate Basmati rice exporters and ensure compliance with quality norms λ MSP system of procurement to be replaced with Income support system routed through Kisan Credit Cards λ Step up per hectare productivity of durum wheat grown under residual moisture increase adoption of requisite moisture conservation steps, appropriate genotypes, use of sprinkler irrigation etc λ Promote warehouse-receipt based financing to enable farmers to store grain
State Government	<ul style="list-style-type: none"> λ Modify APMC Acts (according to Model law) to allow sale of grains from farmers to private players λ No indirect taxes on grains and grain based foods λ The states should remove restrictions on the storage and movement of food grains.

Appendix 1

Share of processing in the F&V sect

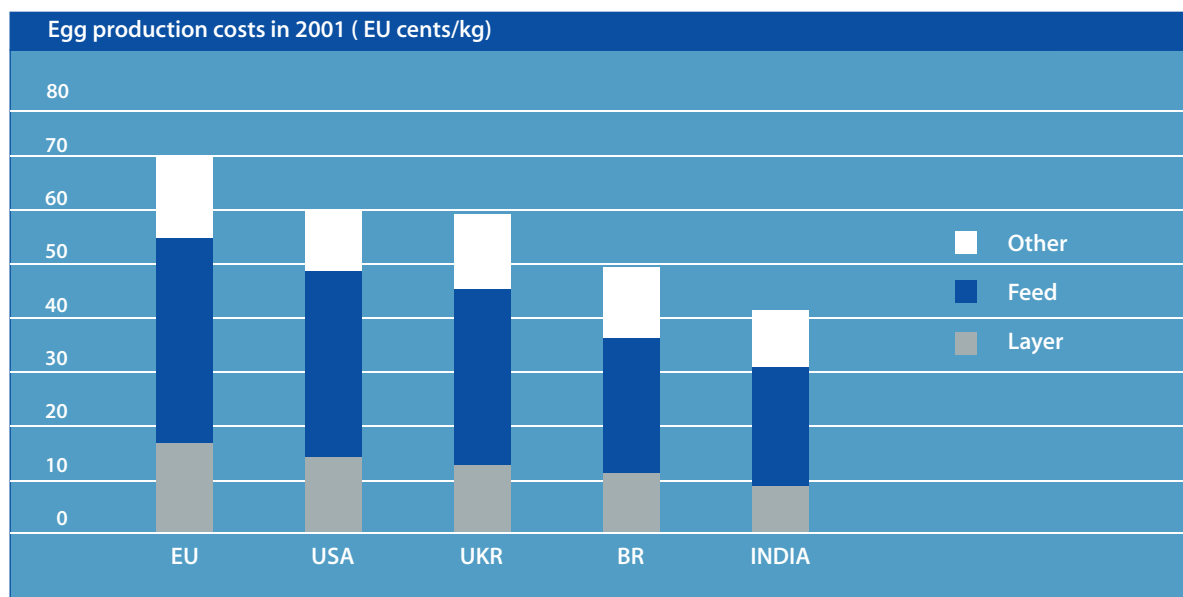
	Value	Volume	
	(INR Billion)	('000 tonnes)	Remarks
Processed	37.5	850	Average Realization of INR 50 per kg of processed in organized and INR 40 per kg in unorganized sector
Fresh Packed	12	1000	Source APEDA
TOTAL	47.6	1850	
Total quantity of F&V processed		2700	
Total quantity of F&V produced		129000	Fruits + Vegetable production in India
Share of processing		2.1%	

Appendix 2

Egg Powder Industry in India

The egg powder industry is estimated at INR 2 billion (USD 45 million) with 4 active players. The total capacity of the industry is approximately 10,000 MT (excluding the non-operative manufacturing units) of whole egg powder per annum of which the capacity utilization averages between 70-80%.

All the plants are 100% EOUs and manufacture Whole Egg powder, Egg Yolk & Egg White Powder.



Source: LEI

The key export markets for Indian egg powder are EU and Japan which account for 56% and 22% of Indian exports respectively.

Indian egg powder has significant growth potential given the country's cost competitiveness in this area (see exhibit below)

The industry is growing rapidly at a rate of about 10% per annum.

Key issues

1. EU export subsidies and EU import tariffs

EU subsidizes its egg powder exports, wherein the subsidy level depends on the actual market prices (the subsidy increases during a low market price regime and vice versa). The subsidy has increased to levels of 1.2 Euro / kg (over 30% of product price). This impacts Indian competitiveness in markets such as Japan, where it competes with the EU.

Further, EU imports of egg powder are covered by a Tariff Rate Quota (TRQ).

2. Residue monitoring

As per the stringent norms on residue levels permitted by EU, India needs to comply with 2 requirements:

- Pre-shipment testing of all orders as per the specification of importer / importing country. These tests are done at the importing country as per their analytical methods. The cost of these tests is quite steep at Euro 250 per sample.
- Residue monitoring by India's Export Inspection Council (EIC) - which requires collection of samples, and reporting on conformance to EU norms on an annual basis. EIC has authorized APEDA to conduct these tests. APEDA collects samples from all exporters, on a regular basis, which are tested at Government accredited laboratories. The cost of this monitoring was borne by the Government till 2002-03. However in 2003-04, this cost was shared equally by the industry. This cost of monitoring is very high, and given that this is a requirement of the Government, should continue to be borne 100% by the Government.

Other measures which can boost the industry's prospects

Currently the industry is completely dependent on exports. The industry needs to develop a domestic market especially the institutional market. The Government can make the product more affordable by exempting it from excise duty.