MOFPI

Ministry of Food Processing Industries

Government of India

Assessment Studies For Identifying Gaps in Infrastructure & Processing Facilities for Development of Potential Value Chains for Perishable Products under Operation Greens Scheme

INDIA

Assam | Meghalaya | Tripura | West Bengal

Prepared by

TransGraph Consulting Pvt. Ltd

TRANSGRAPH

RESEARCH - CONSULTING - TECHNOLOGY

commodity market mentors

Contents

Focus Study Area 8
Executive Summary Sheet - Interventions 9
ASSAM 12
Summary and Flow of the Report 13
Approach & Methodology 15
Study Area 15
Stakeholder Consultation 16
Pineapple Production & Trade flow in Assam 18
Production in India 18
State wise Production 18
Assam 19
Pineapple Production in Assam 19
District Wise Production & Trade Flow 21
Infrastructural Assessment & Gaps 28
Producer 28
Primary Processor 29
Transportation & Logistical Service Provider 29
Kisan Rail 30
Trader/Aggregator 30
Processor 31
FPO/SHG/Cooperatives 32
Retailer 33
Other Interventions 33
Recommendations 34
Production 34
Primary Processing 34
Marketing 35
Processing 35
Credit Linkage 36
Summary of Recommendations 36
Context & Interventions 37
Interactions 42
Meeting with State Government Departments 42

Shri. Triranga B. Borah, Director, Department of Horticulture & Food Processing, Assam 42
Shri Bharat Rajbonshi (District Agriculture Officer, Kamrup) 42
Mr. Purna Basumatary District Agriculture Officer at Karbi Anglong West district (headquarter Hamren city) 42
Mr. Bidu Raijung, District Agriculture Officer at Karbi Anglong East district 43
Mr. S.Thangeq, Assistant Horticulture Officer, Karbi Anglong East district 43
Mr. Raju Deka, Trainer (FPOs/SHGs/FPCs) 43
Mr. Pawan Boro, Assistant Horticulture Officer, Dima Hasao district 43
Mr. L. Tuolor, Deputy Director Horticulture 43
Mr. M.Terangpi, General Manager, District Industry Centre, Directorate of Micro, Small & Medium Enterprises, Assam 43
Meeting with Industry Anchor 44
Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India) 44
Schemes & Policies 45
Industrial & Investment Policy of Assam, 2019 45
The North East Industrial Development Scheme, 2017 47
The Export & Logistic Policy of Assam, 2019 48
WEST BENGAL 52
Summary and Flow of the Report 53
Approach & Methodology 54
Study Area 54
Stakeholder Consultation 55
Production in India 58
State wise Production 58
West Bengal 59
Pineapple Production in West Bengal 59
District Wise Production & Trade Flow 61
Infrastructural Assessment & Gaps 66
Producer/Farmer 66
Primary Processor 66
Trader/Aggregator/Exporter 66
Transportation and Logistical Service Provider 67
Kisan Rail 68
Processor 68

Case of Laxmi Fruit Processing, Lopchu Bazar, Darjeeling 69
Recommendations 71
Primary Processing 71
Marketing 71
Processing 72
Context & Interventions 72
Interactions 77
Meeting with State Government Departments 77
Shri. Jayanta Kumar Aikat, IAS, Commissioner, FPI&H Department, Director, Food Processing Industries and OSD &EO Director Horticulture 77
Mr. Debashis Roy, WBCS, Assistant Registrar of Co-operative Societies, Uttar Dinajpur 77
Mr. Sandepon Roy, Assistant Director of Agricultural Marketing, Administrative, Uttar Dinajpur 77
Mr. Sunil Chandra Sarkar, General Manager, District Industry Centre, Directorate of Micro, Small & Medium Enterprises, West Bengal 77
Mr. Sufal Mondal, District Horticulture Officer, Uttar Dinajpur 77
Mr. Satya Singh, District Horticulture Officer, Darjeeling 77
Mr. Uttam Bhowmik, Agri Marketing Officer (Training & Canning), Jalpaiguri 78
Mr. Suman Dutta, Field Consultant, Rajganj Block, Jalpaiguri Horticulture Department, Government of West Bengal 78
Meeting with Industry Anchor 78
Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India) 78
Schemes & Policies 79
West Bengal Incentive Scheme 2013 for Micro, Small and Medium Enterprises 79
Banglashree for Micro, Small and Medium Enterprises (MSMEs) 81
TRIPURA 86
Summary and Flow of the Report 87
Approach & Methodology 88
Study Area 88
Stakeholder Consultation 89
Pineapple Production & Trade flow in Tripura 91
Production in India 91
State wise Production 91
Tripura 92
Pineapple Production in Tripura 92

District Wise Production & Trade Flow 93
Infrastructural Assessment & Gaps 97
Producer 97
Primary Processing 97
Transportation & Logistical Service Provider 98
Kisan Rail 98
Trader/Aggregator 99
Secondary Processor 99
Recommendations 101
Production 101
Primary Processing 101
Marketing & Transportation 101
Processing 102
Context & Interventions 102
Interactions 107
Meeting with State Government Departments 107
Shri C.K Jamatia, Secretary and Dr. Phani Bhusan Jamatia, Director, Horticulture and Soil Conservation 107
Shri. Hirendra Debbarma, Deputy Director (Horticulture), North Tripura 108
Smt. Sangi, Superintendent of Horticulture, Kanchanpur (North Tripura) 108
Meeting with Industry Anchor 108
Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India) 108
Schemes & Policies 110
Tripura Industries (Facilitation) Act & Rules 110
Tripura Industrial Investment Promotion Incentive Scheme, 2017 110
MEGHALAYA 112
Summary and Flow of the Report 113
Approach & Methodology 114
Study Area 114
Pineapple Production & Trade flow in Meghalaya 115
Production in India 115
State wise Production 115
Meghalaya 116
Pineapple Production in Meghalaya 116

District Level Production 117
Infrastructure Assessment and Gaps 122
Production end 122
Post-Harvest 122
Processing 123
Present Status 123
Recommendations 124
Production end 124
Post-Harvest 124
Processing 125
Context & Interventions 125
Government Interactions 132
Iaskhembor Majaw, Assistant Director of Horticulture, Ri Bhoi 132
Mr Balawanmon Keri, Asst Director of Horticulture, Nongpoh 132
Nathaniel Shadap, Asst Director of Horticulture(Marketing), East Garo Hills 132
Shri Maxpemberton D Arengh, District Horticulture Officer, West Garo Hills 133
Siljang Sangma, District Horticulture Officer, East Garo Hills 133
Industry Mentor 133
Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India) 133
..... 135
Schemes 135
Integrated Technology Enabled Agriculture Management System Or iTEAMS 135
FRUIT PROCESSING CENTRE 135
Meghalaya Industrial & Investment Promotion Scheme, 2016 135
WASTE TO WEALTH 140
Waste to Wealth 141
Production of biofuels from fruit waste streams: 141
Production of juice: 141
Pineapple wine: 141
Production of animal feeds: 141
ANNEXURES 143
Annexures 144
Annexure 1: Product Profile – Pineapple 144
Varieties & Characteristics 144

Annexure 2: Global production, consumption; Indian Trade of Fresh and Processed Pineapple .. 145

Global Production of Pineapple 145

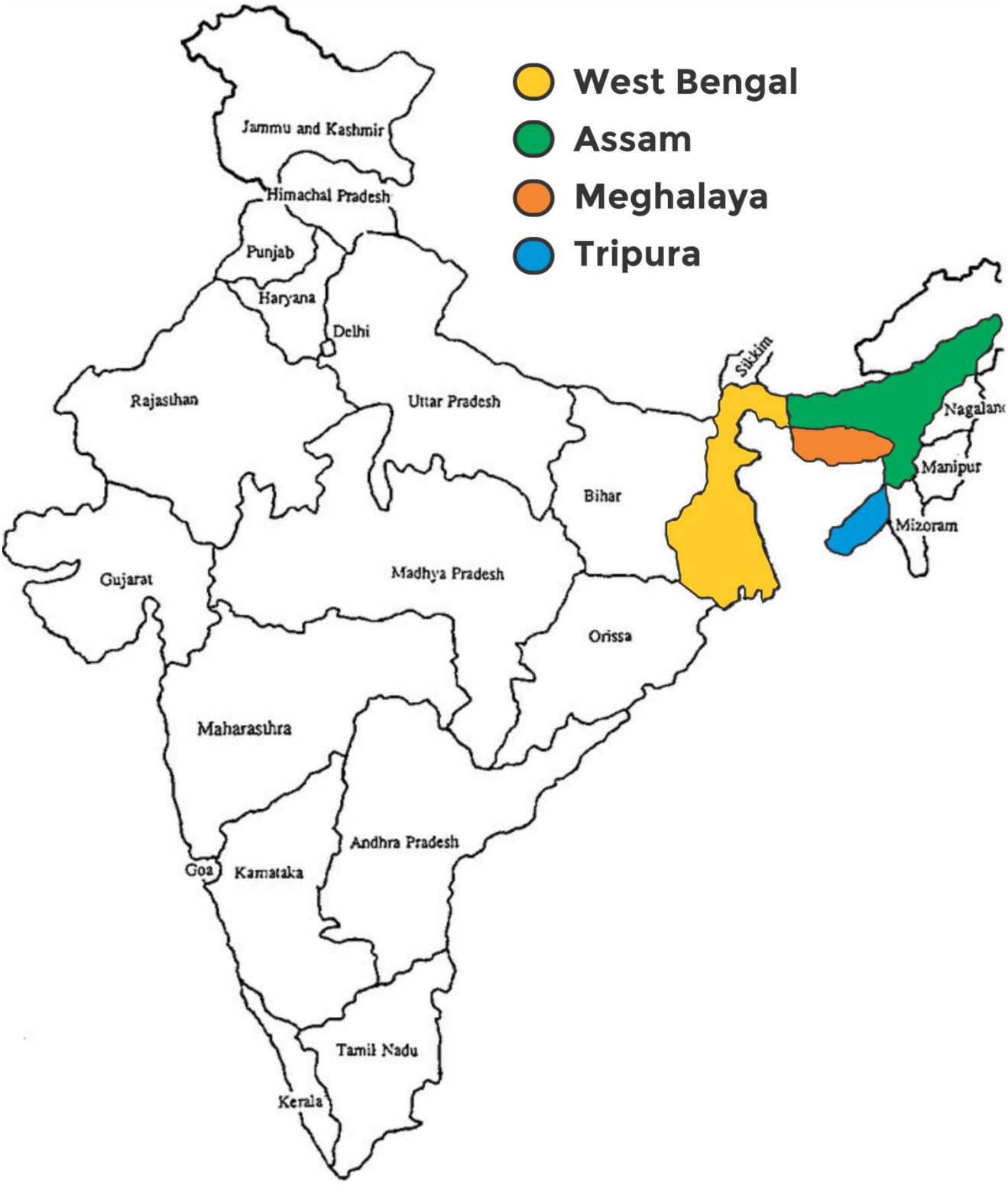
Global Consumption of Pineapple 145

Global Trade of Pineapple 146

Seasonality: 148

Indian Trade of Pineapple 148

Focus Study Area



Executive Summary Sheet - Interventions

Proposed Intervention Component	Clusters/States					No.s Proposed	Per Unit Cost	Total Investment	Mode of Implementation
	Assam	West Bengal	Tripura	Meghalaya			(in lakhs)	(in lakhs)	
	Kamrup, Dima Hasao, Karbi Anglong(East/West)	Darjeeling, Uttar Dinajpur, Jalpaiguri	North Tripura, Dhalai	Ri Bhoi	East Garo Hills, West Garo Hills	(A)	(B)	(A*B)	
APEDA certified Integrated Packhouse 1 TPD capacity	LT	LT	LT	NA	LT	10	50	500	Large Industries, HNI Individuals and Warehouses
Mobile Pre-cooling Units	ST	ST	ST	ST	ST	17	25	425	FPOs, Cooperatives and District Administration
Farm level sorting and grading facilities – 1MT/hr	ST	ST	ST	ST	ST	55	15	825	FPOs, Groups and Small Industries
Candied fruit production line – 1 TPD	NA	ST	NA	NA	NA	2	43	86	MSMEs, Institutional Investors, Large Industries

PET bottle packaging line – 500 LPH with Pre-processing section	NA	LT	NA	NA	NA	1	975	975	Large Industries
Juice Processing Plant – 500 LPH	NA	ST	NA	NA	NA	2	26	52	Individuals, MSMEs, Institutional Investors, Large Industries
Canning line for fruit pulp 2TPH	ST	NA	ST	ST	NA	6	67	402	MSMEs and Large Industries
Spray drier units	LT	NA	LT	LT	LT	12	155	1860	MSMEs and Large Industries
Fruit pulper (100 kg/h)	ST	ST	ST	ST	ST	88	0.79	69.52	Individual big farmers, FPOs and Cooperatives
Reefer vans 1600 kg	ST	ST	ST	ST	ST	55	3.6	198	FPOs, Big Farmers, Transporters, MSMEs and State Government

Refrigerated containers 10-20 tons capacity	LT	LT	LT	ST	LT	22	8	176	Transporters and Big Traders
Total Indicative Cost of Intervention (in Lakhs)								**5568.52**	

LT- Long Term

ST- Short Term

NA- Not Applicable

The total indicative cost of intervention considering the focus clusters is estimated to be amounting to Rs 55 Cr/-. These include both short term and long term interventions for all the clusters under the study.

ASSAM

Section 1: Summary & Methodology

Summary and Flow of the Report

The total production in Assam is about 3.07 lakh MT in 2019-20. Out of that the total production in the district surveyed amounts to 1.6 lakh MT which accounts for about 50% of the total production in the state. The major varieties that are grown in the state include Kew and Queen. Queen variety accounts for about 75% of the production in Assam.

Out of the total production about 96% of the produce is consumed as fresh fruit and traded in the market, whereas about 3% goes into processing in the state. A very minuscule percentage (<1%) of the total production is exported.

Now assessing the infrastructure at each leg of the value chain, these are the major gaps along with **weightage by the respondents** from the survey:

At farmer level-

- Small land holdings give rise to low sense of ownership and infrastructure setup **(95%)**
- Crops damaged by animals **(80%)**
- High cost of labor in evacuation owing to uneven hilly terrains **(80%)**
- Distant market and bad road conditions **(75-80%)**
- Lack of appropriate spacing between plants **(70%-Mostly seen in hilly areas)**
- Scarce availability and high cost of procurement of quality planting materials **(90%)**
- Lack of access to all weather roads **(65%-Dima Hasao and Karbi Anglong)**
- Lack of market intelligence **(95%)**

At trader/aggregator level-

- Involvement of too many agents in the value chain trade **(70%)**
- Lack of any regulated markets for pineapple in the state **(90%)**
- Lack of market intelligence **(60%)**
- Scattered and uneven production clusters **(90%)**
- Seasonal trading effect (2 months)**(75%)**
- Limited shelf life and absence of primary processing or shelf life enhancing techniques **(60%)**
- Lack of storage facilities **(75%)**

At transporter/logistical provider level-

- Lack of last mile connectivity **(65-70%)**
- Seasonal production during monsoons poses as a barrier because of submerged roads **(70%)**

At processor level-

- Lack of storage and pack houses for pineapple **(85%)**
- Lack of processing variety (Kew) availability **(40%)**
- Most of the farmers cultivate queen variety **(40%)**

- Lack of standardized cultivation practices **(65%)**
- Variability in size and quality of the produce **(65-70%)**
- Scattered production clusters **(80%)**
- Lack of availability of reefer vans and limited logistical connectivity **(65%)**
- Cost of procurement is high in comparison to other states **(40%)**
- Damages during transportation **(40%)**

So if cold storages and other primary processing facilities can be established at the cluster levels, that would somehow largely solve the issue of shelf life limitations and transportation related losses. In terms of investment, various small processing units are looking forward to expansion and subsidized machineries. Some of the FPOs were also interested to operate primary processing units in the cluster as well as branding of the products which would also make significant value addition to the products there by increasing the shelf life of the harvested crop.

Some of the specific recommendations in the report are:

Production end:

- SOPs/BMPs to be devised in consultation with Interested processing industries and making the farmers aware of the practices with continuous monitoring
- Contract farming model can be introduced to give the farmers/growers assurance of the market
- Buyer/Seller meet ups twice a year would help in standardization of quality as well as price
- Setting up of pilot model production clusters according to processing/export industry standards
- Supply of quality planting material merged with MOVCD scheme and in consultation with interested industries
- Introduction of high density farming model and awareness of the same at FPO/Cooperative level

Post Production:

- Farm level primary processing center including precooling, washing, sorting and grading activities on a pilot basis at Dima Hasao and Karbi Anglong
- Rental to be collected from the FPOs/Cooperatives to avail and capitalize those units
- Dedicated collection centers at major market places with MSP for pineapple
- Small capacity subsidized insulated vans (2-4 MT) to be provided to FPOs/Cooperatives
- Cluster based pack houses with provision of insulated vans
- Setting up storage facilities for pineapple in vicinity of collection centres as well as railway yards
- Setting up of canning lines for fruit pulp at district level
- Spray drier units at district level
- Fruit pulper to be provided to different FPOs/Groups

Marketing:

- Implementation of market intelligence system to bring transparency in pricing and demand for both buyer and seller
- Creation of Export zones in high production clusters like Karbi Anglong and Dima Hasao
- Transport hubs at major production clusters with availability of reefer vans and refrigerated containers

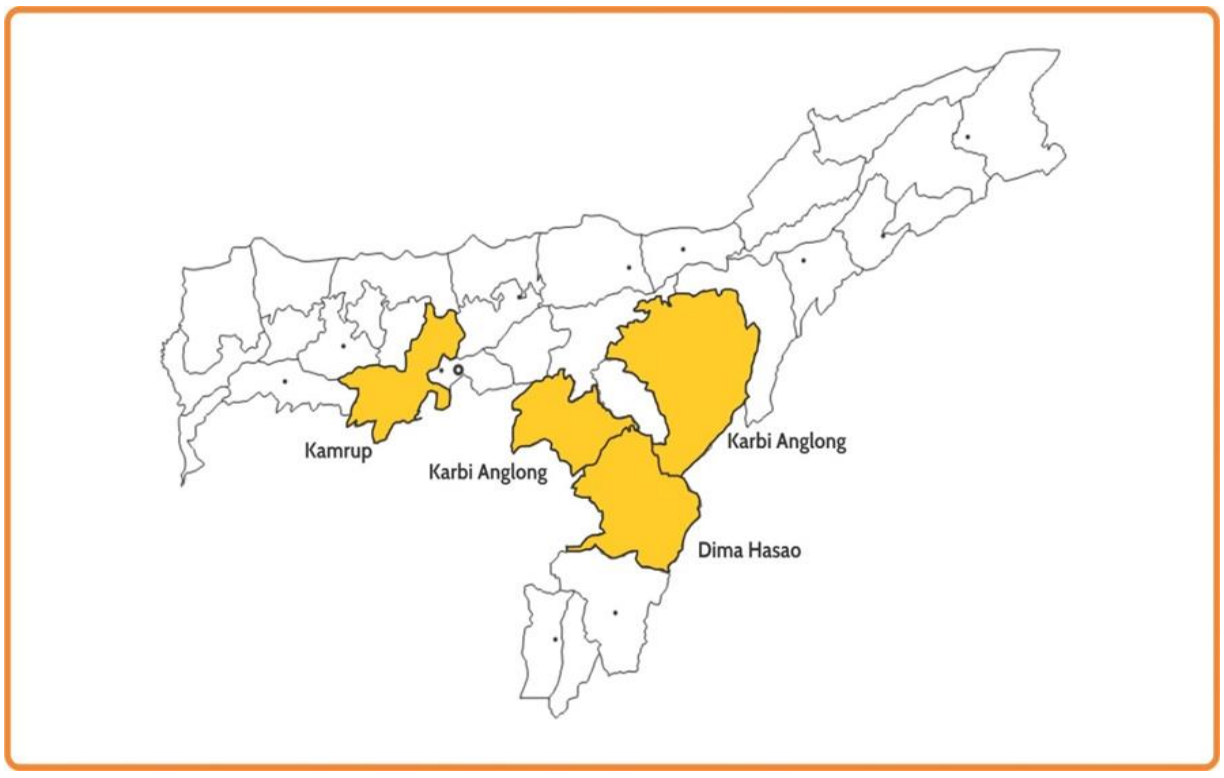
Approach & Methodology

The Assessment Study for Pineapple focuses on identifying gaps in infrastructure & processing facilities for development of potential value chains for perishable products under Operation Greens Scheme of MoFPI. The study has adopted both primary and secondary research tools. Preliminary research was based on detailed desk review of relevant secondary literature and interactions with relevant stakeholders during inception and subsequent stages. Primary research and assessment were based on the qualitative data/information that was collected through government official interactions as well as cluster/field visits and consultations with different stakeholders such as farmers, traders, processors, exporters etc. along with different enabling and institutional stakeholders.

Study Area

The following districts were taken into consideration for an in-depth study and gap analysis of pineapple value chain and their status of functioning which are prevalent in the state:

- Kamrup
- Dima Hasao
- East Karbi Anglong
- West Karbi Anglong



Stakeholder Consultation

The various participants covered during the primary/field level interactions included farmers, traders, small & medium scale processors and local retailers. Various discussions and consultations were carried out with Department of Agriculture, Horticulture, Industries etc. to get an overview of the prevailing situation pertaining to the status and gaps in the value chain. Suggestions were also noted from different department heads and other relevant stakeholders in order to successfully have an in depth understanding and deliver some constructive recommendations.

The identification of different focus groups and farmers was done in coordination and consultation with the district level officials which included District Agriculture Officer (DAO), District Horticulture Officer (DHO), Commodity Product Experts, Nodal Officers, Trainers and other opinion leaders at the cluster and village levels. Focus Group Discussions (FGD/s) were also carried out which covered some relevant topics like challenges in production, post-harvesting, storage, marketing, processing and other value-added services for the focus crop. Other information which included package of practices prevalent, cost of production, farm level value addition, primary processing facilities, access to market and logistics, access to processing facilities and barriers in the value addition process were also recorded.

Stakeholders	*Key points of discussion*
Industry Mentor	Existing scope & challenges
	Present Status of industry
	Scope of Investment
	Financial grants/schemes availed (if any)
	Line of business
	Types of products/product line in which company is involved in
	Expectation from the study
	Suggestion (if any)
Farmers/FPOs/FPCs	Existing challenges and opportunities
	Access to finance
	Marketing and access to markets
	Food safety standards and requirements
	Grants or schemes availed
Processors/Traders	Existing challenges and opportunities
	Access to finance
	Marketing and entrepreneurial skills
	Access to information/knowledge
	Certification (Organic & Geographical recognition)

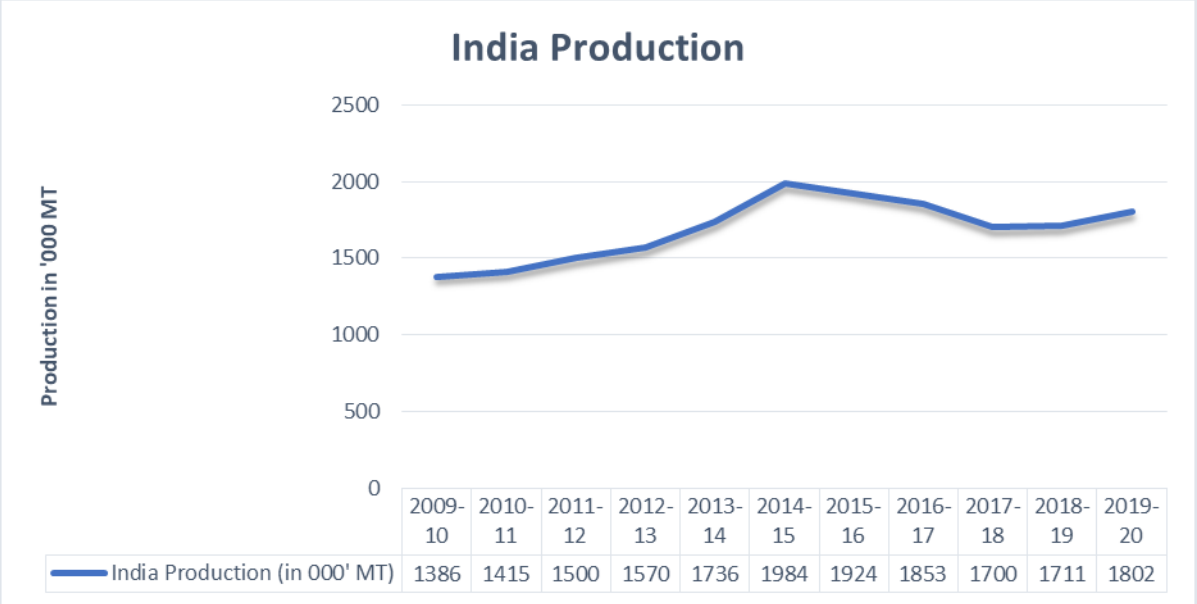
	Financial linkage and grants availed
District Officials	Sampling of clusters for primary research and evaluation
	District level support programs for small agri-food producers/processors
	Matching schemes and targeting mechanism
	Role of implementing agencies in districts if any
	Existing economic opportunities and existing market failures
	Prevalent schemes in the districts
	Secondary data collection
	Other challenges for the particular value chain
Statistical cell	Secondary data collection on production of commodities
State Officials/Directorates	Priority sectors and subsectors
	Discussion on ongoing and future programs
	Understanding the gaps between multiple support programs
	Secondary Data collection

Primary survey	
Stakeholders	***Number***
Farmer	104
Trader/Aggregator	44
State/District Government Officials	10
APMC	01
FPO/FPC/SHG/Cottage Pineapple Processing Unit	23
Transporter	36

Pineapple Production & Trade flow in Assam

Production in India

The total production of pineapple recorded by India in the year 2019-20 stands at 1802 thousand tones.



The above graph shows a gradual decline in production of pineapple following the year 2014-15. The reason as per the trend can be various factors, but the most crucial one of them would be decrease in area under cultivation for pineapple.

According to study and analysis, the region under the survey, especially the NER region contributes to approximately 40% of the total production of pineapple. Out of the total production from these areas approximately 90-95% of the production is organic in nature and cultivated through age old traditional cultivation practices.

State wise Production

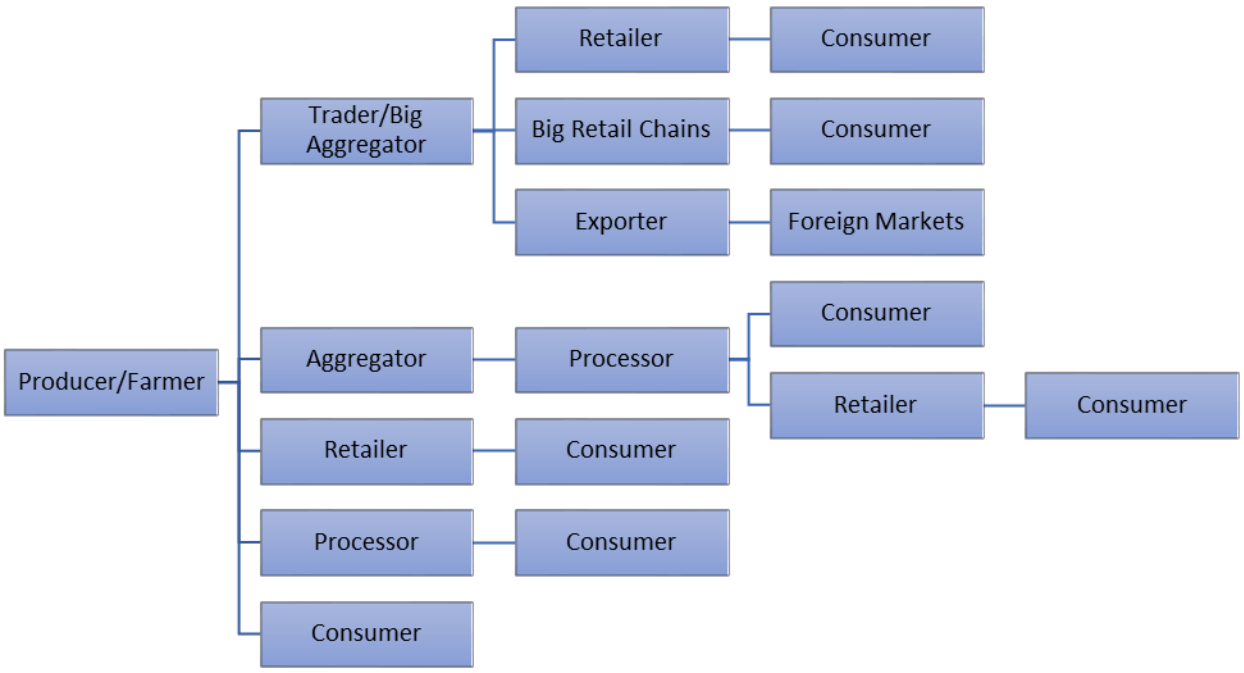
The table below shows the state wise production of pineapple in India.

Sl no.	State	2014-15		2015-16		2016-17		2017-18	
		Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)
1	West Bengal	320	16.13	330.06	17.15	336.11	18.13	345.15	20.3
2	Assam	281.27	14.18	285.17	14.82	268.92	14.51	296.52	17.44
3	Karnataka	156.31	7.88	155.41	8.08	164.26	8.86	163.73	9.63
4	Meghalaya	124.6	6.28	123.13	6.4	140.95	7.6	144.73	8.51

5	**Manipur**	136.75	6.89	128.51	6.68	127.03	6.85	134.11	7.89
6	**Nagaland**	142.5	7.18	127.81	6.64	132.62	7.15	132.83	7.81
7	**Tripura**	170.89	8.61	180.26	9.37	94.67	5.11	127	7.47
8	**Bihar**	116	5.85	116.3	6.04	116.58	6.29	115.13	6.77
9	**Andhra Pradesh**	35.96	1.81	55.38	2.88	64.41	3.47	71.33	4.2
10	**Kerala**	348.06	17.54	305.67	15.89	310.32	16.74	69.72	4.1

According to the previous table, West Bengal is one of the highest contributors towards pineapple production in India followed by Kerala and Assam respectively. Assam has 17.44% of total production share for pineapple in India.

The below mentioned diagram depicts the market channels prevalent in India for pineapple value chain.



Assam

Assam is considered as the largest economy in the North Eastern Region (NER) of the country. Assam is technically considered as the gateway to North India and then further to South East Asia. It has also got strategic locational advantage, in terms of tourism, scope of industrialization and an important point of bilateral trade owing to the vivid geographical and ecological characteristics.

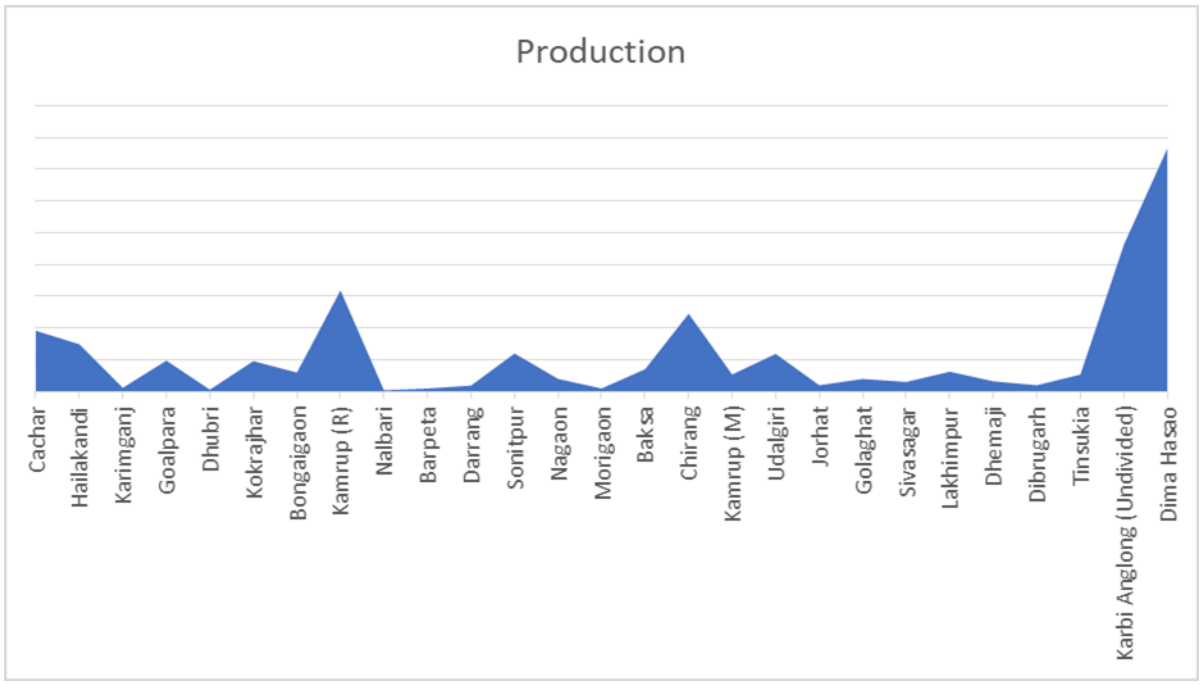
Pineapple Production in Assam

The table below consists of total area, production and productivity for all the districts in Assam:

District Wise Production			
District	**Area (in Hectare)**	**Production (in MT)**	**Productivity (in kg/Hectare)**
1.Cachar	1355	19773	14592
2.Hailakandi	1320	15474	11723
3.Karimganj	62	1213	19561

4.Goalpara	576	9892	17173
5.Dhubri	28	500	17843
6.Kokrajhar	524	9184	17527
7.Bongaigaon	296	5977	20196
8.Kamrup [R]	1563	31932	20430
9.Nalbari	84	337	4011
10.Barpeta	49	904	18442
11.Darrang	110	1898	17257
12.Sonitpur	680	11205	16478
13.Nagaon	248	4179	16852
14.Morigaon	57	1097	19237
15.Baksa	379	7255	19143
16.Chirang	895	18501	20671
17.Kamrup [M]	245	5360	21878
18.Udalguri	658	11841	17995
19.Jorhat	133	2685	20186
20.Golaghat	229	4058	17722
21.Sivasagar	162	3218	19862
22.Lakhimpur	208	4099	19706
23.Dhemaji	183	3409	18630
24.Dibrugarh	94	1934	20578
25.Tinsukia	260	5252	20196
26.Karbi Anglong	2488	51250	20599
27.Dima Hasao	3720	75092	20186
Total	**16606**	**307519**	**18518**

Source: Directorate of Horticulture & Food Processing, Assam, Data for 2019-20



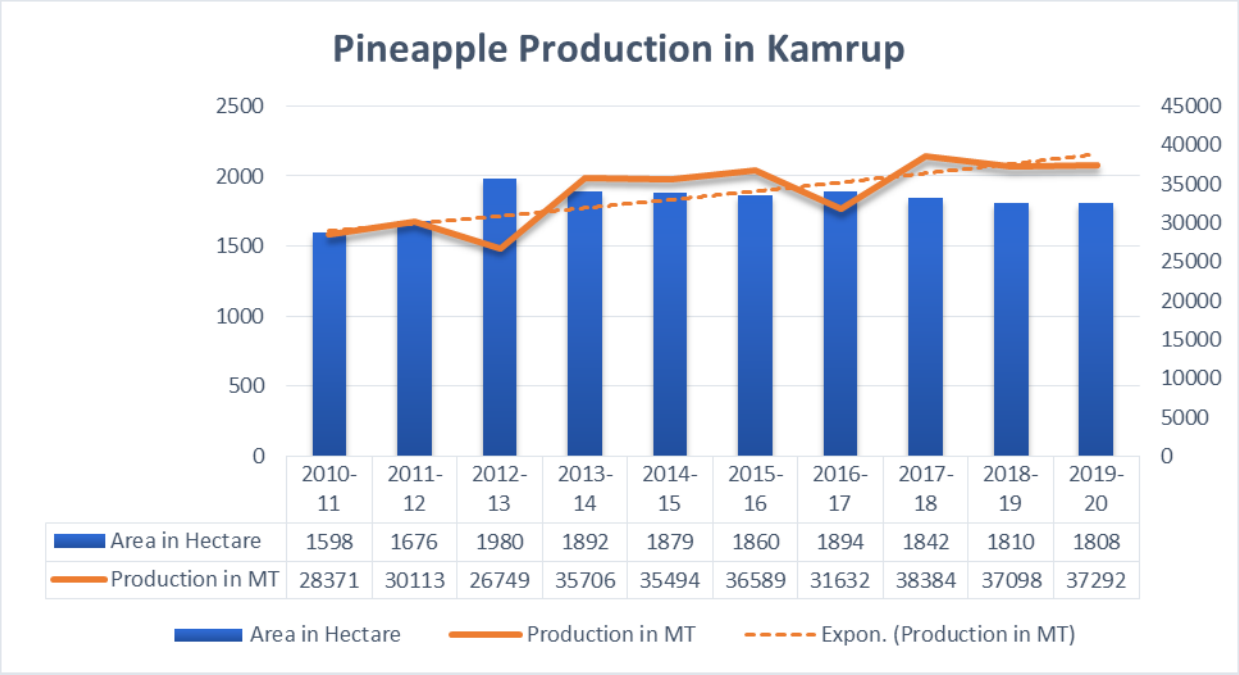
District Wise Production & Trade Flow

The major clusters which are part of the study are Kamrup, Dima Hasao, East Karbi Anglong and West Karbi Anglong. These districts are majorly known for the quantum of production of pineapple.

Kamrup

Kamrup district occupies an area of 4,345 square kilometres. In the immediate neighbourhood of the Brahmaputra, the land is low and exposed to annual inundation. In this marshy tract reeds and canes flourish luxuriantly, and the only cultivation is that of rice. At a comparatively short distance from the river banks the ground begins to rise in undulating knolls towards the mountains of Bhutan on the north, and towards the Khasi hills on the south. The hills south of the Brahmaputra in some parts reach the height of 800 feet (240 m). The Brahmaputra, which divides the district into two nearly equal portions, is navigable by river steamers throughout the year, and receives several tributaries navigable by large native boats in the rainy season. The chief of these are the Manas, Chaul Khoya and Barnadi on the north, and the Kulsi and Dibru on the south bank.[1]

According to the 2011 census Kamrup district has a population of 1,517,542 and a literacy rate of 72.81%. Rice is the staple crop of the district. The indigenous manufactures are confined to the weaving of silk and cotton cloths for home use, and to the making of brass cups and plates. The chief exports are rice, oilseeds, timber, and cotton; the imports are fine rice, salt, piece goods, sugar, betel nuts, coconuts, and hardware. A section of the Assam-Bengal railway starts from Guwahati and a branch of the Eastern Bengal railway has recently been opened to the opposite bank of the river. A metaled road runs due south from Guwahati to Shillong.



	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Area in Hectare	1598	1676	1980	1892	1879	1860	1894	1842	1810	1808
Production in MT	28371	30113	26749	35706	35494	36589	31632	38384	37098	37292

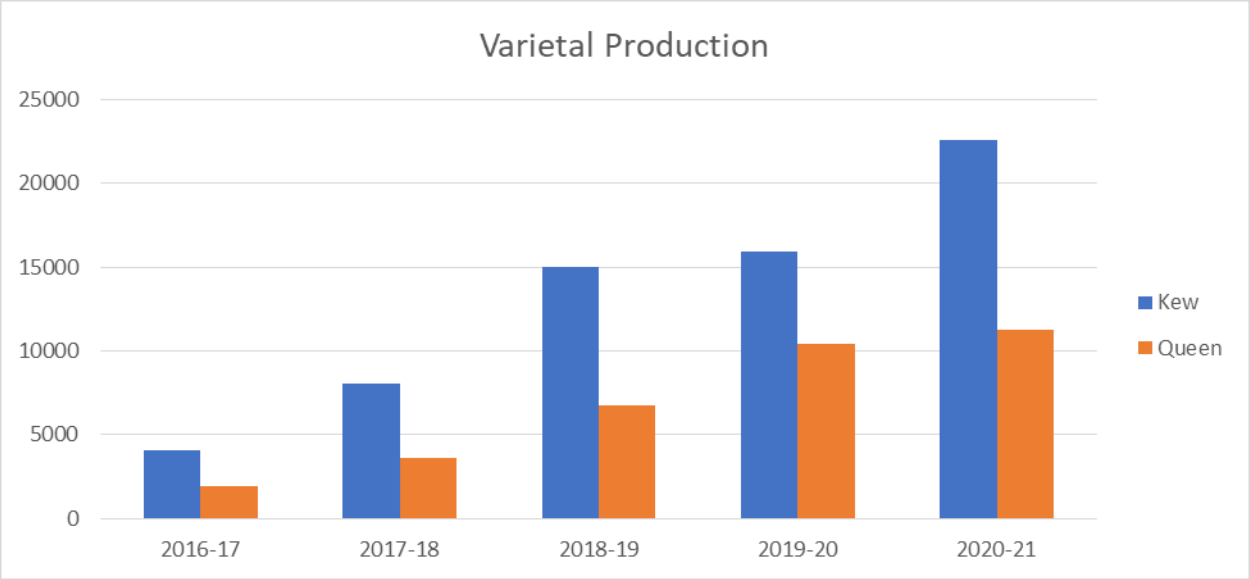
Source: Directorate of Horticulture & Food Processing, Assam, Data for 2019-20

The above graph depicts the production and area for cultivation of pineapple in Kamrup (Rural & Metropolitan). As seen from the above graph considering exponential average of production, it is

[1] Kamrup district - Wikipedia

seen that the production is showing positive curve and it may be inferred that the rate of production may increase provided ample market opportunities are made available for the stakeholders.

The major varieties of pineapple found in the district are Kew and Queen. Below graph signifies the varietal production in percentage under the particular crop.



Kew variety is abundantly found in Kamrup district which also happens to be the variety that is suitable for canning and processing. Though the cultivation practices involve traditional approaches by the farmers, some amount of training and handholding to the producers may yield varieties that are up to the processable standards and would be beneficial towards better raw material availability for food processing industries.

Kew variety production accounts for nearly 70% of the total production, whereas queen variety which is generally consumed fresh and considered as table fruit has a percentage share of about 30%.

Trade Flow

Considering Kamrup:

Channel 1 (93%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (2%)

Farmer➔Processor➔Consumer

Channel 3 (5%)

Farmer➔Consumer

As processing industries are not present in the cluster, pineapple is generally sold in fresh form to the consumers. There is a prominent unorganised market place in Boko which is known for good quality (Kew) pineapple. The pineapple growers from nearby blocks bring their produce to the

market where it is sold to the traders as well as end consumers. That market caters to bulk orders as well as orders from individual customers. As evident from the study there were no organised markets found during the period of study for pineapple.

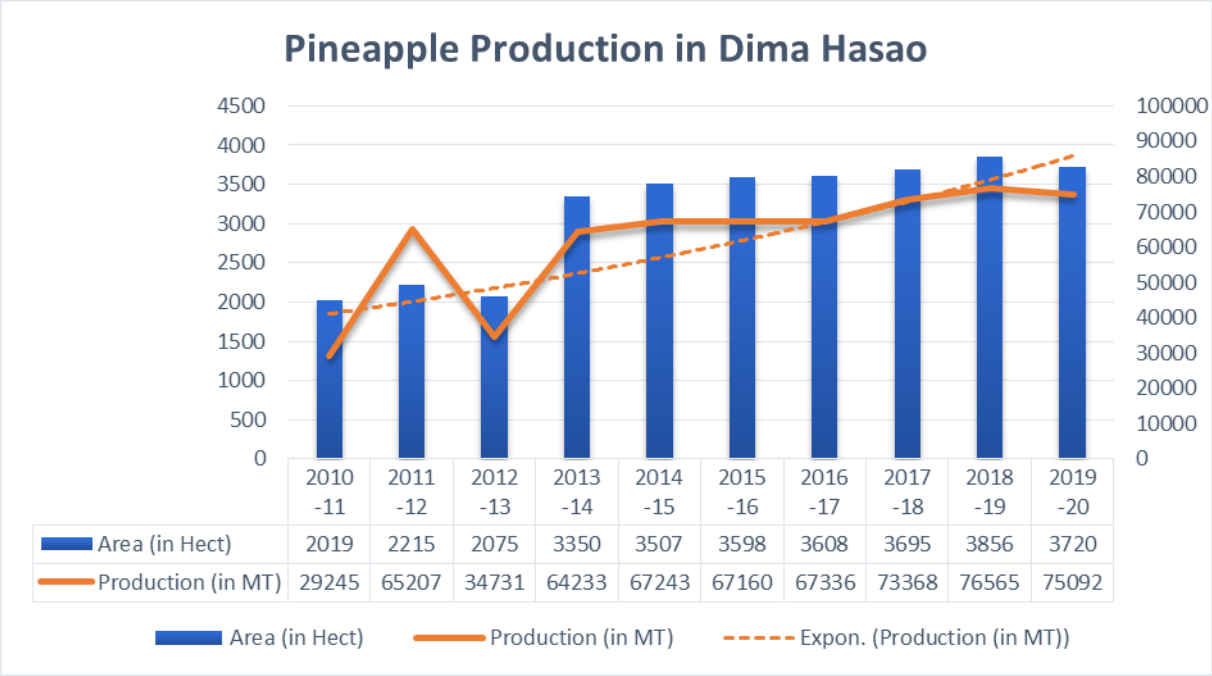
If we look at pricing in the trade flow: The farmers who bring their produce to the nearby markets and sell directly, sell their produce at Rs 22-25/- per piece (1-1.2kgs) in lean harvesting seasons whereas in peak harvesting seasons the prices drop to Rs 15-17/- per piece (1.2-1.5 kgs). At farm gate the prices are even lesser and the farmers sometimes do distress selling to the traders at as low as Rs 10/- per piece. These traders buy in bulk amount from the farmers at farm gate and farmers agree to the price as a risk mitigation measure.

Dima Hasao

Dima Hasao has a total land area of 4888 square kilometers which makes it the third largest district in Assam after Karbi Anglong and Sonitpur. The district is predominantly hilly due to the prominence of the Borail Range and the Shillong Plateau in the easterly and westerly zones respectively. The district is bounded on the east by Nagaland and Manipur, in the south by the the Barak Valley districts, in the west by Meghalaya and in the north by the districts of Hojai and East & West Karbi Anglong. Haflong serves as the headquarters for this district and this is where the office of the Deputy Commissioner and the North Cachar Hills Autonomous Council (NCHAC) Secretariat are located. Owing to its hilly terrain, there is a lot of variation in climate ranging from sub-tropical monsoon type to temperate alpine type due to the varying altitude. The headquarters Haflong sits at an altitude of 966 meters or 3188 feet which renders the climate rather pleasant with cool summers with temperatures ranging from 20 to 30 degrees Celsius and pleasant winters with the corresponding range of 8 to 25 degree Celsius. These temperature ranges and altitude make Haflong the only proper 'Hill Station' of Assam. The tallest peaks of the Borail Range are located in the district which are Thumjang and Hempeupet standing at 1866 meters and 1748 meters above mean sea level respectively.[2]

Dima Hasao has an enviable diversity of tribes which contribute to the unique social fabric of the district. It is a tribal-majority district with tribals constituting about 71% of the total population. There are 13 tribal groups inhabiting the district along with a significant number of non-tribal groups like Bengali, Nepali and Assamese. The major tribal groups in descending order of population are Dimasa, Kuki, Zeme, Hmar and Karbis besides other smaller tribes like the Khelma, Hrangkhol, Biates etc.

[2] District Profile | Dima Hasao District | Government Of Assam, India



Source: Directorate of Horticulture & Food Processing, Assam, Data for 2019-20

The above graph depicts the production and area for cultivation of pineapple in Dima Hasao. As seen from the above graph considering exponential average of production, it is seen that the production is showing an upward curve and it may be inferred that the rate of production is increasing exponentially but lack of adequate market opportunities and other barriers is limiting better price realization for the farmers. The major varieties that are found in the district are Kew and Queen. Though varietal data was not available, it was observed that most of the farmers grew queen variety of pineapple because of its sweetness and local market demand. Majority of the produce found its market in and around Assam and Tripura.

Trade Flow

The major marketing channels are:

Channel 1 (80%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (15%)

Farmer➔Retailer➔Consumer

Channel 3 (5%)

Farmer➔Consumer

The main reason for the above commodity flow being most of the farmers grew queen variety of pineapple which was consumed as a table variety. So, it found it's market with the local retailers and then consumed by the end consumer. Though as mentioned above, some small processing units were found in the district, but the quantum was very low as compared to other marketing channels.

Farmers here directly sold their produce either to traders at farm gate prices or at local market places themselves. However, there was a negligible difference in farm gate and open market prices. As they had limited access to larger market places, the traders in the district had the monopoly of deciding the price. As found out during our study and subsequent market visits, the price ranged between Rs 10-12/- per piece sometimes going up to Rs 15/- following seasonal variation and demand in the market.

Karbi Anglong (Undivided)

The Karbi Anglong District is situated in the central part of Assam, bounded by the state of Nagaland and Golaghat district in east, Hojai district in the west, Golaghat and Nagaon district in the north and Dima Hasao district and Nagaland in the south. The district with dense tropical forest covered hills and flat plains is situated between 250 33' – 260 35' North Latitude and 920 10'- 930 50' East Longitudes.[3]

The West Karbi Anglong district is a new district formed out of the Hamren(civil) sub-divisions of the Karbi Anglong district of Assam in 2016 with "Hamren" as its headquarters. The district is a part of "Karbi Anglong Autonomous Council".

Due to variation in the topography, this hill zone experiences different climates in different parts. The winter commences from October and continues till February. During summer, the atmosphere becomes sultry. The temperature ranges from 6 degree to 12 degree in winter and 23 degrees to 32 degrees Celsius in summer. The average rainfall is about 2416 mm. The population of the district is predominantly tribal. The major tribal ethnic groups of this district are Karbis, Bodos, Kukis, Dimasas, Hmars, Garos, Rengma Nagas, Tiwas, Man (Tai Speaking). Besides, a large number of non-tribals also live together in this hill region.

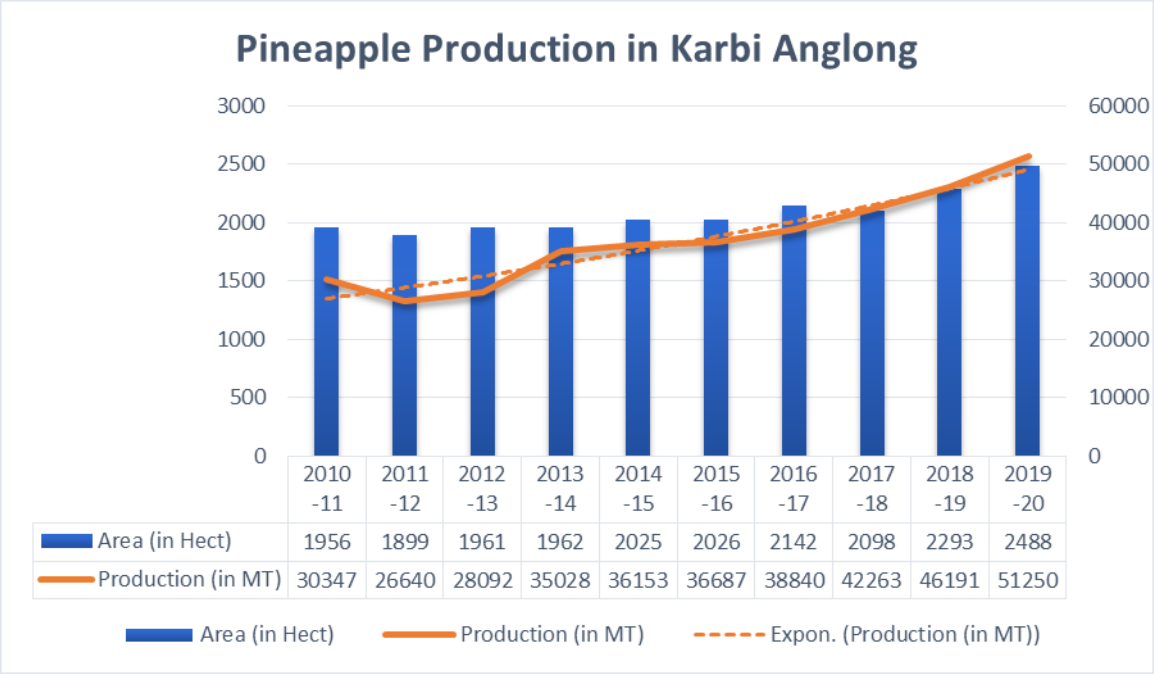
The district is well connected with other districts through various routes. On the north it is covered by NH-36 and on the east by NH-39. The internal routes are covered by the P.W.D.

- Road distance from Guwahati to Diphu (via NH37 and 36): 259 KM
- Road distance from Dimapur to Diphu (via NH 36): 55 KM

The railway passes through the district touching only a few points along the boundary. They are Borlangphar, Langsoliet, Nilalung, Diphu, Doldoloi, Dhansiri, Rongapahar, Khotkhoti and Bokajan.

- Railway distance from Guwahati to Diphu: 213 Km
- Railway distance from Dimapur to Diphu: 38 Km

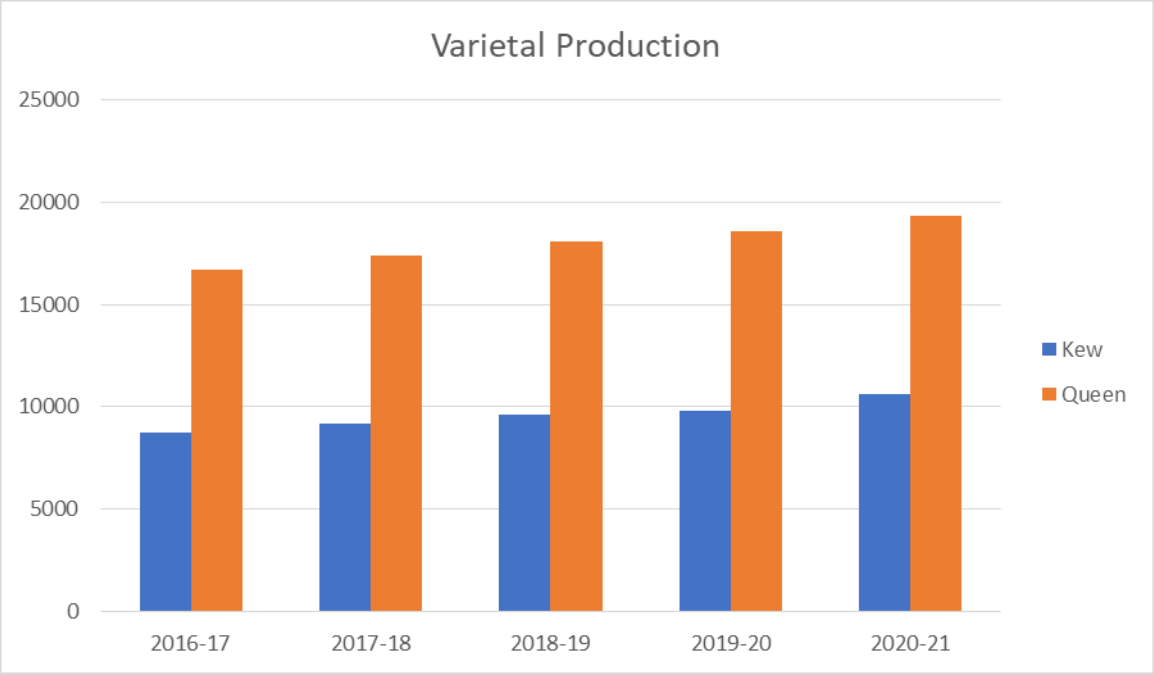
[3] District Profile of Karbi Anglong | Karbi Anglong District | Government Of Assam, India



Source: Directorate of Horticulture & Food Processing, Assam, Data for 2019-20

The above graph shows the area and production of pineapple for the last 10 years. The data shows that the production has an exponential increase especially after 2018-19.

Though varietal data for East Karbi Anglong was unavailable, the below data shows variety wise distribution of production for West Karbi Anglong.



Karbi Anglong has varietal variance somewhat aligned to Dima Hasao. As the two districts belong to same belt, therefore do have similar markets and production scenario. As most of the production is

of queen variety, the buyers mostly consume it as table variety. There are some small processing units which procure kew variety as well as queen variety in Karbi Anglong.

Trade Flow

Channel 1 (90%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (5%)

Farmer➔Processor➔Consumer

Channel 3 (5%)

Farmer➔Consumer

Most of the produce is sold to either traders/aggregators or directly sold in various nearby market places. As there are some small processing facilities which procure generally from unregistered groups of farmers it was seen that this district witnesses some amount of procurement via the processors.

The prices at the farm gate hovered around Rs 18-25/- per piece. Farm gate selling was the major mode of sales for the farmers of Karbi Anglong. The pineapples were traded in nearby open markets which were not organized at Rs 25-30/-.

During the survey we found that one SHG is doing some amount of processing. They are using manual technology for processing due to lockdown restrictions, their products were damaged. They now require fund to restart their unit and they don't have any marketing support from department. One of the FPC is also involved in processing and their consumption is 5 MT of pineapple per year. They were ready to upgrade their present unit subject to availability of funds as they have a capacity of 15MT.

Infrastructural Assessment & Gaps

As observed above, the value chain is mostly concentrated within the primary players in the state up to the point of aggregation and processing is at a very nascent stage (<1%).

Now the following study will talk about infrastructure, the way it is existing at each leg of the value chain and major identified gaps found thereof. It will be followed by recommendations to improve the functioning of overall value chain and make it economically viable and attract investments for the value chain and the sector as a whole.

Producer

The average land holding size of the pineapple farmers in Assam is 1.5 hectares. Most of the farmers here have their own land. The land usage pattern in the hilly areas like Dima Hasao and Karbi Anglong is however tricky as they do not have any ownership of the land and continuously expand their cultivation area whenever necessary. This sometimes gives rise to lose their sense of ownership of the field which also discourages them to setup any agri related infrastructure.

Most of the farmers in Kamrup faced the challenges related to animals damaging their fields whereas farmers from Karbi Anglong normally were facing challenges related to travel to distant markets owing to bad road conditions. As no significant transport was found and owing to bad road conditions they had to carry the pineapples manually.

The major gaps which were seen at the production end of pineapple included the conventional cultivation practices which proved to be non-commercial in the long run for farmers. In Kamrup region farmers were seen planting the pineapple plants without any focus on the spacing between them. When interacted, we got to know that they didn't follow any spacing technique ever and believed that planting without spacing gave more fruit per hectare. But they were deprived of the fact that spacing allows the fruit to grow in size and weight and provides required nutrition for the crop. Similar things were also seen at Dima Hasao & Karbi Anglong.

Apart from that scarce availability of quality planting materials was also one of the major gaps as found out in consultation with farmers. Though planting materials of high quality was available at some places the procurement cost of the same was too high for the farmers. Most of the farmers preferred to use the old mother plant and use the sucker from those plants to cultivate the crop.

No nutrition management practices were followed in the districts covered as 90% of the farmers responded that they were unaware of the same. In addition to that for the produce to remain organic the farmers do not apply any chemical fertilizers and pesticides; however, it adversely affects the productivity and end usage towards processing.

It was seen that rather than choosing a specific variety of pineapple for cultivation farmers choose the variety for which the graft and planting materials are readily available. Another factor which affected the crop during the cultivation was the havoc caused by some wild/domestic animals in the

farm. The farmers generally used bamboo fencing for their farms. Owing to the hilly terrains, the farmers generally do not have any financial support or linkage for the fencing activities in a farm. Bamboo fencing is normally damaged and is repaired every year which again adds up to the overall cost.

Considering evacuation of the produce from the farms, farmers in Assam face the challenges related to evacuation from the field owing to difficult terrains and lack of all-weather roads to and from the fields. This forces the farmers to carry the fruits on head loads, cycles or bamboo baskets majorly manual mode of evacuation which also results in some fruits getting damaged in the process.

Primary Processor

Primary processing specifically for Pineapple is non-existent in the state. So there are no washing, grading or sorting units for pineapple. However it is to be noted that there are primary processing infrastructure present in the states for other fruits and multi product usage may be explored in some of the below mentioned units.

The state houses:

- Mega Cold Storage at Sonapur and Changsar
- 26 Cold Storage Units
- 12 Soil Testing Laboratories including one under private sector
- 18 packaging rooms, 42 drying platforms and 15 processing units
- 126 godowns with a combined storage capacity of 5,59,455 MT

There was no sorting or grading facilities found anywhere throughout the state for pineapple. Washing was sometimes carried out for pineapples by some big farmers in Dima Hasao. But our study found out that none of the farmers were involved in primary processing and the sole reason being it did not have any positive impact on the price they were getting from the market. Washing also involved post drying activities which would again affect the immediate profit realisation post-harvest as there were no drying facilities found in the clusters. Traders always demanded immediate harvesting.

Lack of storage facilities for pineapple in the clusters also forced the farmers sell their produce immediately post-harvest or post ripening whichever is earlier. When asked about the interest of the farmers and traders involved in the selling of the produce, they were reluctant to go for any cold storage facilities if available pointing out increased cost of trade as the governing factor.

There are some traders and farmer groups in Kamrup, Dima Hasao & Karbi Anglong who are involved in small scale primary processing such as washing and grading but most of the activities are carried out manually.

Transportation & Logistical Service Provider

It was often seen that some individuals having a public carrier vehicle visit a farmer's garden and carry the produce to a nearby market as per trader's requirement. Vehicle used are generally 3-wheeler less than 1MT capacity, Maximo/Magic up to 3MT and TATA DI/Bolero Pickup up to 4 MT. There is no standard rate per km for transporters. Trader and transporter fix the rate of the transaction and there is no involvement of the farmers in transportation cost.

As transportation is one of the major concerns that affect the whole value chain functioning, in Assam as mentioned above last mile connectivity was one of the major issues that came out in the survey. Adding to that, closed container trucks/mini vans were not available at the disposal of farmers or traders or the aggregators who were involved in trading. Largely available open trucks/vans were mostly used in the transportation process which affected the quality of the fruit in the transit and caused an approximate loss of about 15-20% in the process. In long distance freights it was observed that the damage due to transportation and handling was the most.

Now for pineapple in Assam, the peak harvesting is done during the monsoons. But during these times most of the roads which are connected to the production clusters remain submerged and are non-conducive for any mode of transportation. This was the major concern of the transporters to make their vehicles available to the traders as well as farmers and they denied the service owing to the road conditions and increased cost related to the same.

Kisan Rail[4]

Sl no.	From - To	Date of Inauguration	Frequency	No of trips	Loading(Tonnes)	Revenue(Rs, in lakhs)
1	Chhindwara to New Tinsukia	28-Oct-20	As per demand	3	624	11.2
2	Indore to New Guwahati	24-Nov-20	As per demand	13	5,163	265.0
3	Ratlam to New Guwahati	5-Dec-20	As per demand	5	1,070	55.8
4	Nagarsol to New Guwahati	5-Jan-21	As per demand	13	6,591	361.7
5	Dhoraji to New Guwahati	3-Feb-21	As per demand	8	4,222	256.5
6	Dhupguri to New Tinsukia	2-Mar-21	As per demand	1	238	3.0
7	Yeola to New Guwahati	9-Apr-21	As per demand	1	514	28.1

Though the above-mentioned trains are available for the state of Assam, the level of utilization for pineapple is non-existent. The major reason being the lack of awareness and gaps in evacuation of the focus crop from the field. The other reason is the distance of the hubs from the production cluster. Major kisan rails run once in a week and pineapple being a perishable crop requires continuous transportation during the harvesting period.

Trader/Aggregator

About 95% of the total production is evacuated from the farms by the traders or agents. Most of the traders hire local agents from the field as small-scale aggregators and procure pineapple from the farms. Traders generally give some amount of commission according to the quantum of pineapple that is procured by these field agents. Some big aggregators in the district such as Karbi Anglong though deal on various fruits apart from pineapple.

No regulated markets were found across the state related to pineapple. Farmers generally sold their produce in bulk in the nearby weekly haats or unorganised markets according to the season. Some small and medium farmers also preferred selling the produce themselves on the road side owing to

[4] www.irctchelp.in

the small quantity that could be harvested as harvesting pineapple requires a lot of labour and farmers here do not find appropriate labour to carry out the activity.

Most of the pineapples farmers are deprived of market intelligence; hence fall to prey of decreased price realization. The processors or traders also face the challenge of scattered and uneven production. Owing to the limited shelf life of the pineapple, most of the farmers chose to dispose of their products immediately post-harvest and in the process lose the edge on negotiation.

Below mentioned are the major pineapple market hubs in the state.

1. Guwahati, Boko (Kamrup)
2. Lanka (Hojai)
3. Borr bazar (Nagaon)
4. Hamren (Karbi Anglong)

All the major fruits including pineapple find its way to the above markets from different production clusters of Assam. Especially in Boko & Lanka, it was seen that most of the farmers were selling the fruits directly to either the traders or end consumers. Boko is exclusively known for its weekly pineapple markets during harvest seasons, where farmers take the produce to the open market to sell them in bulk. The latest prices at Boko ranged between Rs 17-25/- per kg depending on the quantum of sales.

The market places at Guwahati were comparatively organized in terms of cleanliness and ease of doing business as some of the traders practiced online mode of payments and credit systems. There were no primary processing infrastructure found in the markets apart from negligible cleaning which was done mostly by the retailers at the point of sale.

Absence of any collection centres for pineapple also demotivates the farmer to grow ample quantity owing to the insecurity of the marketing for their produce. Most of the traders here depend on small agents who procure pineapple from the farmers and sell it to the traders. When we interacted with the traders, we found out that the major reason being traders were not interested to connect with each farmer separately as the quantum of produce is too low considering each individual farmer. So, they directly contact the local agents who ensure supply and, in some cases, ensure quality of the produce. Though some of the SHGs/FPOs have come forward in recent times to tackle the issue, most of the time there is an increase in the overall price due to the large and uneven network of distribution of the fruit. Government has also not been able to yet standardise the procurement price as it has limited access to the buyer markets.

Processor

Food processing in Assam including micro, small and medium enterprises (MSME) infrastructure is at a very nascent stage as found out from the study. For horticultural crops this may be one of the reasons for post-harvest losses, as ~ 40% of the commodities are perishable in nature.

Recently a Mega Food Park has been established in district of Nalbari. The focus crops are Pineapple, Orange, Banana, Ginger, Assam Lemon, Papaya, Turmeric, Potato, Chilly, Jackfruit, Bamboo shoot and Tomato.

Some of the processing units that are available in the state are:

Name of the Processing Unit/FPOs/SHGs	District	Capacity of Unit	Processed Products
Agro Horticulture Farmer Produce Company Ltd	East Karbi Anglong	5 Ton/year	Squash
Manju Tripti Fruit and Food Production Centre	East Karbi Anglong	100 quintal/year	Squash, Jam/Jelly
Community Canning & Training Centre Dept. Of Agriculture	East Karbi Anglong	5 quintal/year	Squash
M/s AINON Enterprises Pvt. Ltd.	Dima Hasao	2 quintal/year	Squash, Jam/Jelly
Deepjyoti SHG	Dima Hasao	1 quintal/year	Jam/Jelly
Boko Pineapple Producer Company Pvt. Ltd.	Kamrup	Testing phase	Squash, Jam/Jelly
Food Preservation Unit, Kekong	Karbi Anglong	8 quintal/day	Kaanch(Squash & Ready to serve)
DOCC & TC	Karbi Anglong	1 quintal/day	Squash, juice, jam
Processing facilities outside study area			
Sunny Agro Industries	Cachar	0.2 MT/day	Jam, Squash, Juice
Nature's Fresh Food Processing & Packaging	Cachar	3.3 MT/day	Mixed Jam, Squash, Ready To Serve, Drink

Owing to the above factors there were no substantial processing units found in the region. The small units which do some amounts of processing are still at a very nascent stage and 95% of the total production is consumed as fresh fruit across the state. So total quantum of processing put together, by all these cottage and MSME units for pineapple did not exceed 15-20 tons per year, owing to the limited capacity of the units and seasonal production and availability of the fruit.

As inferred from the interactions, no processing unit as of now in Assam is capable of exports to other countries. They generally cater to the domestic markets and some of the products find their markets in nearby states. The major reason as found out from the study was lack of standardisation of the produce and the variety of the produce available at large. Most of the growers preferred queen variety due to the sweetness. Lack of facilities such as reefer vans and limited availability of the logistical support from the state has turned down various interested processors to setup a unit in and around the state.

Apart from the above scenario, though some of the processed products are made available by small units in the market, but owing to the lack of proper branding, food and quality standards as compared to their competitors, they face challenges in overall market interest & sales.

Kamrup district has about 70% of the total production as Kew and also has better access to rad facilities owing to the proximity of Guwahati.

FPO/SHG/Cooperatives

The groups here are generally involved in collective selling of the produce. There were no significant value additions done through the groups as of now. However, some of the SHGs as mentioned above were involved in negligible amount of processing which was mostly done manually.

Most of the farmers are not part of any schemes that are prevalent in the state. Many farmers who were part of some groups/fpos/cooperatives didn't fully understand the availability of the services that the groups have. In many cases farmers were just part of some groups, but they carried out production and marketing of their produce on their own/individually.

Retailer

Retailers here in Assam are generally seen selling fresh fruit rather than any processed variety. Major retailers were observed at market places like fancy bazaar in Guwahati. They generally sell bulk quantity of pineapples which was approximately 1-2 ton a day during peak seasons. Another major buyer of pineapple were the juice shops in the market. Majority of the value addition on the retail front was see by these shops. Some small retail chains in cities like Guwahati, Silchar and Nagaon also procured the fruit from the aggregators and sold it.

Other Interventions

Recently a consignment of 150 pineapples and 50 pineapples was sent from Nabamilan FPC, Sonitpur along with fruits like Jackfruits and Assam lemon to AR4 Agro International Exporter, Hyderabad and Delhi respectively through APART, Sonitpur. Another market linkage was created by APART from Boko Organic Pineapple FPC of 2.5 MT to Riaseom Agrotech Pvt Limited and Sam Agrotech Private Limited, Hyderabad. Though the above consignment was sent through different market linkage channels, the pineapple was organic in nature and would be used as a table variety.

Recommendations

Considering the above assessment of the overall value chain and infrastructure capabilities of the state, existing processing is very low. Major gaps were found with the production and continuous supply of raw materials to the industries. Challenging terrain and lack of all-weather roads is also a major issue considering harvesting and evacuation of the crop which makes it difficult to be competitive, and therefore the major strategies should focus on improving economies of scale, production quality standardisation and proper branding & marketing of the produce.

So it was observed that rather than only uplifting the existing processing, a holistic development needs to be done in terms of other infrastructures as well. Only with such substantial changes, both trade and processing would take a significant leap.

The following are some of the recommendations that are made accordingly, highlighting suggestions at each leg of the value chain.

Production

Best Management Practices (BMPs) could be devised in consultation with interested processing industries/institutional buyers and horticultural experts to minimise gaps related to quality and varietal availability of the fruit.

Along with ensuring implementation of the Best Management Practices, contract farming by major buyers will ensure market availability for the farmer as well as the trader and would encourage farmers to follow the BMPs.

Model pilot production clusters to be identified by the horticulture department in consultation with large processors or traders to minimise the gaps related to scattered production. These pilot projects also need to be monitored closely by the experts and industries in order to streamline pre-production and production related gaps.

Availability of quality planting materials according to BMP devised in collaboration with the processing/institutional buyers could be facilitated on a pilot basis by these industries and can be merged with MOVCD scheme in order to ensure supply of required quality and variety of input materials. Continuous monitoring is the need of the hour.

Introduction of high-density plantation would also be beneficial in terms of increasing production per hectare along with standardization of fruit.

Primary Processing

Introduction of cluster based primary processing centre would be a relief for farmers and would substantially also increase the quality of procured products by the processors or traders. These units can be setup by the government as pilot projects. Traders and farmers could be encouraged to avail those services on a small rental basis. This is a necessity in some clusters like Dima Hasao and Karbi Anglong because this would help the fruit increase its shelf life as well as save it from transportation related losses.

Collection centre at prominent market places with standardised pricing/MSP would encourage the farmers to produce larger and better quality of pineapple and would be ultimately beneficial towards contribution of raw materials to the industry. This would also ensure continuous supply of the fruit along with a standardised price mechanism.

Introduction of small capacity subsidized insulated vans (2-4 MT) to the FPOs/Cooperatives would help in overall evacuation of the crop as well as a medium to capitalise them when not in use.

Development and monitoring of subsidized cluster based pack houses and cold chains at major production clusters such as Dima Hasao, Karbi Anglong and Kamrup would be beneficial for increasing the shelf life of the crop as well as giving a buffer time to the processors to collect the crop from the point of origin.

Setting up of storage facilities in the vicinity of production and processing clusters like Dima Hasao and East Karbi Anglong, would increase the shelf life of these fruits there by increasing the overall operational period to process the raw materials by the units. This would also to some extent ease out transportation related losses which is mentioned below.

Marketing

As evident from the field visits lack of proper identified market places for pineapple was a major hindrance in distribution and disposal of pineapple from the clusters. These gave rise to several folds of agents in the same district and this in turn increases the overall price. Most of the traders had to buy pineapples at a higher price from the agents without any significant value addition. In addition to the collection centres the markets need to be established with support infrastructures and storage facilities to streamline the process of product distribution without unnecessary price escalation.

Market intelligence information could be shared with the farmers regularly with details such as current prices, relevant trader/ processor information, quantity required and mode of payment to be undertaken, to give the farmer an overall idea of the demand market he/she needs to cater. This can be started as a pilot project with some FPCs/FPOs initially.

Export zones in high production areas like Dima Hasao and Karbi Anglong could be beneficial owing to the organic characteristics of the fruit in the region. Organic pineapple has also got huge demand in international markets, so branding and appropriate marketing of the same would be beneficial for the fruit and bring in future investments

Processing

As found out from the study and subsequent consultations with the stakeholders, standardisation of input materials and making the right variety (Kew) available abundantly is the need of the hour. Apart from that continuous transportation support from different logistical service providers would ensure uninterrupted supply of raw material once the quality standards are ensured. To ease out the procurement of raw materials for processors collection cum primary processing centres at cluster level are a necessity. Apart from those, provisions could be made at the collection points to furnish real-time data online to keep the institutional buyers well informed.

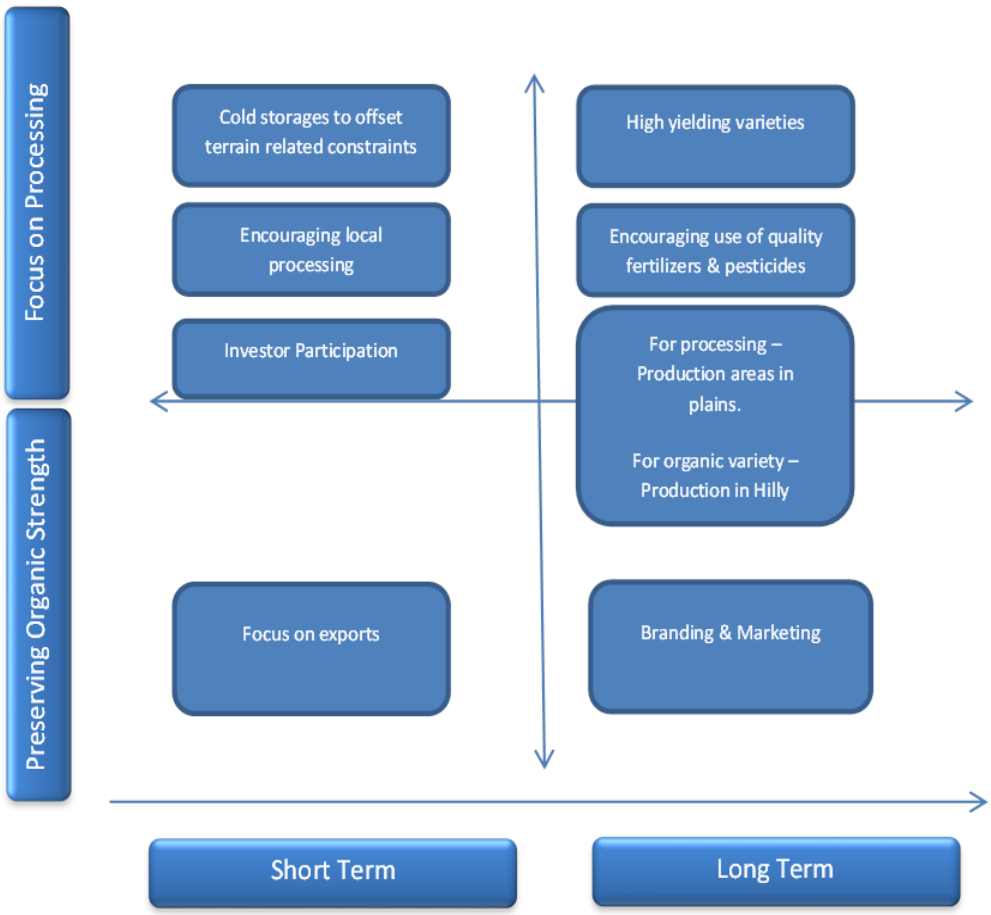
For now a processing unit of minimum 15 tones can be proposed and established at the vicinity of Boko(Kamrup) owing to 70% of the total production as kew variety and access to good quality infrastructure as compared to Dima Hasao and Karbi Anglong. Currently only 2% of the production from Kamrup goes into processing.

Credit Linkage

Though different support schemes and credit linkage systems are made available and FPOs/FPCs are formed to streamline marketing related issues, still a lot needs to be done in terms of stakeholder awareness in order to make the farmers understand and exploit the benefits of the above.

Summary of Recommendations

So summarizing the above, the below mentioned matrix is made in terms of pineapple production and need to preserve these on one side and simultaneously uplifting the processing of the fruit.



Though we are assessing pineapples in the region for processing, the organic nature of cultivation of the product also makes it stand out. So steps could be taken for processing as well as preserving the organic characteristics of the product. Proper branding and marketing of organic pineapple would interest the international markets to procure them from the region. Recent interventions for exports by organizations like APART and APEDA have proved that there is a huge scope of pineapple exports from the state as well. Though export channels can be explored, certification for exports remains a

challenge for most of the farmers. So certification awareness drives specifically in remote areas like Dima Hasao and Karbi Anglong would give the pineapple farmers a greater reach of the markets.

Context & Interventions

The following are the major issues that came up during the assessment for Assam:

The pineapple harvesting season in Assam starts from July and goes on till December. The typical harvesting practices include evacuating manually from the orchards. As harvesting of pineapple is a labor-intensive activity, farmers in the districts such as Dima Hasao and Karbi Anglong generally couldn't find affordable labour and carry out the harvesting manually. The fruit is collected in a basket made of bamboo and then evacuated from the fields. This results in very low quantum of the produce being harvested in a day which comes to around 100 pieces per farmer. This results in on field damage of the crop and some farmers reported that the damage was close to 10-12% of the total harvests.

Considering transportation, the major problem is with the availability of last mile connectivity of roads till the farms and lack of all-weather roads. But we are not considering any interventions for the same here. Because of the above road conditions, the time taken for the produce to be transported from districts like Karbi Anglong & Dima Hasao to Guwahati sometimes take around 8-10 hrs and more during monsoons (Peak Harvesting). During such transit, majority of the produce (5-8%) gets damaged, adds up to the overall loss in the commodity flow. The peak harvesting happens during monsoons which makes the transportation even more difficult. During such seasons the vehicles get stranded sometimes 1-2 days, which in turn adds up to the damage of the fruit and transportation related losses.

Similarly considering marketing of the produce, the farmers mostly prefer farm gate selling as individual contribution to the total quantum of harvesting is very low. Most of the traders and aggregators go to the farm gate to collect the produce and fix the price solely on visual inspection. Absence of any sorting or grading facilities at block or district level, forces the farmers to sell their produce as a lot and mostly at a very low price (Rs 10-12/-) especially during peak harvesting. This was more prevalent in districts such as Karbi Anglong and Dima Hasao. Farmers in Boko (Kamrup) preferred selling the produce at weekly haats in the local markets and it was often seen that most of the traders from nearby states like West Bengal also procured from the haats. The major reason being the ease of transportation from Kamrup and the proximity to major aggregation & marketing points from the cluster.

Processing of pineapple in Assam is still at a very nascent stage. Some small-scale units as mentioned, though are involved in some amount of processing, the total quantum of pineapple processing doesn't exceed 15-20 MT per year from the state. Most of the pineapple is consumed as fresh fruit in the state and the rest finds its market through aggregators and traders to other nearby states such as West Bengal. The markets in Guwahati also caters to pineapple from states like Meghalaya and Tripura. In terms of variety kew is mostly available in Kamrup whereas Queen is available in districts of Dima Hasao and Karbi Anglong. If we take the whole cluster in to consideration including Kamrup, Dima Hasao and Karbi Anglong. Majority of the products processed in Assam include Squash, Jam and Jelly.

The above gaps are calling for interventions in the form of cold storages, driers, reefer vans, primary processing/minimal processing units and secondary processing units. Other than the above which are mostly infrastructure related, there are other gaps that needs to be addressed in order to facilitate effective use of infrastructure. Both types of initiatives need to go hand in hand.

Districts	Recommendation with indicative units	Why are we making the recommendation	How implementable is this recommendation	Indicative Costing (in Lakh x unit)	Investment Interest	Remarks
• **Karbi Anglong East** • **Dima Hasao** • **Karbi Anglong West**	APEDA certified Integrated Packhouse 1 TPD capacity (3 no.s) 1 in each district	• 70-80% is organic queen variety • No pack houses available	Long term	50 x 3 = 150	Large industries, HNI individuals and Warehouses	In terms of investment interest, assumptions were taken on target beneficiaries as the current study was limited to 3 districts and there were no interested investors. However our analysis and field assessment suggests that there is a dire need of pack houses for pineapple in each district.
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Mobile Pre-cooling Units (5 no.s) 3 in Dima Hasao and Karbi Anglong(East & West) each and 1 in Kamrup	• No precooling infrastructure available • Transportation of the produce is affected due to monsoons and bad weather	Short term	25 x 5 = 125	FPOs, Cooperatives and District administration	During the survey though some of the FPOs were interest in new technology adoption, lack of funds and COVID related losses have given them a setback
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Farm level sorting and grading facilities – 1MT/hr (5/district)	• No scientific method of pricing is followed. • Farm gate prices are sometimes only 20-30% of the retail price	Short term	15 x 20 = 300	FPOs, Groups and Small industries	Interaction with different groups, official and industry mentor revealed the interest of different unregistered and registered group of farmer who wanted sorting and

						grading infrastructure to be present at farm/block level.
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Canning line for fruit pulp 2TPH (1 in each district)	• Minimal processing like canning may reduce the overall loss in the value chain flow • No infrastructure found for canning in the districts	Short term	67 x 4 = 268	MSMEs and Large Industries	Though the survey did not reveal any specific investors for the said intervention, establishment of canning facilities in the districts would is highly recommended by the various stakeholders during the survey.
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Spray drier units for each district	• Dried & powdered pineapples are known to have better price realization. • Will be a viable model considering the quantum of produce	Long term (4-5 yrs)	155 x 4 = 620	MSMEs and Large Industries	Setting up of spray drying is proposed keeping the market demand and quantum of production. Many small units were also interested on the idea, however not in the next two years. So this may be considered as a long term but definite intervention.
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Fruit pulper (100 kg/h) to be provided at district level groups or FPOS. Minimum 40 no.s to be provisioned for farm level operations for the state	• Pulping is one of the techniques to increase shelf life of the commodity and make it processing ready • Pulping would help in long term utilization as a raw material for industries	Short term	0.79 x 40 = 31.6	Individual big farmers, FPOs and Cooperatives	Rather than a business proposition, availability of fruit pulper is a necessity in the cluster owing to unavailability of on time transport facilities and transit related losses. Pulping would improve price realization and ensure continuous raw material availability for the industries. FPOs and other

						unregistered groups have shown interest in the intervention.
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Reefer vans 1600 kg to be provided at district level – 5 for each district	• It was observed that losses during evacuation and transportation was 5-8%.	Short term	3.60 x 20 = 72	FPOs, Big Farmers, Transporters, MSME and state government	As temperature controlled environment in transportation of the commodity plays a major role towards avoiding transit related losses, many transporters and FPOs have shown interest towards investment in the same
• **Kamrup** • **Karbi Anglong East** • **Karbi Anglong West** • **Dima Hasao**	Refrigerated containers 10-20 tons capacity to be provided at district level – 2 for each district	• For long distances open trucks are used which expose the pineapples to harsh weather conditions and most of the fruits get damaged or become unfit for consumption	Long term (4-5 yrs)	8.00 x 8 = 64	Transporters and Big traders	Though there were no investment interest shown for this proposal in the short term. This intervention will help transporting the commodity to long distances and transporters mentioned that they are interested in such interventions in the long run if made available.
Total Cost of Intervention (Indicative)				**1630.6**		

Hence the total indicative cost of intervention comes to Rs 16.30 crores for the cluster which include Kamrup. Dima Hasao, Karbi Anglong East and Karbi Anglong West.

However it is to be noted that, although there are clear gaps in terms of enabling infrastructure which have been identified, and the scope of intervention have also been proposed, still we were not able to find clear interest from the investors in terms of investing in pineapple value chain. So all the above recommendations are subject to a big “if”, i.e; Subject to finding potential investors for the above interventions.

The major reason that most of the potential investors in the clusters are denying investment is due to lack of supporting infrastructure and market place unavailability for the product. Pineapple as a

product has been significantly consumed as table variety in and around the cluster since years. Though there were some recent interventions which led to market linkages for the product, still widespread marketing and branding of the product is the need of the hour. In addition to that the sample stakeholders were not interested to invest, solely due to lack of awareness of the information and adverse effects of COVID19 related scenario.

However the above recommendations were made based on the field interactions as well as analysis according to the nature and scope of setting up of such infrastructure. It has been clearly emerging that absence of basic enabling infrastructure such as roads, markets etc. has been the major gap which if addressed would gradually encourage the investors to take up the above activities and strengthen up the value chain.

Interactions

Meeting with State Government Departments

Shri. Triranga B. Borah, Director, Department of Horticulture & Food Processing, Assam

Had a meeting at the office of The Directorate of Horticulture & Food Processing, briefed him about the study and the then status of work and collected insights on the present functioning of the value chain considering each concerned stakeholder in the pineapple value chain along with recent developments.

As per the discussion, Pineapple in Assam is majorly consumed as a table variety or transported to other neighbouring states to be sold in the market. Processing of pineapple in Assam is still at a very nascent stage partly due to the quality of production and partly due to scattered availability of produce. Farmers here generally follow traditional methods of cultivation which affects the overall size and processing capability of the particular fruit. Cachar is one of the largest producing districts for Pineapple in Assam.

Some recent developments in Assam have facilitated export of Pineapple in smaller quantities from different FPOs whose record are not yet updated but assured support in terms of data facilitation.

Shri Bharat Rajbonshi (District Agriculture Officer, Kamrup)

A meeting was held at the District Agriculture Office in the presence of Shri Rajbonshi along with Mr Yousuf Ali, Assistant Director of Agriculture and Mr Hemen Das, District Nodal Officer.

Initially discussed regarding the present status of production and processing capabilities of the district. Got to know that there were no specific updated data available regarding pineapple currently. Was advised to take data from primary survey sampling methods. Regarding schemes, we got to know from the discussion that as of now under Mission Organic Value Chain Development (MOVCD) scheme the farmers get plants and micro nutrients for cultivation.

Mr. Purna Basumatary District Agriculture Officer at Karbi Anglong West district (headquarter Hamren city)

was of the opinion that grading is essential for selling to the processing units. Local farmers do not need packaging. But packaging is required for transporters / logistical service providers transferring the produce outside the state or in other countries. The pineapple in the area is 100% organic but all the farmers don't have certification. Usually, there is a disagreement on the selling price of pineapple between traders/processing units and the farmers. The traders/processing units want to pay a low price to the farmers; hence the farmers prefer to sell their produce to local traders/aggregators and directly to end consumers. No significant support is provided to the farmers by the government. There is a requirement of an Agricultural Marketing Board to develop an efficient, hassle - free and modern marketing system in our State. Infrastructure such as roads and cold storages are required. Testing facilities are required to check whether the product is organic or not, sugar levels and other restraints. There is a requirement of forward and backward

linkages to the pineapple value chain and this will be possible once trains are provided to the district and the village is connected to the markets by a proper network of roads.

Mr. Bidu Raijung, District Agriculture Officer at Karbi Anglong East district

shared that there were no primary and secondary processing facilities in the district as per his knowledge. Earlier, there used to be a secondary processing unit at Deithor producing natural fruit juices from locally available raw-materials like Pineapple, Oranges, Mango, Litchi and other citrus fruits in “KarbiAnglong and North Cachar Hills” (now DimaHasao) under the "KANCH" brand but this unit is not functional now due to the raw material selling price dispute with the farmers. They are currently seeking proposals and funds for processing for pine apple. Some FPC have recently started exporting directly through APEDA. There is a need to provide training to individuals and SHG for preparing juice and jam jelly. There are no APMC in this district. The district officer had sent a proposal to the council for processing but they replied that processing is currently not a priority. The Marketing system needs to be organised and that seems to be the need of the hour.

Mr. S.Thangeq, Assistant Horticulture Officer, Karbi Anglong East district

was of the opinion that the pineapple was being supplied to nearby markets such as Dimapur, Jorhat, Golaghat, Nagaon and Guwahati. The markets have government constructed sheds. According to him, the horticulture mission for north eastern states is funded by State-Owned Priority Development (SOPD) and these funds are utilized towards capacity building, technical training and other initiatives.

Mr. Raju Deka, Trainer (FPOs/SHGs/FPCs)

Shared that they process around 75 litres yearly which is sold by the brand name SIRMAN in a shop in the Krishi Bhawan, Diphu. This government funded organization also provides training to around 200 individuals and 5 SHG annually.

Mr. Pawan Boro, Assistant Horticulture Officer, Dima Hasao district

was of the opinion that the government supported MSME unit must be revived. Further, there is a need for cold storage to ensure availability of pineapple in the off season. There is a need for a double line track from Lumding to Silchar which is currently operating on single line. Moreover, in road infrastructure special attention is to be given to construct all weather roads for efficient mobility.

Mr. L. Tuolor, Deputy Director Horticulture

was vocal that there were no schemes for farmers. He suggested road infrastructure gaps upto the farms in village / remote areas where the produce is cultivated as one of the major challenges.

Mr. M.Terangpi, General Manager, District Industry Centre, Directorate of Micro, Small & Medium Enterprises, Assam

was of the opinion that only big factories in the area pertains to cement industry, rest are all micro units. The concept of a dedicated zone for an industrial park seems a good idea but there are land constraints in the area. The department has been implementing the Prime Minister’s Employment Generation Programme (PMEGP) by merging the two schemes that were in operation till 31.03.2008 namely Prime Minister’s Rojgar Yojana (PMRY) and Rural Employment Generation Programme (REGP) for generation of employment opportunities through establishment of micro enterprises in

rural as well as urban areas but there is no interest in this scheme. Some initiatives are required to provide financial support to sick industries to revive their existence.

Meeting with Industry Anchor

Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India)

Gathered insights on the present functioning of DelMonte Processing Capabilities and pineapple value chain. The major processed products for pineapple by DelMonte which are available in India are mixed fruit juice, crush fruit juice, slices, cocktail, pineapple chunks, pineapple tidbits etc.

Coming to the procurement model of raw materials, Mr Bellani shared that most of the pineapple products were imported from Philippines as there are no available processing industry for pineapple in India by DelMonte. They did have some third-party tie ups but somehow didn't work out because of shortage of quality raw materials. The marketing channel of DelMonte includes both B2B and B2C model of distribution. Recently DelMonte products are also available through various E-Commerce portals.

There is some amount of processing going on in Karnataka as of now, but they are interested to setup a unit close to large production clusters with ample scope of transportation, electricity and other industrial facilities. They had also tried to setup units in Siliguri back during 2008-10 but failed in the process owing to shortage of quality raw materials and scattered production clusters. Procurement of raw materials from Tripura and other closer production cluster was also problematic owing to the issues in transportation and logistics along with labour related issues.

As of now the company is willing to invest in setting up the units as well as contribute towards training and capacity building of FPOs/Cooperatives who are interested to work with them. Company is also willing to carry out monitoring activities for various cultivation related issues during the process of pre harvest, harvest and post-harvest of pineapple. The organisation is also planning to explore options like pre-contracts in the near future.

Schemes & Policies

The following schemes are summarily related to processing and other infrastructure for pineapple in Assam.

Industrial & Investment Policy of Assam, 2019[5]

The policy came into effect from 1st September, 2019 for a period of 5 (Five) years.

Investor Facilitation

With the objectives of attracting investment in a more structured, focused and comprehensive manner, State Government has created a dedicated "Invest Assam Foundation" (IAF) in the line of "Invest India" of Government of India. This agency will act as a first reference point of any investor interested in Assam and will provide hand holding and facilitation to investors for setting-up their business. This agency will further act as an image building tool of the state within and outside the country, organizing seminars / road shows and try to increase significant inflow of investment to the State.

Fiscal Incentives

State Goods and Service Tax (SGST) reimbursement

Category	Limit of Tax Reimbursement	
	For units set up in areas other than special parks (specified in next column)	**For units set up in Plastic Park, Bamboo Park, Food Park, Tea Park and other Parks developed by or in collaboration with State/ Central Government**
Micro Enterprises	15 (Fifteen) years subject to maximum of 200% of Fixed Capital Investment.	15 (Fifteen) years subject to maximum of 250% of Fixed Capital Investment.
Small Enterprises	15 (Fifteen) years subject to maximum of 150% of Fixed Capital Investment.	15 (Fifteen) years subject to maximum of 180% of Fixed Capital Investment.
Medium & Large Enterprises	15 (Fifteen) years subject to maximum of 150% of Fixed Capital Investment.	15 (Fifteen) years subject to maximum of 150% of Fixed Capital Investment.

In case of a Mega unit to which customized/special incentives are given, the quantum of monetary ceiling that may be allowed shall not exceeds 200 % of fixed capital investment. The benefit of tax reimbursement under the policy shall be subject to the condition that the unit after having availed of

[5] Industrial and Investment Policy of Assam, 2019 | Industries & Commerce | Government Of Assam, India

the benefit shall continue its production or operation at least for the next 5 (five) years not below 75% of the average production for the preceding 5 (five) years.

Other Incentives

Incentives from all these components shall not exceeds 100 % of the fixed capital investment. The overall ceiling does not include subsidy accruing to the unit from the SGST reimbursement.

Power Subsidy:

(i)Manufacturing and Specified Services sector units will be eligible for reimbursement of power subsidy @ Rs. 2.00 per unit consumed for a period of 5(five) years from the date of commercial production subject to a maximum Rs. 50 (fifty) lakhs Per Annum and not exceeding 100% of total investment made in plant & machinery, whichever is less.

(ii)Power subsidy shall be calculated on total unit consumed during the period at applicable rate per unit and will be exclusive of all other charges, viz. Load security, interest, taxes, etc.

Subsidy on generating set:

Subsidy on Generating set @ 50% of the cost subject to a limit of Rs. 20 lakhs on cost of generating set, taxes and transportation only. However, the capacity of the DG set should be equivalent to the power sanction to the unit by the competent authority.

Stamp Duty Reimbursement:

Stamp duty reimbursement shall be as follows:

(a) 100% Stamp duty shall be reimbursed, subject to a monetary ceiling of Rs.25 lakh (Twenty-five lakh).

(b) Stamp duty reimbursement shall not be available to agricultural land and its shall not also be available for land used in manufacturing activities in urban areas.

(c) Stamp duty reimbursement shall be available only for such parcel of land which is exclusively use for setting up of the manufacturing facilities or Hotel as specified in the Assam Industries (Tax Reimbursement for Eligible unit) scheme 2017.

Technology Transfer and Quality Certification, ZED Certification:

The fee payable for obtaining BIS/ISO/FSSAI/AGMARK/HALLMARK/SILK MARK/ZED Certification etc. and fee payable for getting technical knowhow/ Technology transfer from any recognized national /international research laboratories/ Technical Institutes/ University, Institutions like CFTRI, CIPET, etc. by eligible unit, will be provided subsidy up to the extent of 75%, subject to a ceiling of Rs.10.00 lakh per unit.

Interest Subsidy on Working Capital Loan:

2% on the outstanding working capital loan for five years subject to a ceiling of Rs. 50 lakh (Fifty lakh) and not exceeding 100% of investment in plant and machinery. Interest subsidy shall be available only on outstanding working capital loan availed from Bank/Financial Institution.

Financial assistance to MSMEs listed in Stock Exchange:

To encourage the MSMEs to be listed in BSE &NSE, Govt. will provide subsidy @ 30% of the cost of Public Issue expenses, subject to maximum of Rs. 5 lakhs.

Assistance for Environmental Compliance:

Subsidy @ 50% on capital cost for setting up of effluent treatment plant subject to max of Rs. 25 lakh per unit. This shall be not available for Hotel Industries.

Incentives to Private Sector Infrastructure developer:

It is proposed to provide 30% subsidy, excluding value of land, subject to a ceiling of Rs. 3 Cr to encourage the private investors in creation of industrial infrastructure where the land area is not below 30 acres. The amount shall be released to the developer only after completion of the project with 30% occupancy of the Industrial Park.

Special Incentive:

The State Government may provide special dispensation to the unit where the investment in fixed capital investment is above Rs.1000 Cr (One thousand crore) or generating a minimum of 2000 (two thousand) regular employment.

Incentives as per budget speech of 2019-20:

Over and above the GST incentive and other incentives given in the policy, the following incentives which were mentioned in the budget speech 2019-20, shall be a part of this policy.

(a) Incentives for employment generation, entrepreneurship:

To encourage employment of local youth in the industries, state Government will provide incentive of Rs.10000 (ten thousand) to the employer against each local youth employed by the unit. This shall be a onetime incentive to the industries.

The North East Industrial Development Scheme, 2017

(w.e.f 1/4/2017 for a period of five years)

1. Central Capital Investment subsidy @30% subject to a ceiling of Rs. 5 Cr

2. Central Interest Incentive on working capital @3% for a period of 5 years.

3.Reimbursement of 100% Insurance premium for a period of 5 years.

4. Reimbursement of CGST and IGST for a period of 5 years.

5. Income Tax reimbursement of first 5 years.

6.Transport Incentives

(a) Reimbursement of 20% cost of transportation through Railway.

(b) Reimbursement of 20% cost of Transportation through Inland waterways.

(c) Reimbursement of 33% cost of transportation through Air.

7. Additional 3.67 % of the employer's contribution towards EPF in addition to 8.33 % contribution made by GOI.

The total benefits from all the incentives put together shall be limited to the total investment in plant and machinery subject to a maximum limit of Rs.200 Cr.

The Export & Logistic Policy of Assam, 2019[6]

Objectives:

The objectives of the policy are:

a. to boost exports where Assam has competitive advantage through increased market penetration as well as to explore new markets for the products of Assam;

b. to enhance the ease of doing exports through creation of simple, effective and efficient institutional mechanisms, simplified processes and efficient organization and coordination with the stake holders;

c. to strengthen the export infrastructures of the state such as Inland Container Depots (ICDs), Border Trade Centres, Common Facility Centres, Integrated Cold Chain, Logistic Park, River ports and material handling facilities, Air Cargo facilities, quality testing labs, connectivity to ports, Integrated Cold Chain, etc;

d. to establish product specific parks like Tea Parks, Bamboo Parks, Food Park, Pharmaceutical parks, Plastic parks, etc;

e. to setup a branch of Indian Institute of Foreign Trade in the state;

f. to promote service sector exports by creating adequate infrastructure and training to utilize the state's large pool of available skilled human resources;

g. to promote frequent trade delegation, branding of Assam products, technology transfer, language learning institution, etc.;

h. to promote Assam's export to a higher trajectory with gainful employment; and

i. to support and transform small business and artisans through cross border e-commerce.

Focus Sectors:

[6] Export and Logistic Policy of Assam, 2019 | Industries & Commerce |Government Of Assam, India

Based on comparative advantage of the state in terms of resource endowments, and in line with the industrial base of the state, the focus sectors for exports from the state would include, among others, *Policy Period:*

The policy is valid for a period of 5 (five) years or till the date of declaration of new or revised policy.

Strategy & Measures:

With the objectives of the Policy, the state government would undertake requisite measures, which would include:

i. Infrastructural Support:

   a. The state shall encourage projects for development of exports undertaken under Trade Infrastructure & Exports Scheme (TIES) or any other central or State funded schemes.

   b. Setting up or upgradation of export related infrastructure and logistics like state-of-art Multi Modal Logistic Parks (MMLP), Logistic Park, Spices Park, Inland Container Depots (ICD), Container Freight Stations (CFS), Air Cargo Facilities, Common Facility Centres, Pack houses, Integrated Cold Chain facilities, Vapour Heat Treatment (VHT) facilities, Export Products exhibition Centre, Quality Testing Centres and Trade facilitation centres, product specific Industrial Parks, etc.

   c. Ensuring supply and availability of quality power, high speed internet, facility etc. at Land Customs Stations (LCSs) and other infrastructures created for Export & Logistic support.

   d. The state shall endeavour to improve the road connectivity to Border Trade Centres, LCSs, River ports, Industrial parks, railway stations etc. to easy access as well as to reduce the cost of transportation in a time bound manner.

   e. Improve the LCS Infrastructure. The State government shall encourage.

      a. Development of warehouses, cold storages needed for perishable and non-perishable products

      b. Modernization of existing terminals with increased number of entry points and separate lanes for perishable items,

      c. Provision of drinking water, toilets, ATMs, Banks and medical facilities, construction of shed for vehicles in the parking lots.

Creating Towns of Export Excellence (TEE): The State shall explore the possibility of identifying towns that could be notified as Town of Export Excellence (TEE) and pursue with DGFT for notification of such Towns, on the basis of their potential for growth in exports. This recognition will maximize their potential, enable them to move higher in the value chain and tap new markets.

Development of Quality management infrastructure: The state government shall endeavour to take the following measures towards stepping up quality and standards of the exports, with the assistance of various private partners, central institutions and departments:

a. Up-gradation of existing quality of products through more research& development, creation of Irradiation & Individual Quick Freezing (IQF) Facilities, and appointment of quality inspection Agencies.

b. Efforts to be made to tie-up with national laboratories like, NIFT, NID, CLRI, CFTRI, Indian Institute of Packaging, Phyto Sanitary Laboratory, Textile Lab, etc. to set up testing and certification infrastructure in the State.

c. Emphasis on opening up of accredited Testing labs closer to business centres / district centres to save time and cost.

Information dissemination: The Government shall make efforts to increase the availability and access of information regarding the existing infrastructure facilities for exporters to increase efficiency.

Incentives:

Assam state government provides the following subsidies/incentives for development of exports. Those are:

Capital Investment Subsidy:

Capital Investment subsidy in form of reimbursement for creation of export Infrastructure like Multi Model Logistic Park (MMLP), Logistic Park, Inland Container Depot (ICD), Container Freight Station (CFS), Air Cargo Facilities , Common Facility Centre , Pack house , Cold Storage , integrated Cold Chain facility , Irradiation facility , Individual Quick Freezing (IQF) facilities , Vapour Heat Treatment facilities , State of Art Quality Control Laboratory with NABL accreditation to support Export @ 30% of the eligible fixed capital Investment subject to a ceiling of Rs.10 (ten) Crore.

Capital Investment Subsidy for reefer vehicle, etc.

Capital investment subsidy in form of reimbursement shall be available for purchase of insulated, reefer transport/mobile pre cooling units @ 30% subject to a ceiling of Rs.1 (one) Crore.

Capital Subsidy for setting up of Primary Production Centres:

Capital subsidy in form of reimbursement shall be available for the setting up of Primary Processing Centre (PPC) for Agri-Horticulture produces @ 30% subject to a limit of Rs.1 (one) Crore.

Subsidy for obtaining Quality Certification:

Subsidy in form of reimbursement shall be available for obtaining Organic certification, Quality certification, ISO, ZED, etc @50 % subject to a ceiling of Rs. 50 (fifty) lakhs.

Freight Subsidy:

Freight Subsidy in form of reimbursement shall be available on Air freight from the Airport of Assam to Foreign destination for the Agro-Horticulture Products, Food Processing, Ornamental fishes, Floriculture products, Handicraft & Handloom products, Tea, Jute, Bamboo & other products based on locally available raw materials of the State @20% subject to a ceiling of Rs.50 Lakh only per

annum for a period of five years per unit. Industries engaged in products based on raw materials from outside the State shall not be eligible for Freight Subsidy.

WEST BENGAL

Summary and Flow of the Report

The total production in West Bengal is about 3.5 lakh MT in the year 2019-20. Out of that the total production in the district surveyed amounts to 3,1 lakh MT which accounts for about 90% of the total production in the state. The major varieties that are grown in the state include King and queen. King variety accounts for about 90% of the production.

Out of the total production about 80% is consumed through domestic markets, 10-15% exported to neighbouring countries and about 5% goes for processing in West Bengal. Again out of the 80% of domestically consumed pineapple, about 40% is consumed by other small scale units in India for processing.

Now looking at the infrastructure at each leg of the value chain, these are the major gaps that were found during the study along with **weightage by respondents** from the survey:

At farmer level-

- High cost of input materials and fertilizers **(90%)**
- Absence of scientific cultivation practices and training for the same **(75%)**
- Lack of access to irrigation facilities even if farms were in the vicinity of natural water sources **(75-80%)**
- Lack of knowledge of new schemes and incentives **(80-85%)**

At trader/aggregator level-

- Price escalation due to involvement of agents **(65%)**
- Farmers prefer farm gate selling rather than coming to the market **(85%)**
- Only can carry out business during peak seasons (2 months) **(75-80%)**
- Lack of proper storage facilities **(90%)**
- Nonscientific model of procurement by agents **(75%)**

At processor level-

- Lack of sorting and grading facilities in the vicinity of the production clusters **(60%)**
- Lack of specified collection points for procurement of pineapple which in turn increases cost of procurement **(85%)**
- Non availability of storage facilities in the vicinity of the production clusters **(80%)**
- Lack of availability of appropriate labor for harvesting and evacuation of the crop **(90%)**
- Lack of all-weather roads till the farm lands **(65-70%)**

Though previous industrial setup has had an effect on the varietal adoption by the farmers for processing, scattered production clusters and lack of support infrastructures such as washing, sorting, grading, transportation and lack of access to storage infrastructures are some of the major causes for disinterest of the industries.

Some of the specific recommendations in the report are:

- Setting up of primary processing units on PPP mode with interested food processing industries at cluster level (Darjeeling, Uttar Dinajpur, Jalpaiguri)

- Setting up of APEDA certified pack houses in Uttar Dinajpur and Darjeeling
- Mobile precooling units in each district
- Awareness drives on implementation of post-harvest techniques such as controlled ripening and waxing
- Provision of fruit pulper at district level
- Candied fruit production unit at Uttar Dinajpur and Darjeeling.
- Promotion and incentivisation of multi food processing techniques for existing food processing infrastructure in the state
- PET bottle packaging line at Uttar Dinajpur
- Setting up of packaging industry for raw produce as well as exports
- Establishing export hubs at production clusters like Darjeeling, Uttar Dinajpur and Jalpaiguri
- Reefer van and refrigerated containers
- Promotion and implementation of contract farming model in consultation with processing industries and exporters

Apart from these few other points which were evident from our discussion with the farmers which played a major hindrance was the high cost of input material and fertilizers. Lack of variety available by any government agencies forced them to grow only King variety through grafting method. Subsidisation of appropriate variety such as kew and king would be beneficial in order to increase the overall productivity thereby maintaining industry standards.

Another case based discussion with Laxmi Food Processing Unit (A pineapple processing unit from Darjeeling) revealed that there was no transport subsidy for them whereas similar subsidy scheme is present for the NER region. Being situated on a hilly terrain cost of transportation of both raw and processed material is a challenge for appropriate price realization. So such areas could be taken into consideration as a special case and transport related subsidy could be beneficial for them as well as for the future industry setups for pineapple and other commodities as well.

Approach & Methodology

The Assessment Study for Pineapple focuses on identifying gaps in infrastructure & processing facilities for development of potential value chains for perishable products under Operation Greens Scheme of MoFPI. The study has adopted both primary and secondary research tools. Preliminary research was based on detailed desk review of relevant secondary literature and interactions with relevant stakeholders during inception and subsequent stages. Primary research and assessment were based on the qualitative data/information that was collected through government official interactions as well as cluster/field visits and consultations with different stakeholders such as farmers, traders, processors, exporters etc. along with different enabling and institutional stakeholders.

Study Area

The following districts were taken into consideration for an in-depth study and gap analysis of pineapple value chain and their status of functioning which are prevalent in the state:

- Darjeeling
- Uttar Dinajpur
- Jalpaiguri

Stakeholder Consultation

The various participants covered during the primary/field level interactions included farmers, traders, small & medium scale processors and local retailers. Various discussions and consultations were carried out with Department of Agriculture, Horticulture, Industries etc. to get an overview of the prevailing situation pertaining to the status and gaps in the value chain. Suggestions were also noted from different department heads and other relevant stakeholders in order to successfully have an in depth understanding and deliver some constructive recommendations.

The identification of different focus groups and farmers was done in coordination and consultation with the district level officials which included District Agriculture Officer (DAO), District Horticulture Officer (DHO), Commodity Product Experts, Nodal Officers, Trainers and other opinion leaders at the cluster and village levels. Focus Group Discussions (FGD/s) were also carried out which covered some relevant topics like challenges in production, post-harvesting, storage, marketing, processing and other value-added services for the focus crop. Other information which included package of practices prevalent, cost of production, farm level value addition, primary processing facilities, access to market and logistics, access to processing facilities and barriers in the value addition process were also recorded.

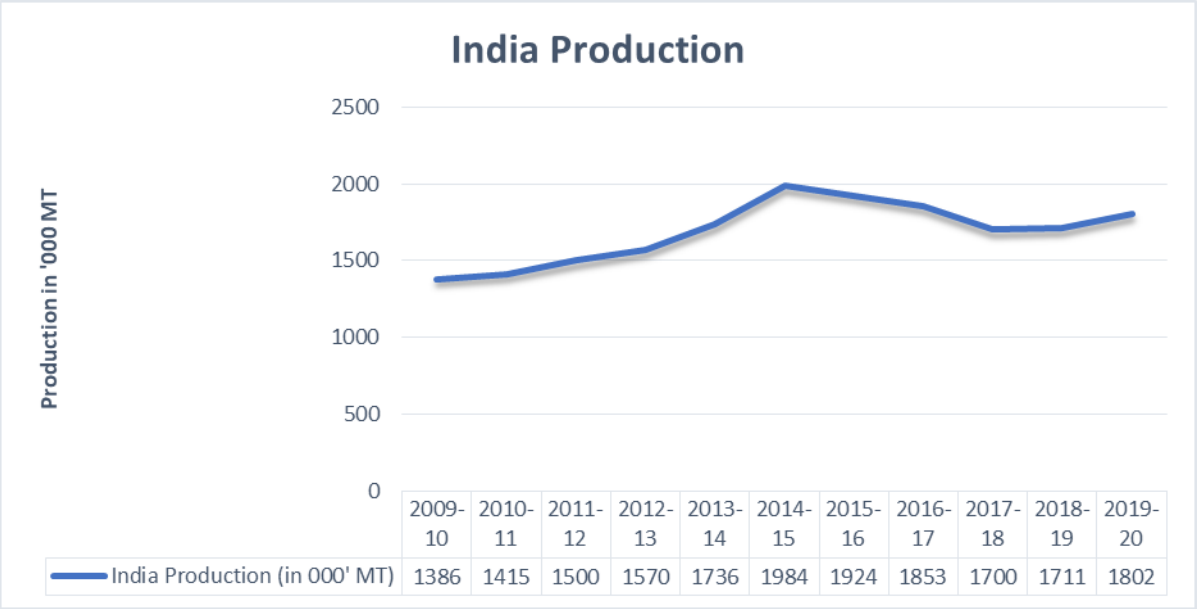
Stakeholders	*Key points of discussion*
Industry Mentor	Existing scope & challenges Present Status of industry Scope of Investment Financial grants/schemes availed (if any)

	Line of business Types of products/product line in which company is involved in Expectation from the study Suggestion (if any)
Farmers/FPOs/FPCs	Existing challenges and opportunities
	Access to finance
	Marketing and access to markets
	Food safety standards and requirements
	Grants or schemes availed
Processors/Traders	Existing challenges and opportunities
	Access to finance
	Marketing and entrepreneurial skills
	Access to information/knowledge
	Certification (Organic & Geographical recognition)
	Financial linkage and grants availed
District Officials	Sampling of clusters for primary research and evaluation
	District level support programs for small agri-food producers/processors
	Matching schemes and targeting mechanism
	Role of implementing agencies in districts if any
	Existing economic opportunities and existing market failures
	Prevalent schemes in the districts
	Secondary data collection
	Other challenges for the particular value chain
Statistical cell	Secondary data collection on production of commodities
State Officials/Directorates	Priority sectors and subsectors
	Discussion on ongoing and future programs
	Understanding the gaps between multiple support programs
	Secondary Data collection

Primary survey	
Stakeholders	***Number***
Farmer	124
Trader/Aggregator/Exporter	21
State/District Government Officials	7
FPO/FPC/SHG/Cooperatives	4
Transporter	18
Processing unit	01

Production in India

The total production of pineapple recorded by India in the year 2019-20 stands at 1802 thousand tones.



NHB Data, 2019-20

The above graph shows a gradual decline in production of pineapple following the year 2014-15. The reason as per the trend can be various factors, but the most crucial one of them would be decrease in area under cultivation for pineapple.

According to study and analysis, the region under the survey, especially the NER region contributes to approximately 40% of the total production of pineapple. Out of the total production from these areas approximately 90-95% of the production is organic in nature and cultivated through age old traditional cultivation practices.

State wise Production

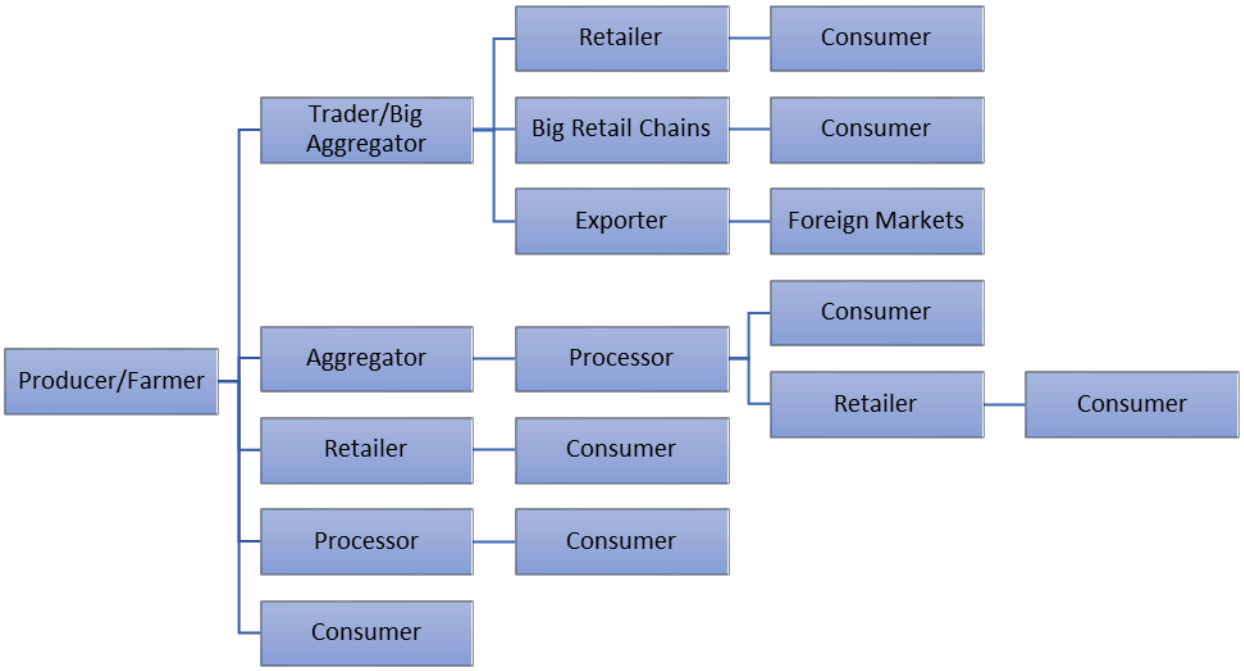
The table below shows the state wise production of pineapple in India.

Sl no.	State	2014-15		2015-16		2016-17		2017-18	
		Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)
1	West Bengal	320	16.13	330.06	17.15	336.11	18.13	345.15	20.3
2	Assam	281.27	14.18	285.17	14.82	268.92	14.51	296.52	17.44
3	Karnataka	156.31	7.88	155.41	8.08	164.26	8.86	163.73	9.63
4	Meghalaya	124.6	6.28	123.13	6.4	140.95	7.6	144.73	8.51
5	Manipur	136.75	6.89	128.51	6.68	127.03	6.85	134.11	7.89
6	Nagaland	142.5	7.18	127.81	6.64	132.62	7.15	132.83	7.81
7	Tripura	170.89	8.61	180.26	9.37	94.67	5.11	127	7.47

8	**Bihar**	116	5.85	116.3	6.04	116.58	6.29	115.13	6.77
9	**Andhra Pradesh**	35.96	1.81	55.38	2.88	64.41	3.47	71.33	4.2
10	**Kerala**	348.06	17.54	305.67	15.89	310.32	16.74	69.72	4.1

According to the previous table, West Bengal is one of the highest contributors towards pineapple production in India followed by Kerala and Assam respectively. West Bengal has 20.3% of total production share for pineapple in India.

The below mentioned diagram depicts the market channels prevalent in India for pineapple value chain.



West Bengal

West Bengal is the largest producer of pineapple in India. It also holds the second largest producer title for potato and litchi respectively. Post Indian independence, West Bengal's economy is based on agricultural production and small and medium-sized enterprises. Today, the economy of West Bengal is the sixth-largest state economy in India with a gross state domestic product (GSDP) of ₹12.54 lakh crore (US$180 billion) and has the country's 23rd-highest GSDP per capita of ₹115,748 (US$1,600).

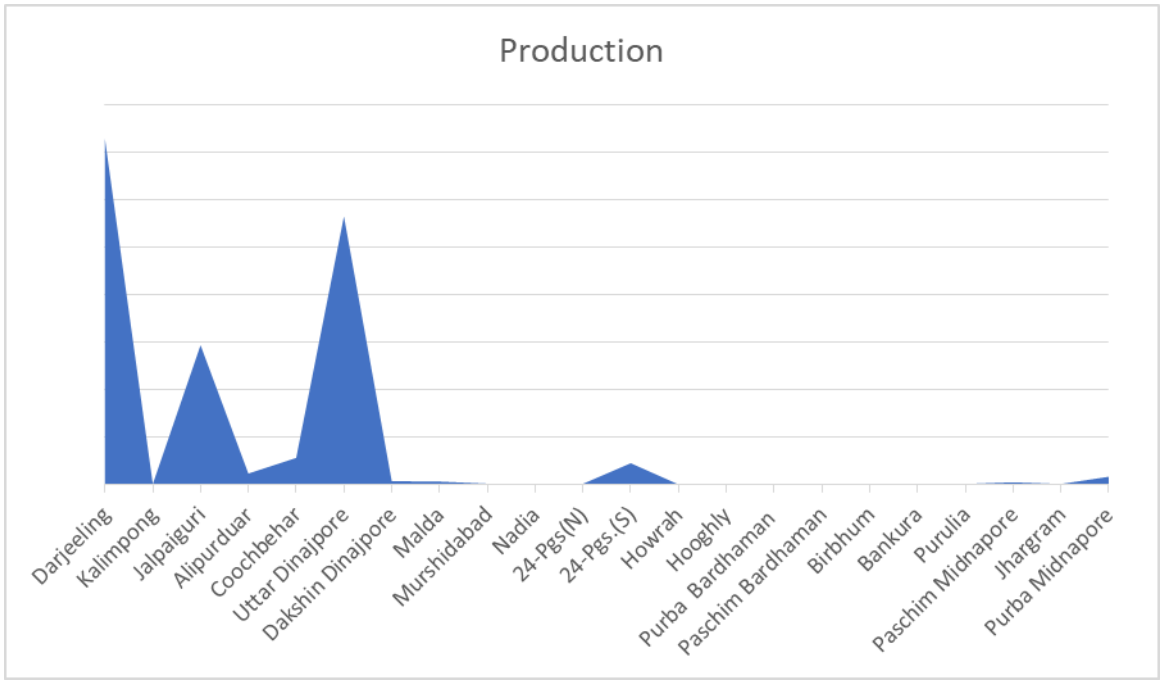
West Bengal is on the eastern bottleneck of India, stretching from the Himalayas in the north to the Bay of Bengal in the south. The state has a total area of 88,752 square kilometres (34,267 sq mi). The Darjeeling Himalayan hill region in the northern extreme of the state is a part of the eastern Himalayas Mountain range.

Pineapple Production in West Bengal

Sl. No.	Name of the District	Area (in 000' Hect)	Production (in 000' MT)	Productivity (in kg/hect)

1	**Darjeeling**	4.662	145.360	31179.75
2	**Kalimpong**	0.015	0.196	13066.66
3	**Jalpaiguri**	1.823	58.650	32172.24
4	**Alipurduar**	0.148	4.600	31081.08
5	**Coochbehar**	0.365	11.165	30589.04
6	**Uttar Dinajpore**	3.500	112.885	32252.85
7	**Dakshin Dinajpore**	0.068	1.395	20514.70
8	**Malda**	0.112	1.225	10937.50
9	**Murshidabad**	0.023	0.325	14130.43
10	**Nadia**	0.021	0.255	12142.85
11	**24-Pgs(N)**	0.047	0.275	5851.06
12	**24-Pgs.(S)**	0.400	8.956	22390
13	**Howrah**	0.001	0.012	12000
14	**Hooghly**	0.041	0.310	7560.97
15	**Purba Bardhaman**	0.040	0.351	8775
16	**Paschim Bardhaman**	0.000	0.000	0
17	**Birbhum**	0.003	0.038	12666.66
18	**Bankura**	0.015	0.105	7000
19	**Purulia**	0.018	0.210	11666.66
20	**Paschim Midnapore**	0.062	0.896	14451.61
21	**Jhargram**	0.015	0.185	12333.33
22	**Purba Midnapore**	0.257	3.256	12669.26
Total West Bengal:		**11.636**	**350.650**	**30134.92**

Source: Directorate of Horticulture, Data of 2019-20



District Wise Production & Trade Flow

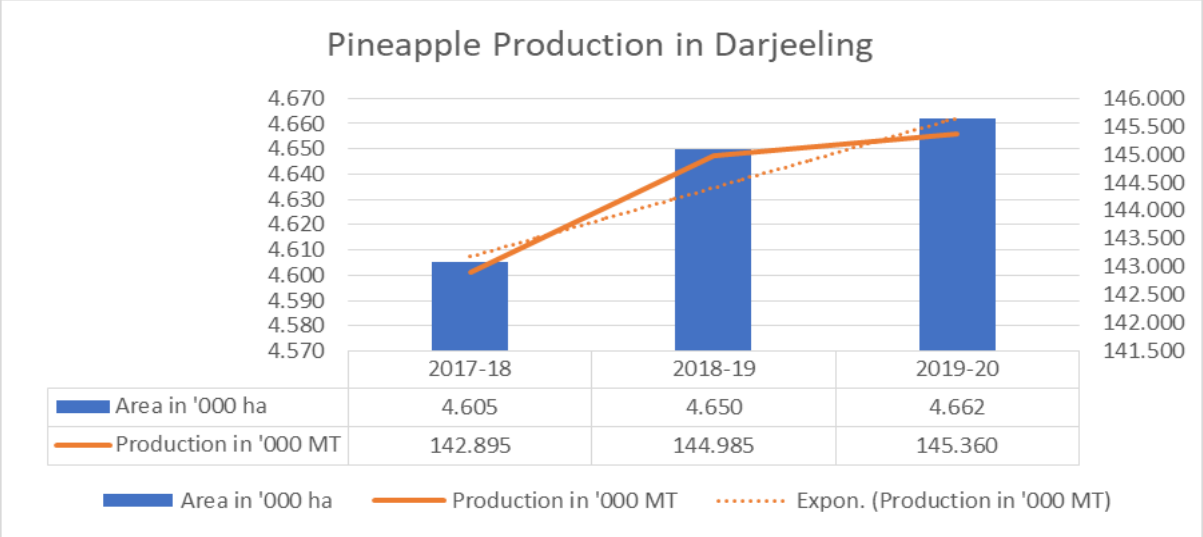
The major clusters which are part of the study are Darjeeling, Uttar Dinajpur and Jalpaiguri. These districts are the major contributors towards the quantum of production for pineapple in the state.

Darjeeling

Darjeeling is a city and a municipality in the the Indian state of West Bengal. It is located in the Lesser Himalayas at an elevation of 2,000 metres (6,560 ft). It is noted for its tea industry, its views of the world's third-highest mountain Kangchenjunga, and the Darjeeling Himalayan Railway, a UNESCO World Heritage Site. Darjeeling is the headquarters of the Darjeeling district which has a partially autonomous status called Gorkhaland Territorial Administration within the state of West Bengal. It is also a popular tourist destination in India.

Darjeeling is the main town of the Sadar subdivision and also the headquarters of the district. It is located at an elevation of 2,000 m (6,700 ft) in the Darjeeling Himalayan hill region on the Darjeeling-Jalapahar range that originates in the south from Ghum. The range is Y-shaped with the base resting at Katapahar and Jalapahar and two arms diverging north of the Observatory Hill. According to the Bureau of Indian Standards, the city falls under seismic zone-IV, (on a scale of I to V, in order of increasing proneness to earthquakes) near the convergent boundary of the Indian and the Eurasian tectonic plates and is subject to frequent earthquakes.

Darjeeling has a temperate climate and the average annual precipitation is 2,380 mm (94 in), with an average of 105 days of rain in a year.



Source: Directorate of Horticulture, Data of 2019-20

The above figure shows the production and area of pineapple cultivation in Darjeeling. The most cultivated variety. Though the varietal data was not readily available for the districts or the state, our survey concluded that King is the variety that has been preferred by most of the farmers here in Darjeeling.

Trade Flow

Channel 1 (70%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (15%)

Farmer➔Trader➔Big Retail Chains➔Consumer

Channel 3 (10%)

Farmer➔Aggregator➔Processor➔Consumer

Channel 4 (5%)

Farmer➔Processor➔Consumer

These were the most prevalent channels in the state. Most of the farmers preferred farm gate selling (85%) over selling directly at the market. The major reason being the labour-intensive harvesting owing to difficult terrains. Previous large processing setups which have closed down currently have changed the way farmers market their produce here in Darjeeling. The major regulated market place is at Siliguri and operated by Agri Mkt Dept (T&C) whereas there is also a wholesale market present at Bidhan Nagar.

The pineapple was available at about Rs 22-25/- per piece at the farm gate. However, that was only during high demands. The prevalent rates were normally between Rs 18-20/- per piece. Considering market places in Siliguri however these pineapples traded at around Rs 32-36/- per kg (Rs 3200/ quintal).

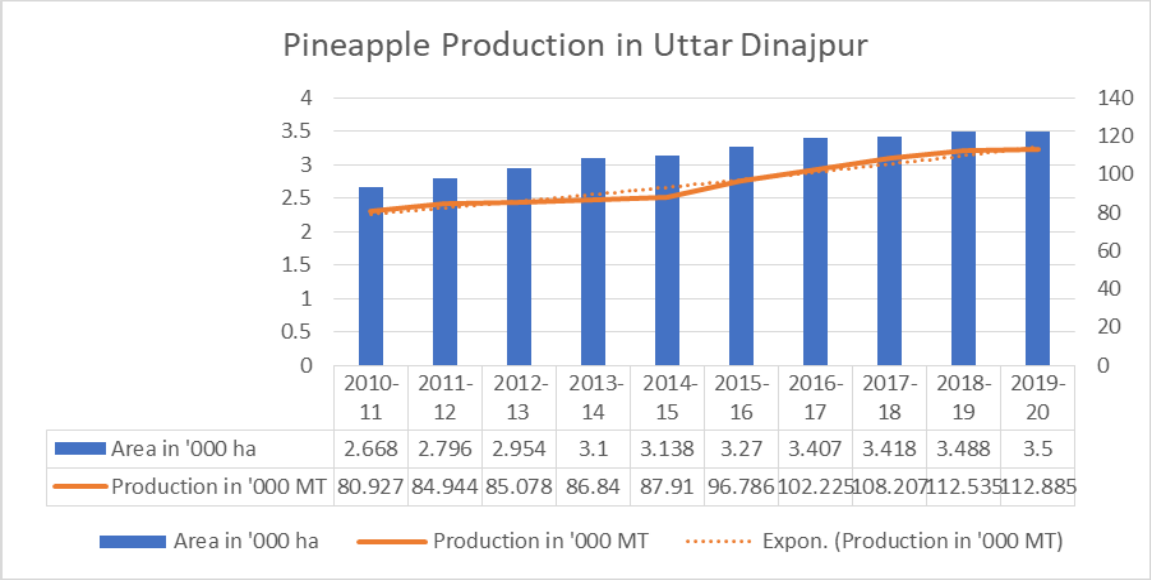
Uttar Dinajpur

In Uttar Dinajpur District there are 2 Sub-Divisions Raiganj & Islampur , 110Km apart from each other. District having International Border length of 206 km (approx) in the east with Bangladesh and in the west 227 Km. borders with Bihar. There are 4 Municipalities, 9 Blocks and 98 Panchayats covering 1494 villages. The total population is nearly 30 Lakh comprising mainly of rural masses. Bengali is the main language but a sizeable portion of Urdu and Hindi speaking people live in Islampur Sub-Division.

The Climate of this district is characterised by Hot-Summer with High Humidity, abundant Rainfall and Cold Winter. The Summer begins from April. Monsoon starts from June and lasts till September. December and January are the coldest months.

In 2006 the Ministry of Panchayati Raj named Uttar Dinajpur one of the country's 250 most backward districts (out of a total of 640). It is one of the eleven districts in West Bengal currently receiving funds from the Backward Regions Grant Fund Programme (BRGF), but now Dalkhola the main commercial, business town with well-connected railway and roadways. increasing the economy of Dalkhola and Uttar Dinajpur District.

Major railway stations are Raiganj(RGJ), Radhikapur (RDP), Kaliyagunj, Dalkolha and Aluabari Road Jn (Islampur). Dalkolha is most important stoppage of long-distance train. NH 27 and NH 12 are two National Highways in this District.



Source: Directorate of Horticulture, Data of 2019-20

The above graph shows the production and area under pineapple cultivation in the district. Uttar Dinajpur currently has 1 FPO that is currently involved in pineapple value chain. The major MSMEs present in the district include focus items like wooden furniture, paper products, leather, chemical, mineral metal and other electrical machinery and transport equipment.

Trade Flow

Channel 1 (85%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (10%)

Farmer➔Retailer➔Consumer

Channel 3 (5%)

Farmer➔Consumer

During the survey, it was observed that most of the farmers only sold their produce to the agents as they considered it eases out the cost related to transportation and other related losses. Though this was the major reason they had a low-price realization for their produce. The major regulated market in Uttar Dinajpur is Islampur principal market yard. Though there was a negligible quantum of pineapple traded from the market other products such as maize, paddy, potato, wheat and mustard seeds dominated the market trade.

The farm gate prices were Rs 18-20/- per kg or per piece if it weighs less than 1250 gm depending on the quantum of trade. Majority of the pineapple finds its way to Kolkata fresh fruits market.

Jalpaiguri

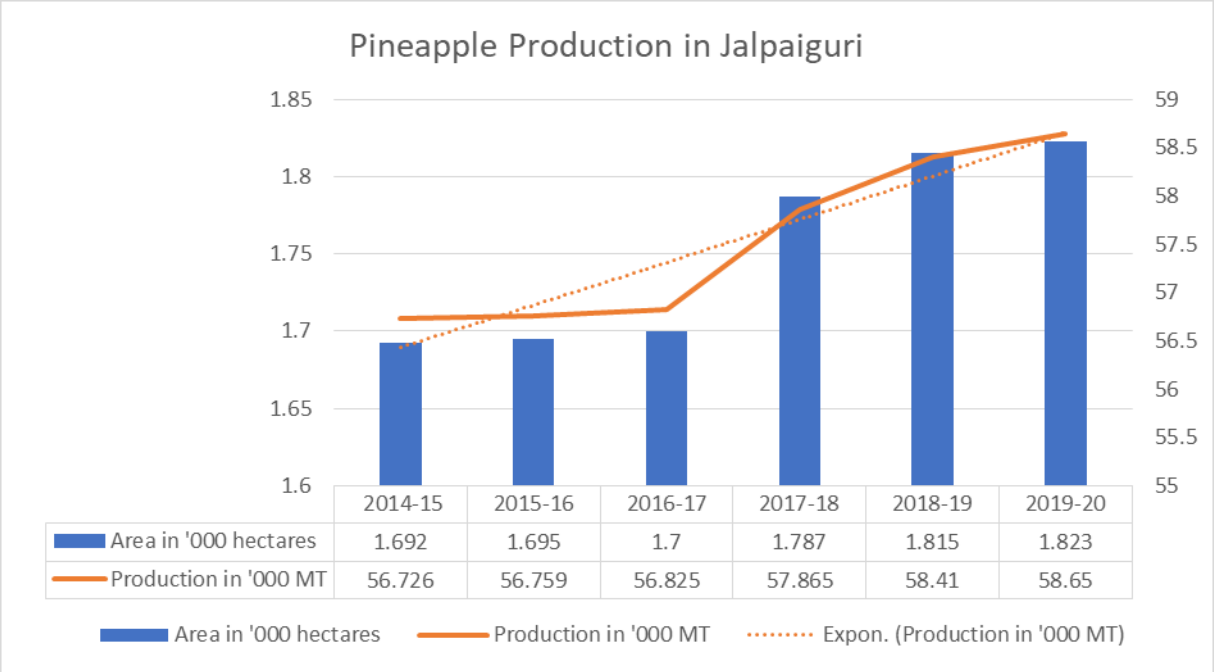
Jalpaiguri is a city in the Indian state of West Bengal. It is the headquarters of the Jalpaiguri district as well as of the Jalpaiguri division of West Bengal, covering the jurisdiction of the five districts of North Bengal. The city is located on the banks of the Teesta River which is the second largest river in West Bengal after the Ganges, on the foothills of the Himalayas. It lies 35 km east of its twin city,

Siliguri. The merging of the two cities makes it the largest metropolis of the region. Jalpaiguri is the district headquarter of Jalpaiguri District. It is situated at a height of 89m from Mean Sea Level.

The annual average temperature of Jalpaiguri city is 24.8 °C. In summer, the temperature varies from a minimum of 20-22 °C to a maximum of 28-34 °C. August is the hottest month with an average temperature of 29.1 °C. The temperature in July, August sometimes exceeds 35 °C. The highest temperature ever recorded in Jalpaiguri was 41 °C, was recorded on 13 August 2019. The winter maximum temperature here hovers around 22-25 °C and minimum drops 8-12 °C. The minimum temperature sometimes falls below 7 °C. As Jalpaiguri is located on the base of the Himalayas, the city receives a high amount of rainfall throughout the year. The average annual rainfall is approximately 3400 mm. A distinct season, monsoon is observed from June to September. About 965.7 mm rain falls in July. Though the amount plummets to 6.6 mm in December.

Jalpaiguri city region has four important railway stations: -

1. Jalpaiguri Town is the oldest station in the area.
2. Jalpaiguri Road was opened in 1944 and is the primarily crucial railway station of the city.
3. Mohitnagar lies at Mohitnagar in the Haldibari-New Jalpaiguri line.
4. Raninagar Jalpaiguri Junction is situated at the further western part of the city. The railway station serves Jalpaiguri, Raninagar and other nearby places.



	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Area in '000 hectares	1.692	1.695	1.7	1.787	1.815	1.823
Production in '000 MT	56.726	56.759	56.825	57.865	58.41	58.65

Source: Directorate of Horticulture, Data of 2019-20

The above graph shows the area and production for pineapple cultivation in Jalpaiguri. As per the above graph the exponential trend line shows a positive curve especially after 2016-17. It has been observed that the district has a lot of scope in terms of pineapple production given the strategic location and infrastructure. Recent production has been affected due to sun burns and other spot diseases. As there is no awareness on these diseases and their prevention, they are currently facing huge loss even during the production. The farmers are forced to throw away most of their produce owing to this particular problem.

Trade Flow

Channel 1 (70%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (20%)

Farmer➔Aggregator➔Processor➔Consumer

Channel 3 (7%)

Farmer➔Retailer➔Consumer

Channel 4 (3%)

Farmer➔Processor➔Consumer

The above are some of the most prevalent marketing channels that are found in the district. Similar to the above two districts here also the farmers/producers preferred farm gate selling rather than going to the market for pineapple. Though here it was seen that farmers often are observed involved in other labour activities other than farming.

The farm gate prices as observed in Jalpaiguri are quite low as compared to other pineapple producing districts. During our survey, the farm gate prices hovered around Rs 8-10/- for 1250 gm pieces and Rs 12 for 1500 gm pieces. Rs 12/- was the highest price received during the survey.

Infrastructural Assessment & Gaps

Now the following study will talk about infrastructure, the way it is existing at each leg of the value chain and major identified gaps found thereof. It will be followed by recommendations to improve the functioning of overall value chain and make it economically viable and attract investments for the value chain and the sector as a whole.

Producer/Farmer

Average land holding of the farmers involved in pineapple production in the state was 1.2 hectares. Most of the farmers here owned small patches of land. 20% of the farmers had leased land with a lease period of 6-10 years. About 90 % of the respondents shared that Kew and King were the most grown variety in West Bengal.

As most of the production scenarios were similar for West Bengal and Assam, West Bengal has got advantage of number of markets. High cost of fertilizers was one of the major issues pointed out during initial farmer interactions. King is one of the major varieties that is available in the state.

Farmers here are still practicing decade back traditional cropping techniques which are obsolete and they seem disinterested in taking up new techniques thinking this would involve usage of harmful chemical fertilizers and in turn damage the productivity of the soil in the long run.

Farmers also faced issues related to irrigation though some of the farms were just in the vicinity of Chenga River in Darjeeling.

Primary Processor

Absence of sorting and grading facilities at primary level was one of the biggest hindrances. This is one of the major challenges faced by some institutional buyers and traders who demand product quality according to specified standard, colour and size.

Non availability of storage facilities also contributes to the post-harvest losses of the produce. Though some cold storages are available near Howrah and Hooghly, the distance from the production clusters plays hindrance in the usability of the same by the farmers in Darjeeling, Uttar Dinajpur and Jalpaiguri.

Adding to that another major hindrance is the lack of appropriate labour to harvest and evacuate the fruit from the farms. It was often seen that most of the farm lands were connected through kutcha road which discourages different transporters.

Trader/Aggregator/Exporter

The major marketing cluster for pineapple in West Bengal is Siliguri (Darjeeling). The prices of pineapple usually hover around +/- Rs 34/- per kg or Rs 3400/- per quintal. During COVID19 lockdowns the rates and sale of pineapple and other crops were hugely affected. Some of the regular producers and traders who used to sell pineapple in the markets were seen shifting to other modes of business. The nearby markets include Assam and Tripura from which pineapples generally find its way to West Bengal.

Most of the traders here sold the fruits to markets in other states and countries. The major sale destinations are:

Slno	Major Markets	Percentage sales	Ripened/Non-Ripened
1	Nepal	10%/20%	Non ripened/Ripened
2	Uttar Pradesh	30%	Non-Ripened
3	Delhi	30%	Non-Ripened
4	Bihar	10%/15%	Non-Ripened/Ripened
5	Punjab	5%	Non-Ripened
6	West Bengal	15%/70%	Non ripened/Ripened

All the above figures have been derived from field study and in consultation with traders from the market.

Traders here generally faced price escalation issue when they procured the product from different agents. In terms of marketing of pineapple, the major challenge faced by the farmers and traders alike as of now is the involvement of too many agents who contribute to price escalation (Rs 2500/10-ton truck load) of the raw material procured by the industrial buyers/big traders. About 85% of the farmers here preferred farm gate selling as it would take away the headache of disposing off the produce. But in turn farmers face the loss related to pricing of the produce.

It was often seen that there is a visible seasonal effect (available for 2 months) on the availability of quality pineapples in the market. This may be related to the absence of storage facilities in the vicinity of the production clusters.

Most of the buyers/agents who procure pineapple from the farms/orchards generally didn't follow any scientific pricing methods and fixed prices upon visual inspection only. This in turn somehow gradually affected the overall production of quality pineapples by the producers. Farmers seldom have any bargaining power over the prices fixed by these agents who procure in bulk.

Most of the pineapple finds its way to Nepal through Kakarbhitta via road. As mentioned above about 30% of pineapple is exported annually via this route. Other than that there is a potential market at Bangladesh, but it was learnt that most of the produce (approx. 75-80%) is traded at Delhi and then exported to neighbouring countries like Nepal and Bangladesh.

Transportation and Logistical Service Provider

Transportation is one of the strongest infrastructures that West Bengal has currently and also has got scope of expansion looking at the strategic location of the state. Now though the logistical presence is there for most of the valued goods, for pineapple owing to quantum of produce from the clusters it was observed that most of the transporters were not interested to deal with consignment owing to the road conditions to the clusters. As pineapple harvesting is seasonal and the harvesting is dome during monsoons, most of the hilly areas and access roads are either submerged or pose as a barrier to establish logistical movement on time.

Netaji Subhas Chandra Bose International Airport at Dum Dum, Kolkata, is the state's largest airport. Bagdogra Airport near Siliguri is a customs airport that offers international service to Bhutan and Thailand, besides regular domestic service. Kazi Nazrul Islam Airport, India's first private sector airport, serves the twin cities of Asansol-Durgapur at Andal, Paschim Bardhaman.

Kolkata is a major river port in eastern India. The Kolkata Port Trust manages the Kolkata and the Haldia docks. There is passenger service to Port Blair on the Andaman and Nicobar Islands. Cargo ship service operates to ports in India and abroad, operated by the Shipping Corporation of India.

Now in terms of railways, as of 2011, the total railway route length was around 4,481 km. Kolkata is the headquarters of three zones of the Indian Railways—Eastern Railway and South Eastern Railway and the Kolkata Metro.

Following is the list of kisan rails that are currently connected to the state.

Kisan Rail[7]

Sl no.	From - To	Date of Inauguration	Frequency	No of trips	Loading(Tonnes)	Revenue(Rs, in lakhs)
1	Chhindwara toHowrah/ New Tinsukia	28-Oct-20	As per demand	3	624	11.2
2	Sangola to Howrah(via Secunderabad)	29-Oct-20	*discontinued*	20	1,881	90.8
3	Sangola to Shalimar	21-Nov-20	Bi-weekly	57	17,702	761.5
4	Nagarsol to New Jalpaiguri	10-Jan-21	As per demand	4	2,039	96.6
5	Nagarsol to Malda Town	20-Jan-21	As per demand	10	2,696	122.7
6	Yeola to New Jalpaiguri	30-Jan-21	As per demand	2	952	44.9
7	Nagarsol to Dhupguri	3-Feb-21	As per demand	2	1,014	49.3
8	Nagarsol to Gour Malda	4-Feb-21	As per demand	27	7,570	346.9
9	Warangal to Barasat	9-Feb-21	As per demand	1	210	9.0
10	Nagarsol to Sankrail	11-Feb-21	As per demand	8	2,996	129.9
11	Nagarsol to Dankuni	10-Mar-21	As per demand	2	472	20.7
12	Yeola to Gaur Malda	27-Mar-21	As per demand	3	674	30.9
13	Kopargaon to Gaur Malda	12-Apr-21	As per demand	1	236	10.8
14	Lasalgaon to Gaur Malda	3-May-21	As per demand	8	1,672	76.3
15	Niphad to Gaur Malda	10-May-21	As per demand	1	196	9.0

The above data shows the current status of Kisan rail and its efficacy. However, pineapple as a crop was not preferred by the traders/farmers to be sent via this owing to the frequency of the movement of trains during harvesting season.

Processor

In the state of West Bengal, the rapidly increasing production of vegetables and foods has created a vast potential for food processing industries. The state government of West Bengal has also been developing infrastructure for tapping the potential for food processing industries in the state. Despite all these, when we look at the Annual Survey of Industries data, agro-industry does not

[7] www.irctchelp.in

appear to be the dominant constituent of the industrial sector of West Bengal. The strength of agro-based industry in West Bengal is comparatively less than those of non-agro-based industries.[8]

Some interactions with the farmers and industry stakeholders revealed that during previous processing unit's setup such as Dabur, the units failed miserably and had to shut down. The major reason as shared by the respondents was the lack of standardisation of quality of the pineapple and scattered production. The major challenges as perceived from interactions from the value players for the industries were lack of continuous raw material availability which in turn also increased cost of operations.

Below mentioned are the secondary processing units that are operational for pineapple in the state:

SL No.	Name of the Processing Center	District	Address	Contact Person	Mobile No.	Product	Quantum of pineapple consumption per annum
1	ABCON Food	Nadia	Par Majdia, Nabadwip, Nadia	Bimal Banerjee	9733672425	Jam	7-8 MT
2	Herald Food Products	S 24 PGNS	Bishnupur, S 24 PGNS	Mr. Banerjee	9831153700	Jam, Squash and Juice	10 MT
3	Poddar Food Products	Coochbehar	Chakchaka, Coochbehar	Subrata Poddar	9933636287	Jam	6-8 MT
4	Laxmi Food Processing	Darjeeling	Lopchu, Darjeeling	Vivek Jain	8942845192	Jam, Squash, Juice	6 MT

The total yearly consumption by the above units is merely 35-40 tons. So it is evident that there is a huge scope of processing provided the quantum of consumption. Some of the units mentioned above are also involved in exports of processed products as well as fresh products.

Case of Laxmi Fruit Processing, Lopchu Bazar, Darjeeling

There is only one operational Secondary Processing Centre for fruit and vegetable processing in the 3 districts covered in the survey and that is Laxmi Fruit Processing located at 10th Mile, Lopchu Bazar, Darjeeling - 734 213. This is a MSME unit owned by Mr. Vivek Jain and Mr. Shiva Jain.

Laxmi Processing Centre is into juice making of lichi, orange, pineapple, passion squash and sweet mango squash. They also are into jam making but that is in small quantities. Their main product is Chilli Fireball Pickle.

The respondent shared that 60% of raw material (read pineapple) is procured directly from farmers and the rest 40% procurement is done from traders. The major procurement season is mainly during June / July and most of the raw material procured is converted into pulp in large quantities and stored for processing in the lean period.

Out of 3000 litres of juice produced in a week, around 500 litres are pineapple juice, rest are of other fruits. So, ideally only once a week pineapple juice is prepared.

On a similar basis, monthly around 100 to 150 kgs of pineapple is converted to jam and stored in a glass container. Around 10 to 15% of pineapple is converted to jam and the rest 85 to 90% into pineapple juice.

[8] http://www.visvabharati.ac.in/file/Final-Report-159.pdf

The company exports around 1 MT (1000 kgs) of pineapple jam (not pineapple juice) to Nepal and Bhutan.

Pineapple juice is transported mainly to Delhi, Himachal Pradesh and Assam, each around 1 MT (total 3 MT). The consumption in West Bengal is about 2 MT.

Gaps in terms of demand and supply of products -

There is a consistent demand for their products throughout the year but unfortunately their production capacity is limited. For example, despite the increasing demand, the company's capacity for pineapple products is around 6 MT annually.

Since, there is large demand, the company envisaged a future expansion plan to substantiate this demand. They got in touch with Mr. Abhijit, Director of MSME, DIC and subsequently a 3-crore loan was approved for expansion / upgradation of plant and machinery. But, due to the COVID 19 pandemic they had to forego the loan and the expansion plans are on hold.

No access to Freight / transport subsidy -

According to Mr. Vivek Jain, the company is burdened by the high transport costs since they are located in hilly areas. There is a freight subsidy scheme for North Eastern States *(North Eastern Industrial Development Scheme)* to take care of the high transport costs in the hilly regions. But as Darjeeling doesn't come under the said scheme, they are deprived of the benefits even if they are on a hilly region. They also are not able to enjoy any subsidies related to machinery and building of factory sheds.

Recommendations

Considering the above assessment of the overall value chain and infrastructure capabilities, major gaps were found with the production and continuous supply of raw materials to the industries. So it was observed that rather than only uplifting the existing processing, a holistic development needs to be done in terms of other infrastructures as well. Only with such substantial changes, both trade and processing would take a significant leap.

The following are some of the recommendations that are made accordingly, highlighting suggestions at each leg of the value chain.

Primary Processing

Introduction of primary processing units such as washing, cleaning and grading at cluster levels if introduced at major production clusters would help in overall value addition to the products and make the institutional buyers more interested in procuring from these clusters. These units can be setup by the government as pilot project and handed over to some SHGs/NGOs with credibility to run the same.

Post-harvest techniques such as controlled ripening, proper storage of the fruits at appropriate temperature and waxing of the fruit in order to make them durable would also contribute towards minimising post-harvest losses.

Multi product processing units are the need of the hour. Though there are a number of food processing units in West Bengal, their engagement in a single product contributes to underutilization of the capacity of the firm. Therefore, to increase the efficiency as well as to streamline the market of processed product, promotion of multi-product processing technologies within the existing industry becomes a necessity.

Apart from the above, packaging infrastructure would also play a major role in packaging of the raw produce as well as processed products.

Marketing

Promotion of more direct marketing models by farmers would highly be beneficial both for the institutional buyers/industries as well as the farmers as this would encourage quality production and better price realization like kisan mandis. This model would need high amount of monitoring and supervision.

Promotion and implementation of contract farming models for pineapple needs to scale up owing to the quantum of production in the cluster in West Bengal. This would provide the farmers the surety of the market and for industries would be assurance on the continuous availability of raw materials.

FPOs/SHGs/Cooperatives and industries need to work hand in hand and for that proper forward and backward linkages needs to be established. The groups would be responsible for ensuring quality standard, collection of the produce and primary processing activities and then send the produce to the processing industries for secondary processing.

Establishing export hubs at production clusters like Darjeeling, Uttar Dinajpur and Jalpaiguri would promote the export related along with opening market opportunities for other nations.

Processing

Standardisation of quality of the fruit can only be ensured if proper incentives can be received by the farmers owing to making the right standard variety and quality available.

Now according to the above case on Darjeeling it was seen that the major hindrance is the cost of transportation owing to the hilly terrain. Steps can be taking to merge such hilly regions under the transportation subsidy scheme to encourage the industries to carry out the business and bring more investors to the region.

Context & Interventions

Considering pineapple, the following are the major issues that came up during the assessment for West Bengal:

The pineapple harvesting season in West Bengal starts from April and goes on till December. The typical harvesting practices include evacuating manually from the orchards. As harvesting of pineapple is a labor-intensive activity, farmers in the districts generally harvest the fruits in groups. This gives them leverage on the quantum of fruits collected from each orchard. The fruit is collected in a basket made of bamboo and then evacuated from the fields similar to Assam. The approximate losses as reported by the farmers ranged from 2-3% at the farm level evacuation.

Considering transportation, the major problem is with the availability of last mile connectivity of roads till the farms and lack of all-weather roads. But we are not considering any interventions for the same here. Because of the above road conditions, the time taken for the produce to be transported from districts like Darjeeling and Jalpaiguri to major market places such as Kolkata sometimes take around 10-15 hrs and more during monsoons (Peak Harvesting). During such transit, majority of the produce (5-10%) gets damaged, adds up to the overall loss in the commodity flow. The peak harvesting happens during monsoons which makes the transportation even more difficult. During such seasons the vehicles get stranded some times for 1-2 days, which in turn adds up to the damage of the fruit and transportation related losses. Lack of transport subsidy for the region also adds up to the operational expenses.

Similarly considering marketing of the produce, the farmers mostly prefer farm gate selling. Most of the traders and aggregators go to the farm gate to collect the produce and fix the price solely on visual inspection. Absence of any sorting or grading facilities at block or district level, forces the farmers to sell their produce as a lot and mostly at a very low price (Rs 8-10/-) especially during peak harvesting. Farmers in Darjeeling however preferred selling the produce at the local markets and it was often seen that most of the traders from nearby states like Odisha also procured from the haats.

Processing of pineapple in West Bengal is still at a very nascent stage. Some small-scale units as mentioned, though are involved in some amount of processing, the total quantum of pineapple processing doesn't exceed 35-40 MT per year from the state. Most of the pineapple is consumed as fresh fruit in the state and the rest finds its market through aggregators and traders to other nearby states and countries such as Nepal, Bhutan and Bangladesh. The markets in Siliguri and Kolkata also cater to pineapple from states like Assam, Meghalaya and Tripura. In terms of variety, king is mostly

available in the clusters. If we take the whole cluster in to consideration including Darjeeling, Uttar Dinajpur and Jalpaiguri, majority of the products processed include Squash, Jam and Juice. Though West Bengal had a history of some of the large food processing units, all of them have been closed down gradually owing to lack of proper transportation and lack of standardized quality of raw materials for processing.

The above gaps are calling for interventions in the form of cold storages, driers, reefer vans, primary processing/minimal processing units and secondary processing units. Other than the above which are mostly infrastructure related, there are other gaps that needs to be addressed in order to facilitate effective use of infrastructure. Both types of initiatives need to go hand in hand.

Districts	Recommendation with indicative units	Why are we making the recommendation	How implementable is this recommendation	Indicative Costing (in Lakh x unit)	Investment Interest	Remarks
• **Uttar Dinajpur** • **Darjeeling**	APEDA certified Integrated Packhouse 1 TPD capacity – 1 in each district	• Currently there are no packhouses available in the vicinity catering to pineapple	Long Term(5 years)	50 x2 = 100	Large industries, HNI individuals and Warehouses	In terms of investment interest, most of the stakeholder demanded the need of Packhouses but the small processing units have suggested a PPP mode of implementation.
• **Darjeeling** • **Uttar Dinajpur** • **Jalpaiguri**	Mobile Pre-cooling Units – 1 in each district	• As evacuation and transport linkage takes time, precooling would reduce losses	Short Term	25 x 3 = 75	FPOs, Cooperatives and District administration	During the survey though some of the FPOs were interest in new technology adoption, lack of funds and COVID related losses have given them a setback
• **Darjeeling** • **Uttar Dinajpur**	Farm level sorting and grading facilities – 1MT/hr (5 per district)	• Currently no such infrastructure exists at the farm level • Owing to the quality of produce, these units would help in standardizing price according to grades	Short Term	15 x 10 = 150	FPOs, Groups and Small industries	Interaction with different groups, official and industry mentor revealed the interest of different unregistered and registered group of farmer who wanted sorting and grading infrastructure to be present at farm level.
• **Darjeeling** • **Uttar Dinajp**	Fruit pulper (100 kg/h) to be provided at district level	• Pulping is one of the techniques to increase	Short Term	0.79 x 50 =39.5	Individual big farmers, FPOs and Cooperatives	Rather than a business proposition, availability of

• **ur** • **Jalpaiguri**	groups or FPOS. (Minimum 50 no.s to be provisioned including all the districts)	shelf life of the commodity and make it processing ready • Pulping would help in long term utilization as a raw material for industries				fruit pulper is a necessity in the cluster owing to unavailability of on time transport facilities and transit related losses. Pulping would improve price realization and ensure continuous raw material availability for the industries. FPOs and other unregistered groups have shown interest in the intervention.
• **Uttar Dinajpur** • **Darjeeling**	Candied fruit production line – 1 TPD (1 in each district)	• The districts have large quantum of production • Pineapple candy is known to have a good shelf life and international market demand	Short Term	43 x 2 = 86	MSMEs, Institutional Investors, Large Industries	As presently pineapple processing is nonexistent in Uttar Dinajpur and only one exists in Darjeeling, none of them produce candied products for pineapple. Although most of the pineapple grown here is traded as fresh fruit candy processing has got huge scope both in domestic and international markets.
• **Uttar Dinajpur** • **Darjeeling**	Juice Processing Plant – 500 LPH (1 in each district)	• Both the districts have production of more than 100 MTs each • Huge potential of juice making • Only one processing plant is present in the cluster studied at Darjeeling	Short Term	26 x 2 = 52	Individuals, MSMEs, Institutional Investors, Large Industries	Juice processing for pineapple has recently grabbed attention for many individuals and MSME units. COVID related restrictions though barred them from setting up similar setups as learnt from different traders and aggregators, they are prepared to setup small

						scale juice processing if they get appropriate subsidy and facilitation
• **Uttar Dinajpur**	PET bottle packaging line – 500 LPH with Preprocessing section (1 in Uttar Dinajpur)	• No such infrastructure present in the clusters • Bottling would make the products immediately marketable and exportable	Long Term(5 years)	975 x 1 = 975	Large Industries	Recently post COVID some of the large industries have shown interest in setting up processing infrastructure. So considering the vicinity of other pineapple clusters such as Assam, Meghalaya, Shillong and Tripura the state is conducive and has received investment interest for pineapple processing as well as other fruits.
• **Darjeeling** • **Uttar Dinajpur** • **Jalpaiguri**	Reefer vans 1600 kg to be provided at district level (5 for each district)	• As pineapple is grown on hilly terrains evacuation and transportation availability become difficult • Currently transported through mini vans	Short Term	3.60 x 10 = 36	FPOs, Big Farmers, Transporters, MSME and state government	As temperature controlled environment in transportation of the commodity plays a major role towards avoiding transit related losses, many transporters and FPOs have shown interest towards investment in the same
• **Darjeeling** • **Uttar Dinajpur**	Refrigerated containers 10-20 tons capacity to be provided at district level (2 for each district)	For long distances open trucks are used which expose the pineapples to harsh weather conditions and most of the fruits get damaged or become unfit for consumption	Long term	8.00 x 4 = 32	Transporters, Big Traders and Processing Units	Processing units and logistical service providers have shown interest in investing but at a later stage preferably after 2-3 years.
Total Cost of Intervention (Indicative)				**1545.5**		

Hence the total indicative cost of intervention comes to Rs 15.45 crores for the cluster which include Darjeeling, Uttar Dinajpur and Jalpaiguri.

Now considering the above interventions, there are multiple investors those who were keen to invest in small scale processing if subsidies related to setting up of the units as well as subsidy on transport will be provided. These investors include FPOs and MSME units in the state. Apart from that there are large industries that are willing to invest in setting up infrastructure in the state as well as invest in logistics. Some of the FPOs and MSMEs had also planned for investments but due to COVID19 lockdown they had to minimise their operations for a while and had to bear related costs. However the above recommendations were made based on the field interactions as well as analysis according to the nature and scope of setting up of such infrastructure.

Interactions

Meeting with State Government Departments

Shri. Jayanta Kumar Aikat, IAS, Commissioner, FPI&H Department, Director, Food Processing Industries and OSD &EO Director Horticulture

Had a meeting on 13th July and subsequent meetings and interactions and got to know about the present processing and production infrastructure of pineapple in West Bengal. Various processing units were shut down in the past and farmers gradually lost interest in commercial cultivation of the crop. Considering processing of pineapple currently there are no large-scale processing units in the state. Most of the produce are traded in the market in fresh fruit format. We were also informed about some of the smaller processing units currently working in the state. We have tried and covered the units in the primary survey.

Mr. Debashis Roy, WBCS, Assistant Registrar of Co-operative Societies, Uttar Dinajpur

Meeting was held on 30.07.2021 at his office and he confirmed that there are no registered Self-Help Groups or Co-operative Societies involved in pineapple value chain in the district as of now.

Mr. Sandepon Roy, Assistant Director of Agricultural Marketing, Administrative, Uttar Dinajpur

Said that the Department of Agricultural Marketing has been creating essential linkages between the primary producers and consumers so as to minimize post - harvest losses and to ensure maximum share of consumer's price to farmers and moreover to ensure availability of quality agricultural produce at a price comparable to the farm gate prices. He shared an example that Sufal Bangla had procured 3000 kgs of pineapple 2 years ago from Chopra block of Uttar Dinajpur but the consignment did incur some mechanical damage during transportation to Kolkata. No such initiative could be taken last year and so far this year due to the Covid 19 pandemic.

Mr. Sunil Chandra Sarkar, General Manager, District Industry Centre, Directorate of Micro, Small & Medium Enterprises, West Bengal

Shared that the department has been supporting infrastructural development through the Banglashree scheme and an Industrial Park has been set up at Illuabari Industrial Estate, Village Sreekrishnapur, P.O. Islampur, Uttar Dinajpur on a total usable area of 16.18 acres but unfortunately only 10 plots have been alloted out of 64 plots but none of these units have started their operation as on date.

Mr. Sufal Mondal, District Horticulture Officer, Uttar Dinajpur

Meeting was held on 22.07.2021 and he has reiterated that there is no grading, sorting, packaging, pack house storage facilities for pineapple in the district. Further, he provided details about one FPO operating from Sonapur, Block Chopra which the team has covered under the primary survey.

Mr. Satya Singh, District Horticulture Officer, Darjeeling

Meeting held on 27.07.2021 and he apprised the team that the Siliguri Jalpaiguri Development Authority (SJDA) is developing a pineapple hub with cold storage facility at Bidhannagar area in

association with Food Processing Industries, Horticulture Department, Government of West Bengal under financial assistance from APEDA and Assistance to State for Infrastructure Development for Export Aided Schemes. This Pineapple Development Centre would get operational shortly. The team visited the site and found that a reefer container had also been purchased a few years back but there was dearth of maintenance and no activity as on date.

Mr. Uttam Bhowmik, Agri Marketing Officer (Training & Canning), Jalpaiguri

Meeting held on 26.07.2021 referred us to Biswarup Farmer Producer Co Ltd and the team covered the FPO under primary survey.

Mr. Suman Dutta, Field Consultant, Rajganj Block, Jalpaiguri Horticulture Department, Government of West Bengal

Has assisted with farmer identification and interviews on 26.07.2021

Meeting with Industry Anchor

Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India)

Gathered insights on the present functioning of DelMonte Processing Capabilities and pineapple value chain. The major processed products for pineapple by DelMonte which are available in India are mixed fruit juice, crush fruit juice, slices, cocktail, pineapple chunks, pineapple tidbits etc.

Coming to the procurement model of raw materials, Mr Bellani shared that most of the pineapple products were imported from Philippines as there are no available processing industry for pineapple in India by DelMonte. They did have some third-party tie ups but somehow didn't work out because of shortage of quality raw materials. The marketing channel of DelMonte includes both B2B and B2C model of distribution. Recently DelMonte products are also available through various E-Commerce portals.

There is some amount of processing going on in Karnataka as of now, but they are interested to setup a unit close to large production clusters with ample scope of transportation, electricity and other industrial facilities. They had also tried to setup units in Siliguri back during 2008-10 but failed in the process owing to shortage of quality raw materials and scattered production clusters. Procurement of raw materials from Tripura and other closer production cluster was also problematic owing to the issues in transportation and logistics along with labour related issues.

As of now the company is willing to invest in setting up the units as well as contribute towards training and capacity building of FPOs/Cooperatives who are interested to work with them. Company is also willing to carry out monitoring activities for various cultivation related issues during the process of pre harvest, harvest and post-harvest of pineapple. The organisation is also planning to explore options like pre-contracts in the near future.

Schemes & Policies

Currently all MSMEs are entitled for:

- State Capital Investment Subsidy
- Interest subsidy on Term Loan
- Power Subsidy
- Subsidy for Energy Efficiency
- Subsidy on Stamp Duty and Registration Fee
- Subsidy on SGST
- Subsidy for Water Conservation/Environment Compliance
- Subsidy for Standard Quality Compliance
- Subsidy for Work Force Welfare Assistance
- Subsidy for Patent Registration

Silpa Sathi is a single windows facilitation cell that has been setup which provides the following services under one single window:

- Online single window services under the various applicable Acts, Rules, Policies and Schemes
- Necessary guidelines and information to investors intending to start a business or operating a business in the State
- A Common Application Form (CAF) which can be submitted online.
- Status on application submitted and help to track its progress by keeping a close track on the timelines committed to the Investor

West Bengal Incentive Scheme 2013 for Micro, Small and Medium Enterprises

Current Usage:

Total number of applications received – 216

Total number of applications processed - 114

Objective:

to extend fiscal incentives to encourage entrepreneurs to set up Micro, Small and Medium Enterprises with a view to focusing on development of MSMEs in the backward region of the State and creating a sustainable ecosystem in the MSME sector which can maximize the utilization of resource and widen the area of operation to make the State emerge as the MSME leader in the country.

State Capital Investment Subsidy:

- An eligible micro or small enterprise located in Zone C & D area will be entitled to State Capital Investment Subsidy for its approved project as follows: -
  Micro Enterprise:

  Zone C – 25% of the Fixed Capital Investment

  Zone D – 40% of the Fixed Capital Investment

  Small Enterprise:

  Zone C- 15% of the Fixed Capital Investment

  Zone D -30% of the Fixed Capital Investment

- An additional subsidy of 20% on State Capital Investment Subsidy normally admissible will be provided to all eligible micro and small enterprises wholly owned by women, SC/ST, and minority community entrepreneurs.
- An eligible micro or small enterprise wholly owned by women, SC/ST, and minority community entrepreneurs and set up in Zone – A and B area will be entitled to State Capital Investment Subsidy as follows:
  Micro Enterprise: - 15% of the Fixed Capital Investment

  Small Enterprise: - 10% of the Fixed Capital Investment

- The subsidy normally admissible and additional subsidy taken together will not exceed Rs. 50 Lakh for a Small Enterprise.

Interest Subsidy on Term Loan

- An eligible micro, small or medium enterprise will be entitled to Interest Subsidy on annual interest liability on the Term Loan borrowed from a Commercial Bank / Cooperative Bank / Scheduled Banks approved by RBI / RRBs / Financial Institution (Central and State) for implementation of the approved project as follows.

  Micro & Small Enterprise –
  Zone A & B – Subvention of 6% for 5 years.
  Zone C & D– Subvention of 7.5% for 5 years.
- The interest subsidy will be payable annually subject to submission of a statement / certificate (in annexure-A) by the lending Bank / Financial Institution to substantiate that the unit has paid the due interest to the institutions on the due dates and has not defaulted in payment of interest at any time during the period.

Waiver of Electricity Duty

An eligible micro, small or medium enterprise for its approved project will be entitled to waiver of electricity duty on the electricity consumed for the manufacturing activity as follows:
Micro & Small Enterprise –

Zone A & B – 50% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of production.

Zone C & D – 75% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of production.

An eligible micro or small enterprise wholly owned by women, SC/ST and minority community entrepreneurs will be entitled to 100% waiver of electricity duty on the electricity consumed for 5 years from the date of commencement of production of its approved project irrespective of location.

Medium Enterprise -

Zone – B & C – 100% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of production subject to a maximum of Rs. 25.00 lakh per year or Rs.1.25 crore in 5 years.

Zone – D – 100% waiver of electricity duty on the electricity consumption for 5 years and 75% waiver from the 6th year upto 10th year from the date of commencement of production subject to a maximum of Rs.50.00 lakh per year or Rs.2.50 crore in 5 years.

Power Subsidy

- An eligible micro, small or medium enterprise for its approved project will be entitled to power subsidy on the electricity consumed for the manufacturing activity as follows:

  Micro, Small and Medium Enterprise
  Subsidy of Re.1.00 / Kwh for enterprises located in Zone – A & B area and Rs.1.50/ Kwh. for enterprises located in Zone – C & D area for five years from the date of commencement of production.
- The power subsidy will not exceed Rs.20 Lakh per year for a small enterprise and Rs.30 Lakh per year for a medium enterprise and will be payable annually.

Subsidy for Energy Efficiency:

- An eligible micro or small enterprise for its approved project will be entitled to a reimbursement of 50% of the cost of energy audit undertaken by a certified agency. The reimbursement will be made after implementation of the recommendations.
- An eligible micro or small enterprise for its approved project will be entitled to a reimbursement of 25% of the cost of installations for energy conservation as per energy audit subject to a maximum Rs.2 Lakh.

Banglashree for Micro, Small and Medium Enterprises (MSMEs)

Current Usage:

Total number of applications received – 205

Total number of applications processed - 101

Validity:

Comes into effect on and from the 1st day of April, 2020 in the whole of West Bengal and shall remain in force for a period of five years ending on 31st March 2025.

Objective:

The objective of the Scheme is to extend fiscal incentives to encourage entrepreneurs to set up Micro, Small and Medium Enterprises with a view to focusing on balanced development of MSMEs across the State and creating a sustainable ecosystem in the MSME sector which can maximize the utilization of resource, generate new employment and widen the area of operation to make the State emerge as the MSME leader in the country.

State Capital Investment Subsidy:

For the purpose of determination of type and quantum of incentives available under this scheme for the approved projects, according to their locations, the State has been classified into the following zones: -

Zone-A : Kolkata Municipal Corporation Area, All municipal areas of North 24-Parganas, All municipal areas of South 24-Parganas, All municipal Corporation and municipal areas of Howrah.

Zone-B : Districts of Hooghly, North 24 Parganas (excluding municipal areas and Sundarban areas), South 24 Parganas (excluding municipal areas and Sundarban areas), Howrah (excluding corporation and municipal areas), Siliguri Municipal Corporation, Municipal Corporations / Municipal Areas of Paschim Medinipur, Purba Medinipur, Purba Bardhaman,,Paschim Bardhaman and Nadia.

Zone-C : Districts of Purba Bardhaman, Paschim Bardhaman (excluding municipal corporation/ municipal areas), Purba Medinipur (excluding municipal corporation/ municipal areas), Nadia (excluding municipal corporation/ municipal areas), Malda, Jalpaiguri, Murshidabad and Darjeeling (excluding Siliguri Municipal Corporation),Kalimpong, Alipurduar.

Zone-D : Districts of Birbhum**,** Purulia, Bankura, Paschim Medinipur (excluding municipal corporation/ municipal areas), Uttar Dinajpur, Dakshin Dinajpur, Sundarban Areas of South and North 24 Parganas and Jhargram .

Zone-E : Cooch Behar District.

- An eligible micro or small enterprise located in Zone C , D & E area will be entitled to State Capital Investment
  Subsidy for its approved project as follows: -

  Micro Enterprise-

  Zone C – 25% of the Fixed Capital Investment

  Zone D – 40% of the Fixed Capital Investment

  Zone E – 60% of the Fixed Capital Investment Small Enterprise

  Zone C- 15% of the Fixed Capital Investment

  Zone D - 30% of the Fixed Capital Investment

  Zone E – 40% of the Fixed Capital Investment

- An additional subsidy of 20% on State Capital Investment Subsidy normally admissible will be provided to all eligible micro and small enterprises wholly owned (100%) by women, SC/ST, and minority cum enterprise entrepreneurs.
- An eligible micro or small enterprise wholly owned by women, SC/ST, and minority cum enterprise entrepreneurs and set up in Zone – A and B area will be entitled to State Capital Investment Subsidy as follows:
  Micro Enterprise: - 15% of the Fixed Capital Investment

  Small Enterprise: - 10% of the Fixed Capital Investment

- The subsidy normally admissible and additional subsidy taken together will not exceed Rs.50 Lakh for a Small Enterprise located in Zone C & D area and will not exceed Rs. 75 Lakh for a Small Enterprise located in Zone E area.

Interest Subsidy on Term Loan:

An eligible micro, small or medium enterprise will be entitled to Interest Subsidy on annual interest liability on the Term Loan borrowed from a Commercial Bank/ Cooperative Bank/ Scheduled Banks approved by RBI/ RRBs/ Financial Institution (Central and State) for implementation of the approved project as follows.

Micro & Small Enterprise –

Zone A & B – 55% of interest liability for 5 years.

Zone C, D & E– 70% of interest liability for 5 years

Medium Enterprise –

Zone – B, C, D & E: - The interest subsidy will be 25% of total Term Loan interest paid by the enterprise for 5 years subject to a ceiling of Rs. 175 lakh per year.

Waiver of Electricity Duty:

An eligible micro, small or medium enterprise for its approved project will be entitled to waiver of electricity duty (reimbursement of electricity Duty) on the electricity consumed for the manufacturing activity as follows:

Micro & Small Enterprise –

Zone A & B – 50% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of commercial production.

Zone C, D & E– 75% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of commercial production.

An eligible micro or small enterprise wholly owned by women, SC/ST and minority cum enterprise entrepreneurs will be entitled to 100% waiver of electricity duty on the electricity consumed for 5 years from the date of commencement of commercial production of its approved project irrespective of location subject to a maximum of Rs.10 Lakh/year.

Medium Enterprise -

Zone – B &C- 100% waiver of electricity duty on the electricity consumption for 5 years from the date of commencement of commercial production subject to a maximum of Rs.25.00 lakh per year.

Zone – D &E – 100% waiver of electricity duty on the electricity consumption for 5 years and 75% waiver from the 6th year upto 10th year from the date of commencement of commercial production subject to a maximum of Rs.50.00 lakh per year.

Power Subsidy:

An eligible micro, small or medium enterprise for its approved project will be entitled to power subsidy on the electricity consumed for the manufacturing activity as follows :

Micro, Small and Medium Enterprise

Subsidy of Re.1.00 / Kwh for enterprises located in Zone – A & B area and Rs.1.50/ Kwh. for enterprises located in Zone – C, D & E area for five years from the date of commencement of commercial production.

The power subsidy will not exceed Rs.10 lakh per year for a micro enterprise, Rs.20 Lakh per year for a small enterprise and Rs.30 Lakh per year for a medium enterprise and will be payable annually.

Subsidy for Energy Efficiency:

- An eligible micro or small enterprise for its approved project will be entitled to a reimbursement of 50% of the cost of energy audit undertaken by a certified agency. The reimbursement will be made after implementation of the recommendations.
- An eligible micro or small enterprise for its approved project will be entitled to a reimbursement of 25% of the cost of installations for energy conservation as per energy audit subject to a maximum Rs.2 Lakh.

Subsidy on Stamp Duty and Registration Fee :

- An eligible micro, small and medium enterprise will be entitled to a reimbursement of stamp duty and registration fee paid by it for the purpose of registration of documents within the State at the following rates: -

  Micro & Small Enterprise:
  Zone – A - 25%
  Zone – B - 50%
  Zone – C - 75%
  Zone – D & E - 100%
  Medium Enterprise in Zone – B, C, D and E : 75%

Subsidy for State Goods and Services Tax (SGST):

An eligible micro, small and medium enterprise for its approved project will be entitled to refund Net SGST paid to the Government of West Bengal as follows:

Zone B, & C-Refund of 30% of Net SGST paid for eight years from the date of commencement of commercial production. Cumulative refund of SGST shall not exceed 75% of fixed capital investment.

Zone D & E- Refund of 50% of Net SGST paid for eight years from the date of commencement of commercial production. Cumulative refund of SGST shall not exceed 75% of fixed capital investment.

Subsidy for Water conservation/Environment Compliance:

An eligible micro or small enterprise for its approved project will be entitled to a reimbursement of 50% of expenditure incurred by it towards cost of captive Effluent Water Treatment Plant for wastewater recycling and/ or other pollution control devices subject to a maximum of Rs. 2 lakhs.

Subsidy for Standard Quality Compliance:

An eligible micro or small enterprise shall be reimbursed 50% of the expenditure incurred subject to a maximum of Rs.5 Lakh for obtaining ISI / BIS certification / ISO 9000/ ISO 14000 / ISO 14001/ ISO 18000/ISO 22000/ HACCP certification from approved Institutions / Research Laboratories. Any new certificate not covered above may be honored on case-to-case basis according to necessity and essentiality.

Work Force Welfare Assistance:

- An eligible micro, small or medium enterprise for its approved project will be entitled to a reimbursement of 100% in first year and 75% in the remaining years of expenditure incurred by it for paying its contribution towards Employees State Insurance (ESI) and Employees Provident

Fund (EPF) if at least 50% of the employees in the enterprise are recruited from amongst the persons registered with Employment Bank of the State. The period of assistance will be as follows: -
Zone – B - 5 years.

Zone – C - 7 years.

Zone – D & E - 9 years.

Subsidy for Patent Registration:

An eligible micro, small or medium enterprise for its approved project will be entitled to a reimbursement of 50% of expenditure incurred by it for obtaining Patent Registration. Subsidy for Patent Registration shall not exceed Rs.5 Lakh.

TRIPURA

Summary and Flow of the Report

The total production in Tripura is about 1.43 lakh MT in 2020-21. Out of that, the total production in the district surveyed amounts to 0.6 lakh MT which accounts for about 42% of the total production in the state. The major varieties that are grown in the state include giant kew and queen. Kew variety accounts for majority 85-90% of the production.

Out of the total production about 80% is sold from the farm gate to traders/retailers, 2-3% goes for exports through different other channels and more than 10% goes into wastage in Tripura.

Now looking at the infrastructure at each leg of the value chain, these are the major gaps along with **weightage by the respondents** from the survey:

At farmer level-

- Access to transportation and logistical facilities and increased cost of transportation **(90%)**
- Difficulty in harvesting from the farms and limited harvest per day **(75-80%)**
- High cost of labour **(60%-Only big famers could afford labours)**
- Lack of knowledge of new schemes and incentives **(75%)**
- Lack of access to market **(90%)**

At trader/aggregator level-

- No regulated market place for pineapple **(90%)**
- Price escalation due to involvement of agents **(65%)**
- Farmers prefer farm gate selling rather than coming to the market **(85%)**
- Lack of proper storage facilities **(85%)**
- Nonscientific model of procurement by agents, procured by just visual inspection **(90%)**
- Limitation of fruit harvest per farmer **(75-80%)**

At processor level-

- Lack of sorting and grading facilities in the vicinity of the production clusters **(40%)**
- Lack of specified collection points for procurement of pineapple which in turn increases cost of procurement **(75%)**
- Non availability of storage facilities in the vicinity of the production clusters **(65-70%)**
- High cost of labour **(80%)**
- Social disturbances sometimes hamper transactions **(75%)**
- Lack of availability of skilled labor for harvesting and evacuation of the crop **(75-80%)**
- Lack of all-weather roads till the farm lands **(80%)**
- Scattered production clusters and difficulty in collection **(85%)**
- Limitation of availability of reefer vans & transportation facilities on time from the clusters **(85%)**

Though previous industrial setup has had an effect on the varietal adoption by the farmers for processing, scattered production clusters and lack of support infrastructures such as washing, sorting, grading, transportation and lack of access to storage infrastructures are some of the major causes for disinterest of the industries.

Some of the specific recommendations in the report are:

- Setting up of cluster based model farms in coordination with industry leaders which would facilitate farmer training on production, harvesting and post harvesting according to processing industry standards
- Widespread Introduction & implementation of staggering technology
- Devising BMPs(Best Management Practices) in coordination with large industries/experts and implementation with continuous monitoring support by State Horticulture Department
- Block level storage infrastructure considering quantum of evacuation and transport induced wastage
- Setting up of integrated pack houses at major production districts like Dhalai, North Tripura and Unakoti as well with further provision of insulated vans of minimum (5MT & 10MT) capacity
- Solar powered primary processing units within 15-20 kms of production clusters
- Pilot project on minimal processing of pineapple (Fresh Cut Pineapple) with 100% subsidy at North Tripura and Dhalai
- Central food processing plants could be integrated into Mega Food Parks such as Sikariya Mega Food Park to minimize initial setup cost of the unit and promote pineapple processing
- Setting up of Mobile Pre-cooling units
- Setting up of canning line in Dhalai
- Setting up of spray drier units in the districts
- Supply of fruit pulpers for the state
- Setting up of export hub at Dhalai owing to availability of GI tagged Tripura Queen Pineapple
- Awareness drives and enrollment drives for farms practicing organic cultivation
- Integration of Districts like North Tripura into PMFME Scheme as the quantum of production is significantly less

Approach & Methodology

The Assessment Study for Pineapple focuses on identifying gaps in infrastructure & processing facilities for development of potential value chains for perishable products under Operation Greens Scheme of MoFPI. The study has adopted both primary and secondary research tools. Preliminary research was based on detailed desk review of relevant secondary literature and interactions with relevant stakeholders during inception and subsequent stages. Primary research and assessment were based on the qualitative data/information that was collected through government official interactions as well as cluster/field visits and consultations with different stakeholders such as farmers, traders, processors, exporters etc. along with different enabling and institutional stakeholders.

Study Area

The following districts were taken into consideration for an in-depth study and gap analysis of pineapple value chain and their status of functioning which are prevalent in the state:

- Dhalai
- North Tripura

Stakeholder Consultation

The various participants covered during the primary/field level interactions included farmers, traders, small & medium scale processors and local retailers. Various discussions and consultations were carried out with Department of Agriculture, Horticulture, Industries etc. to get an overview of the prevailing situation pertaining to the status and gaps in the value chain. Suggestions were also noted from different department heads and other relevant stakeholders in order to successfully have an in depth understanding and deliver some constructive recommendations.

The identification of different focus groups and farmers was done in coordination and consultation with the district level officials which included District Agriculture Officer (DAO), District Horticulture Officer (DHO), Commodity Product Experts, Nodal Officers, Trainers and other opinion leaders at the cluster and village levels. Focus Group Discussions (FGD/s) were also carried out which covered some relevant topics like challenges in production, post-harvesting, storage, marketing, processing and other value-added services for the focus crop. Other information which included package of practices prevalent, cost of production, farm level value addition, primary processing facilities, access to market and logistics, access to processing facilities and barriers in the value addition process were also recorded.

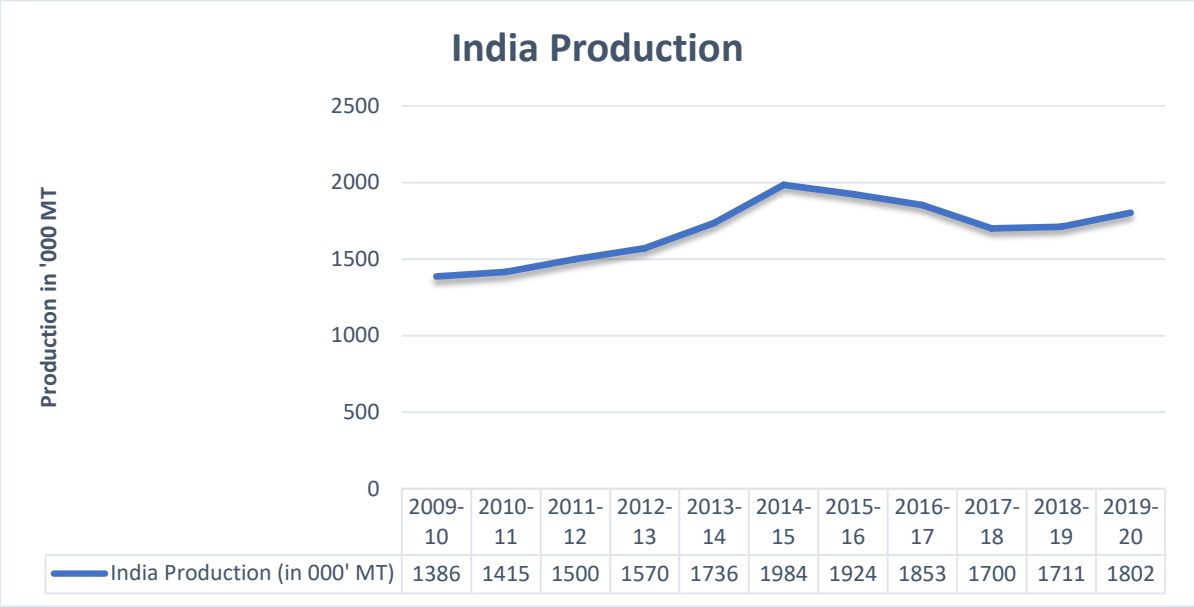
Stakeholders	*Key points of discussion*
Industry Mentor	Existing scope & challenges Present Status of industry Scope of Investment

	Financial grants/schemes availed (if any) Line of business Types of products/product line in which company is involved in Expectation from the study Suggestion (if any)
Farmers/FPOs/FPCs	Existing challenges and opportunities
	Access to finance
	Marketing and access to markets
	Food safety standards and requirements
	Grants or schemes availed
Processors/Traders	Existing challenges and opportunities
	Access to finance
	Marketing and entrepreneurial skills
	Access to information/knowledge
	Certification (Organic & Geographical recognition)
	Financial linkage and grants availed
District Officials	Sampling of clusters for primary research and evaluation
	District level support programs for small agri-food producers/processors
	Matching schemes and targeting mechanism
	Role of implementing agencies in districts if any
	Existing economic opportunities and existing market failures
	Prevalent schemes in the districts
	Secondary data collection
	Other challenges for the particular value chain
Statistical cell	Secondary data collection on production of commodities
State Officials/Directorates	Priority sectors and subsectors
	Discussion on ongoing and future programs
	Understanding the gaps between multiple support programs
	Secondary Data collection

Pineapple Production & Trade flow in Tripura

Production in India

The total production of pineapple recorded by India in the year 2018-19 stands at 1711 thousand tones.



The above graph shows a gradual decline in production of pineapple following the year 2014-15. The reason as per the trend can be various factors, but the most crucial one of them would be decrease in area under cultivation for pineapple.

According to study and analysis, the region under the survey, especially the NER region contributes to approximately 40% of the total production of pineapple. Out of the total production from these areas approximately 90-95% of the production is organic in nature and cultivated through age old traditional cultivation practices.

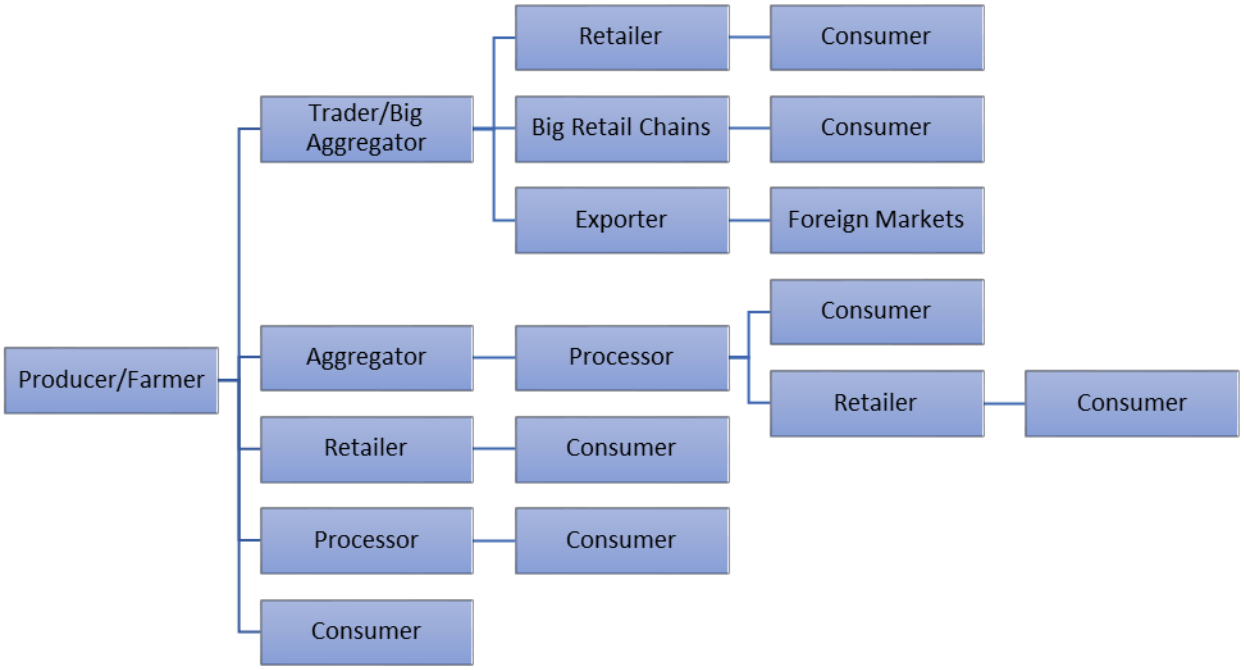
State wise Production

The table below shows the state wise production of pineapple in India.

Sl no.	State	2014-15		2015-16		2016-17		2017-18	
		Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)
1	West Bengal	320	16.13	330.06	17.15	336.11	18.13	345.15	20.3
2	Assam	281.27	14.18	285.17	14.82	268.92	14.51	296.52	17.44
3	Karnataka	156.31	7.88	155.41	8.08	164.26	8.86	163.73	9.63
4	Meghalaya	124.6	6.28	123.13	6.4	140.95	7.6	144.73	8.51
5	Manipur	136.75	6.89	128.51	6.68	127.03	6.85	134.11	7.89
6	Nagaland	142.5	7.18	127.81	6.64	132.62	7.15	132.83	7.81
7	Tripura	170.89	8.61	180.26	9.37	94.67	5.11	127	7.47
8	Bihar	116	5.85	116.3	6.04	116.58	6.29	115.13	6.77
9	Andhra Pradesh	35.96	1.81	55.38	2.88	64.41	3.47	71.33	4.2
10	Kerala	348.06	17.54	305.67	15.89	310.32	16.74	69.72	4.1

According to the previous table, West Bengal is one of the highest contributors towards pineapple production in India followed by Kerala and Assam respectively. Tripura has 7.47% of total production share for pineapple in India.

The below mentioned diagram depicts the market channels prevalent in India for pineapple value chain.



Tripura

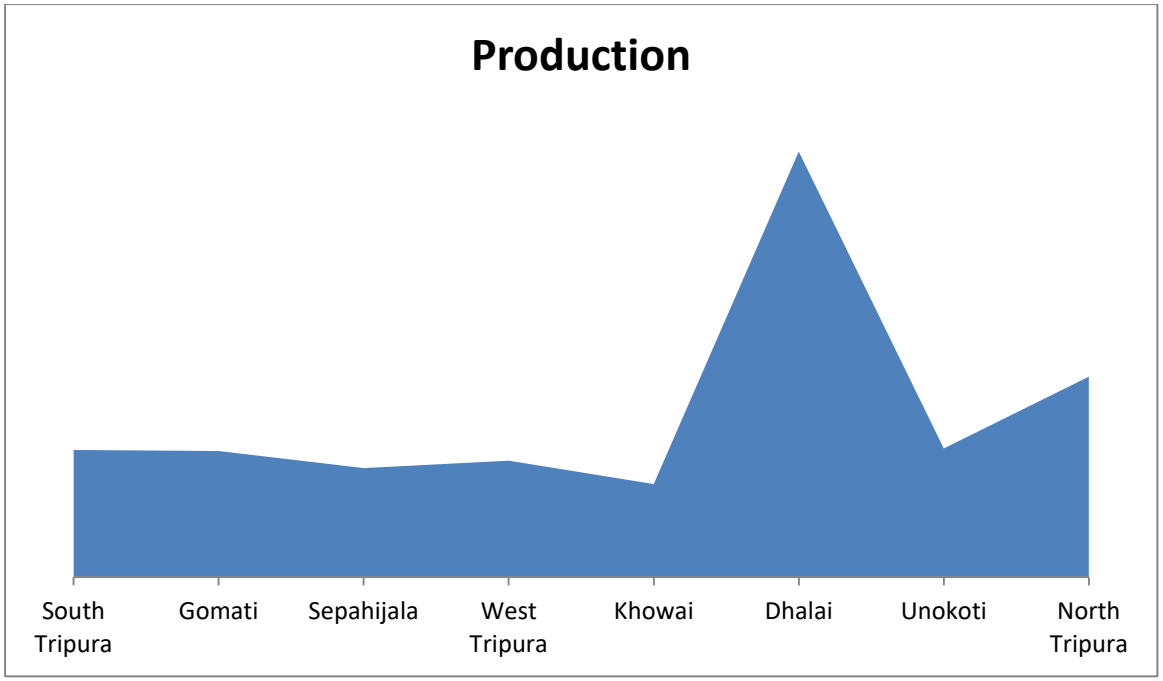
Located in the north-eastern part to the country, Tripura is the third smallest State of the India. The State shares about 84 percent of the border with Bangladesh in the north, south, and west and is connected to rest of India in the east sharing regional borders with Assam and Mizoram.

Pineapple Production in Tripura[9]

The table below consists of total area, production and productivity for all the districts in Tripura:

Sl no.	Districts	Area (in Hect)	Production (in MT)
1	South Tripura	945	13778
2	Gomati	937	13661
3	Sepahijala	810	11810
4	West Tripura	865	12612
5	Khowai	691	10075
6	Dhalai	3165	46146
7	Unokoti	956	13938
8	North Tripura	1490	21724
Total Tripura		**9859**	**143744**

[9] Directorate of Horticulture & Soil Conservation, Tripura (Data for 2020-21)



District Wise Production & Trade Flow

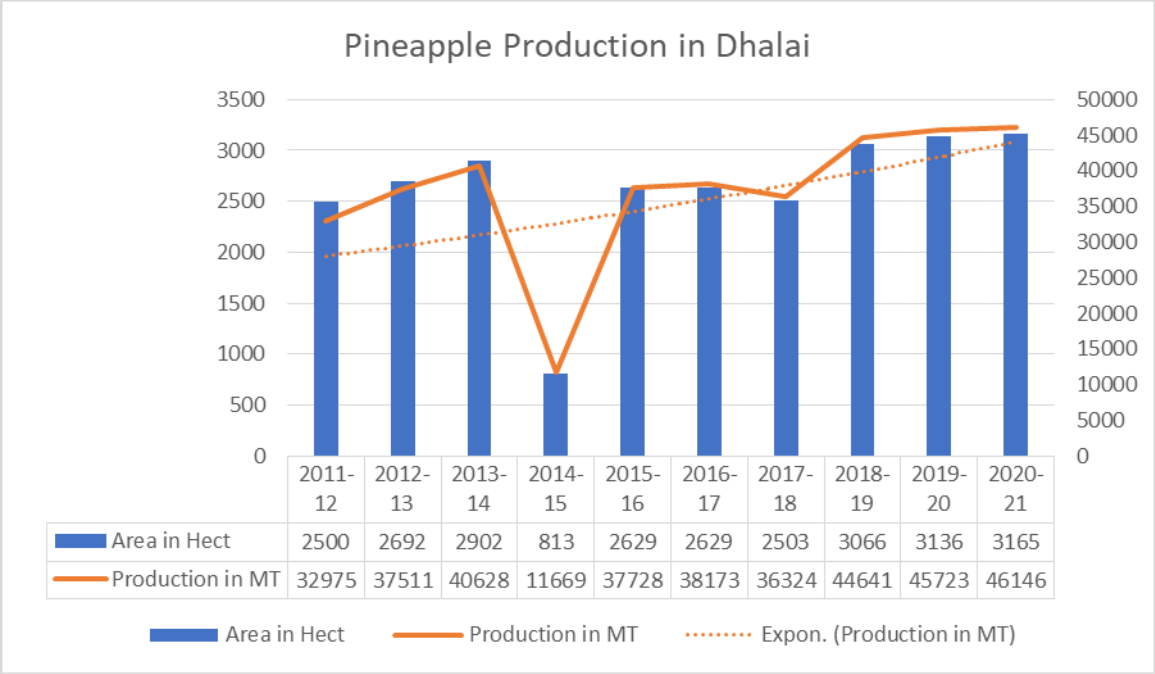
The major clusters which are part of the study are Dhalai and North Tripura. These districts are majorly known for the quantum of production of pineapple.

Dhalai

Dhalai is an administrative district in the state of Tripura and headquarter at Ambassa. According to 2011 census, Dhalai was the least populous district in Tripura. In the North-eastern part of Tripura, the district covers an area of about 2426 km^2. It is mainly between two hills: Atharamura Range and Sakhan Range. More than 70% area is hilly and forest covered. The terrain is mostly undulating and hilly with small water streams (*chharas*), rivers and fertile valleys intervening. Major rivers originating from Dhalai are Dhalai, Khowai, Gomati and Manu. Major hills are Atharamura, Longtharai, Kalajhari and part of Sakhan. The district headquarters at Ambassa is about 85 km from the state capital Agartala. The district is bordered by Bangladesh on the northern and southern sides.[10]

The district has a tropical climate with hot and humid summers, a prolonged rainy season and warm winters. Rains are frequent in March and April. Maximum temperatures in summers and winters are 36 °C and 28 °C, respectively. The minimum temperatures in summers and winters are 17 degree and 5.3 degree Celsius respectively.

[10] https://en.wikipedia.org/wiki/Dhalai_district



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Area in Hect	2500	2692	2902	813	2629	2629	2503	3066	3136	3165
Production in MT	32975	37511	40628	11669	37728	38173	36324	44641	45723	46146

Source: Directorate of Horticulture & Soil Conservation, Tripura

The above graph depicts the production and area for cultivation of pineapple in Dhalai Tripura. As seen from the above graph considering exponential average of production, it is seen that the production is showing positive curve and it may be inferred that the rate of production may increase provided ample market opportunities are made available for the stakeholders.

The major varieties that are widely available in the district include Kew and Queen. Kew is the major variety having production share of nearly 90% in the district. Queen has a comparative low share of production in Dhalai. However it was learnt that some of the queen variety of pineapple were also exported owing to the organic characteristics and recent Geographical Indication registration of Tripura Queen Pineapple.

Trade Flow

Considering Dhalai:

Channel 1 (85%)

Farmer➔Trader➔Retailer➔Consumer

Channel 2 (10%)

Farmer➔Retailer➔Consumer

Channel 3 (5%)

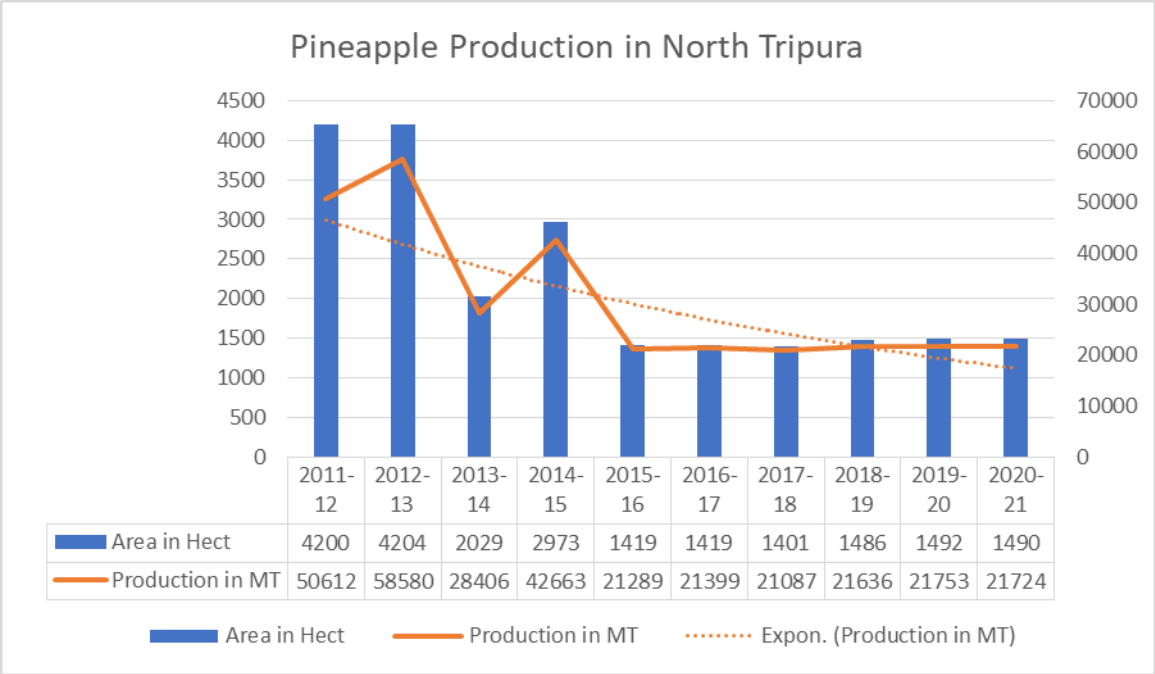
Farmer➔Local Haat➔Consumer

Here owing to the vicinity of the production clusters at Dhalai to the National Highway, movement of goods was a little easier than North Tripura during the time of the study. Though kew is a variety that is mainly used for processing, most of the pineapple from Dhalai was sold at the open market

and from there found its way to other markets inside and outside the states such as Agartala, Guwahati etc. Some of the pineapple also found its way to Bangladesh owing to the vicinity and porousness of the borders as learnt from the farmers.

North Tripura

North Tripura is an administrative district in the state of Tripura in India. The district headquarters are located at Dharmanagar. It is spread across 1422 km^2. It is majorly divided into three sub divisions which are Dharmanagar, Kaiashahar and Kanchanpur.



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Area in Hect	4200	4204	2029	2973	1419	1419	1401	1486	1492	1490
Production in MT	50612	58580	28406	42663	21289	21399	21087	21636	21753	21724

Source: Directorate of Horticulture & Soil Conservation, Tripura

As evident from the above graph the production shows an exponential downward trend. The major reasons are division of the district into two parts and lack of interest of farmers to grow pineapple eventually.

During the year 2012, North Tripura was divided into Unakoti and North Tripura. Hnece, subsequently in 2013-14 the graph is showing loss of area and production under the district. Unakoti is also one of the major production clusters in Tripura.

Though varietal data was not available from the state and district official records, it was learnt from the study that kew variety of pineapple was abundantly found in the state as well as major production clusters. Adding to that the fruit here was bigger in size and had an average weight of 1.5-2.0 kg per piece.

It has been seen that most of the farmers here in North Tripura are slowly moving out from the cultivation practice of pineapple towards betel/areca nut farming. The major reason being pineapple has a number of harvesting and post harvesting related issues which we will discuss in the report.

Trade Flow

The major marketing channels that are prevalent in the district are:

Channel 1 (80%)

Farmer➔Local Aggregator➔Trader➔Retailer➔Consumer

Channel 2 (15%)

Farmer➔Local Haats➔Consumer

Channel 3 (5%)

Farmer➔Consumer

Though most of the farmer here grew pineapple for commercial purposes, lack of proper road and transportation facilities to the district currently is playing a major hindrance in the on time logistical movement of the crop. So majority of the farmers were dependent on the local aggregator to collect the produce from the farm gate. This sometimes also gave rise to distress selling. Currently we are seeing that most of the farmers have stopped cultivating pineapple and have switched to different other crops such as arecanut/betelnut. Considering North Tripura, the current market prices at Kadamtala and Panisagar are Rs 13/- per kg and Rs 15/- per piece respectively during the study.

Infrastructural Assessment & Gaps

As observed above, the value chain is mostly concentrated within the primary players in the state up to the point of aggregation, and processing has been nonexistent.

Now the following study will talk about infrastructure, the way it is existing at each leg of the value chain and major identified gaps found thereof. It will be followed by recommendations to improve the functioning of overall value chain and make it economically viable and attract investments for the value chain and the sector as a whole.

Producer

Most of the farmers surveyed here owned the land and the average land holding in the region was close to 3.4 hectares.

Absence of any processing facilities from the last ten years has discouraged the farmers slowly, and is forcing them to go for other crops other than pineapple. This issue was majorly seen in areas like North Tripura where access to good road facilities is not present. Construction of new road infrastructure is taking place as per our observation but due to COVID19 the work slowed down and has increased the travel time by road to more than 3 hours. This has discouraged the farmers to go to the market and sell their produce owing to the cost of transportation.

Most of the farmers also faced challenges in harvesting and evacuation due to hilly terrains and lack of access to proper roads or ropeways. It was observed that a farmer could only harvest a maximum of 100-130 pieces of pineapple a day. The major reason being, the increased amount of time taken to harvest from uneven field and high cost of labour.

Some of the big farmers had 8-10 workers and during peak harvesting they demanded Rs 400-500/- a day which was quite high. The fruits are mostly evacuated from the field by keeping it in baskets woven with bamboo strips and carried to the nearby roadside areas or markets for sale. Farmers here also practice stacking in which they evacuate the produce and stack it in a dry location where vehicles such as mini vans and pick-up trucks are accessible. Generally small traders/aggregators come to these stacking/aggregation points and these pineapples are loaded onto the vehicles.

Though most of the farmer's individual contribution towards total production was very low scale, sometimes it was seen that the farmers faced loss of 10% or more in between harvesting and loading them onto the trucks or pick up vans.

Primary Processing

Primary processing consists of washing, sorting and grading activities. It was learnt from the interactions that there were no such facilities present in the state as of now. The aggregators or traders normally visit the farms 3-4 days prior harvesting to decide the prices according to visual inspection of the size and colour of the pineapple.

Post-harvest the farmers directly load the pineapple onto the wooden bamboo baskets as per the verbal agreement with the aggregators. The baskets can hold 25-30 pieces on an average. So we

concluded that the entire production was always sold as a lot without any significant sorting or grading activities. Lack of electricity and support infrastructure are some of the major issues that may hinder the operation of primary processing units in the clusters.

Though there are some cold storages in Ambassa, Dharmanagar and Kumarghat, none of the storage facilities cater to fruit storage due to infrastructural limitations.

Transportation & Logistical Service Provider

Most of the times it was seen that the buyer or trader was responsible to arrange transport of the produce from the field to the farm. Most of the produce was carried through pickup vans and at some instances open trucks were used for larger quantities. Some of the farmers/ traders also used passenger/cargo auto for transportation. The majority of the cropping happens in remote areas which lack last mile connectivity. Sometimes incessant rains also pose a barrier in the overall commodity flow from Point A to Point B owing to the road blocks. So it was observed that during surplus production mostly at North Tripura farmers used to distress sale their produce.

The major vehicles that were used in the transportation had a capacity of 5-10 MT. Prices for the transport industry was not fixed as it depends on the weather and road quality. Though there are subsidy schemes running in the state on transport, lack of awareness by the traders and farmers often resulted in not availing the subsidy.

Kisan Rail[11]

Sl no	From - To	Date ofInauguration	Frequency	No oftrips	Loading(Tonnes)	Revenue(Rs, in lakhs)
1	Dhupguri to Dharmanagar	19-Feb-21	As per demand	1	234	6
2	Changrabandha to Dharmanagar	23-Feb-21	As per demand	1	238	3.1
3	Indore to Agartala	27-Dec-20	As per demand	7	3,468	197.6
4	Nagarsol to Agartala	02-Feb-21	As per demand	6	3,095	191.4
5	Dhupguri to Agartala	21-Feb-21	As per demand	6	1,803	21.4
6	Falakata to Agartala	25-Feb-21	As per demand	6	2,488	32.2
7	Changrabandha to Agartala	31-Mar-21	As per demand	3	1,223	16.2
8	Renigunta to Agartala	13-Apr-21	As per demand	1	522	32.4
9	Agartala to Adarshnagar, Delhi	11-Jun-21	As per demand	1	10	0.3
10	Jalandhar to Jirania	31-Dec-20	As per demand	1	353	20.1

Though the above mentioned trains are operational, but none of the trains as of yet have been involved in carrying pineapple to and fro considering Tripura. No farmer, trader or transporter had any idea about these trains running and what are the prevalent prices of transportation.

[11] www.irctchelp.in

Trader/Aggregator

The major marketing clusters in Tripura for pineapple are:

2) Nutanbazar (Gomati)
3) Kadamtala & Panisagar (North Tripura)
4) Boxonagar, Melaghar & Sonamura (Sepahijala)
5) Pabiacherra (Unakoti)

Considering North Tripura, the current prices at Kadamtala and Panisagar are Rs 13/- per kg and Rs 15/- per piece respectively during the study. The prices in the month of June were hovering around Rs 19/- per piece.

Though Dhalai is a major production cluster but there are no significant market places for pineapple in the region. Most of the pineapple found its market through different aggregators/traders to Agartala and further at Silchar & Guwahati.

It was learnt that the remoteness and the difficult terrain always limited timely harvesting and evacuation of the fruit and also increased the overall cost of procurement for the trader both in and outside the region.

Considering the present market scenario, there were no regulated markets found in the clusters. So generally farmers sell their produce from the farm gate only. Some of the big farmers in the region also acted as aggregators and bought pineapple from the small farmers to sell in bulk quantities to the traders or major market places by themselves. Due to lack of appropriate storage facilities in the vicinity, most of the farmers had no bargaining power on the prices. Market places such as Bishramganj though not regulated, has necessary infrastructure like shed structures and storage facilities.

Earlier in 2019, Tripura successfully exported pineapples to Dubai and other parts of the Middle-east. 300 MT of queen pineapples were exported to Dubai and Doha as part of the state government's aggressive push for the pineapple variety. Two companies- AR4 Agro International, Hyderabad in Telangana and KCS Quality Inspection Private Limited, Delhi are taking these organic pineapples with the support of Indigo flight. A Bangalore-based company 'Internal Competency Center for Organic Agriculture (ICCOA) had an agreement with the Tripura government for marketing the Neermahal Organic Farmers Producers Company where farmers produce organic pineapples.

Secondary Processor

A Food Park has been set up at Bodhjungnagar (near Agartala) to provide the infrastructural facilities required for food processing industries. The agro-climatic conditions are favourable for growing various fruit and horticultural crops.[12]

Currently there is no processing related activities found in the clusters for pineapple. Though kew pineapple variety which is good for processing is abundantly available in the state, all the products normally are sold in the open market as table variety. There are many aggregators who come to such open markets to buy the fruit in bulk and then according to the quality sell them to concerned

[12] https://swaagat.tripura.gov.in/#/page/services/investment-services

processors outside the state. Large units such as Dabur, NERAMAC etc procured pineapple from the growers in the past giving them an assured market. But high cost of transportation and labour made the transactions non-viable. These units have been closed since 2008-09. Hence due to lack of assured market, most of the farmers are seen migrating to other crops such as betelnut/arecanut etc.

Most of the processing industries demand a steady flow of raw materials throughout the year. Some of the farmers were seen practicing staggering in which the flowering and productivity is increased by application of chemicals like Etharal. This to some extent along with setting up of cluster level storage would be beneficial for the processing industries.

Recommendations

Production

The most important step in the production leg would be to increase the production as well as productivity through encouraging farmers for area expansion and adhere to recommended management practices. Initially setting up of cluster based model farms would be beneficial. These model farms would act as production of the crop adhering to the scientific and industrial package of practices as well as information dissemination centre for the nearby farmers.

Introduction of staggering, as a process to larger amount of farmers to reap the benefits of longer cropping season and higher productivity. Best management practices to be devised with large industries and product experts and increased promotion of the same would make the produce processing industry ready and marketable. This would also ensure standardisation of product quality. These steps are only possible with continuous monitoring support by the Horticulture departments as well as the interested industries.

Primary Processing

Setting up of block level collection and storage infrastructure is the need of the hour. Most of the farmers and traders incurred huge losses owing to the absence of any storage infrastructure for pineapple. Initially setting up of integrated pack house can be setup at district levels for major production districts like Dhalai with provisions of insulated vans to carry the products and minimizing loss during transportation.

Development of solar based sorting and grading yard could solve to some extent the lack of proper electricity network to the clusters in the purview. These units needs to be within 15—20 kms of the production clusters to efficiently operate considering the quantum of pineapple Dhalai, North Tripura and Unakoti has. This would also give scope to product exports considering the uniqueness of Tripura Queen Pineapple from the state. Considering the quantum and techniques such as staggering, it would ensure supply of pineapples for atleast six months. This would set a base for different interested processing units to set up their infrastructure in vicinity of the state and procure quality raw materials with minimum monitoring.

Marketing & Transportation

Though most of the pineapple finds its market through regular local markets in the state, export related infrastructure for both kew and queen would be beneficial for the state. Now inorder retain the quality attributes of the fruit before exporting, it is necessary that the transportation of goods needs to done in closed and temperature controlled vehicles to avoid loss of quality during transportation. Hence insulated vans needs to be present at major market places as well as production clusters. So along with the integrated pack houses suggested earlier, provision of insulated vans with capacity of 10MT may be integrated with the system.

Multiple fruit processing infrastructure may be setup with minimal processing of pineapple. Marketing and distribution of fresh cut pineapple may be carried out as a pilot project and both domestic and export markets can be targeted.

Under the MIDH scheme, currently 50% subsidies are being provided for:

- Integrated pack houses with facilities for conveyor belt, sorting, grading, washing and weighing
- Primary/Mobile/Minimal processing units
- Rural Market
- Static, Mobile vending cart/Platform with cool chamber
- Reefer Vans/Containers
- Food processing units

Though the above subsidies are provisioned in the state, pilot projects needs to initiated with 100% funding so as to generate interest among the farmers and cooperative groups to adopt to these techniques and then invest in the same.

Processing

Though in the past some processing industries procured raw material from Tripura, it has been more than 10 years that the state has seen any direct procurement by such large industries. The reason being, gaps in transportation & logistics and lack of skilled labour. So apart from setting up industries skill development and training also needs to be done for the youth as well as the women, who also are part of the farming and harvesting process.

Various processed products of pineapple such as jams, juice powder, tidbits and juice concentrates have got immense scope and market. Currently pineapple juice is one of the largest traded products after apple and orange juice.

Sikariaya Mega Food Park has been created along with 10 other designated food parks in the state. Centralized multi fruit processing plants could be integrated to such parks to efficiently procure the raw material and process at one place without again investing in collection points for processing.

Context & Interventions

The following are the major issues that came up during the assessment for Tripura:

The pineapple harvesting season in Tripura starts from June and goes on till December. The typical harvesting practices include evacuating manually from the orchards. As harvesting of pineapple is a labour-intensive activity, farmers in the districts such as North Tripura and Dhalai generally couldn't find affordable labour and carry out the harvesting manually. The fruit is collected in a basket made of bamboo and then evacuated from the fields. This results in very low quantum of the produce being harvested in a day which comes to around 100 pieces per farmer. This result in on field damage of the crop and some farmers reported that the damage was close to 15-20% of the total harvests as reported by the farmers. Farmers in North Tripura mentioned that the fruit damages also sometimes exceeded 20% as there was no scientific plantation method and harvesting all fruit at once was not possible. North Tripura region also faced issue related to transportation availability.

Considering transportation, the major problem is with the availability of last mile connectivity of roads till the farms and lack of all-weather roads. But we are not considering any interventions for

the same here. Because of the above road conditions, the time taken for the produce to be transported from districts like Dhalai & North Tripura to Agartala sometimes take around 8-10 hrs and more during monsoons (Peak Harvesting). During such transit, majority of the produce (5-8%) gets damaged due to lack of proper road infrastructure and hilly terrains, which adds up to the overall loss in the commodity flow. The peak harvesting happens during monsoons which makes the transportation even more difficult. During such seasons the vehicles get stranded some time 1-2 days, which in turn adds up to the damage of the fruit and transportation related losses.

Similarly considering marketing of the produce, the farmers mostly prefer farm gate selling as individual contribution to the total quantum of harvesting is very low. Most of the traders and aggregators go to the farm gate to collect the produce and fix the price solely on visual inspection. Absence of any sorting or grading facilities at block or district level, forces the farmers to sell their produce in bulk and mostly at a very low price (Rs 10-12/-) especially during peak harvesting. This was more prevalent in district of North Tripura. Farmers in Dhalai had the leverage of comparatively good connectivity of roads although the transport facilities were still an issue in the district.

Processing of pineapple in Tripura is non-existent. Most of the pineapple is consumed as fresh fruit in the state and the rest finds its market through aggregators and traders to other nearby states such as Assam and West Bengal. In terms of variety queen is mostly available in Dhalai whereas kew is available in districts of North Tripura.

The above gaps are calling for interventions in the form of cold storages, driers, reefer vans, primary processing/minimal processing units and secondary processing units. Other than the above which are mostly infrastructure related, there are other gaps that needs to be addressed in order to facilitate effective use of infrastructure. Both types of initiatives need to go hand in hand.

Districts	Recommendation with indicative units	Why are we making the recommendation	How implementable is this recommendation	Indicative Costing (in Lakh x unit)	Investment Interest	Remarks
• **North Tripura** • **Dhalai**	APEDA certified Integrated Packhouse 1 TPD capacity (3 no.s) 2 in North Tripura as it will cater to Unakoti district too And another in Dhalai	• 70-80% is organic queen variety • No pack houses available	Long term	50 x 3 = 150	Large industries, HNI individuals and Warehouses	In terms of investment interest, assumptions were taken on target beneficiaries as the current study was limited to 2 districts and there were no interested investors. The major reason as found out from the study was lack of electrical infrastructure in the focus districts. However our

						analysis and field assessment suggests that there is a dire need of pack houses for pineapple in each district.
• **North Tripura** • **Dhalai**	Mobile Pre-cooling Units (5 no.s) 3 in Dhalai & 2 in North Tripura	• No precooling infrastructure available • Transportation of the produce is affected due to monsoons and bad weather	Short term	25 x 5 = 125	FPOs, Cooperatives and Big Farmers	During our study there were no FPOs found related to pineapple in the districts, however there are many unstructured and unregistered group of farmers specifically in Dhalai who were interested to scale up if proper funding was available
• **North Tripura** • **Dhalai**	Farm level sorting and grading facilities – 1MT/hr (5/district)	• No scientific method of pricing is followed. • Farm gate prices are sometimes only 20-30% of the retail price	Short term	15 x 10 = 150	FPOs, Groups and Small industries	Currently 85% of the commodity is sold from the farm gate and absence of any primary infrastructure forces the farmers fall prey to the price monopoly of the buyers
• **Dhalai**	Canning line for fruit pulp 2TPH (1 in Dhalai district)	• Minimal processing like canning may reduce the overall loss in the value chain flow • No infrastructure found for canning in the districts	Short term	67 x1 = 67	MSMEs and Large Industries	Though the survey did not reveal any specific investors for the said intervention, establishment of canning facility in the district is highly recommended by various stakeholders during the survey and considering huge production and farm level damages
• **North Tripura** • **Dhalai**	Spray drier units 2 for each district	• Dried & powdered pineapple are known to have better price realization.	Long term	155 x 4 = 620	MSMEs and Large Industries	Setting up of spray drying is proposed keeping the market demand and quantum of production. So this may be

		• Will be a viable model considering the quantum of produce				considered as a long term but definite intervention.
• **North Tripura** • **Dhalai**	Fruit pulper (100 kg/h) to be provided at district level Minimum 30 no.s to be provisioned for farm level operations for the state	• Pulping is one of the techniques to increase shelf life of the commodity and make it processing ready • Pulping would help in long term utilization as a raw material for industries	Short term	0.79 x 30 = 23.7	Individual big farmers, FPOs and Cooperatives	Rather than a business proposition, availability of fruit pulper is a necessity in the cluster owing to unavailability of on time transport facilities and transit related losses. Pulping would improve price realization and ensure continuous raw material availability for the industries.
• **North Tripura** • **Dhalai**	Reefer vans 1600 kg to be provided at district level – 5 for each district	• It was observed that losses during evacuation and transportation was 8-10%.	Short term	3.60 x 10 = 36	FPOs, Big Farmers, Transporters, MSME and state government	As temperature controlled environment in transportation of the commodity plays a major role towards avoiding transit related losses, many transporters and FPOs have shown interest towards investment in the same.
• **North Tripura** • **Dhalai**	Refrigerated containers 10-20 tons capacity to be provided at district level – 2 for each district	• For long distances open trucks are used which expose the pineapples to harsh weather conditions and most of the fruits get damaged or become unfit for consumption	Long term	8.00 x 4 = 36	Transporters and Big traders	Though there were no investment interest shown for this proposal in the short term. This intervention will help transporting the commodity to long distances and transporters mentioned that they are interested in such interventions in the long run if made available.
Total Cost of Intervention (Indicative)				**1207.70**		

Hence the total indicative cost of intervention comes to Rs 12.07 crores for the cluster which include Dhalai & North Tripura.

All the above recommendations are subject to a streamlining of basic value chain infrastructure in the state as presently considering pineapple as a commodity there were no registered FPOs or Cooperatives found in the district. Though there are scattered and unregistered groups of farmers who work together at the time of harvesting the fruit. Erratic electrical supply in the cluster is also a discouraging factor that poses as a barrier in setting up such infrastructure and running them up to their full potential. Discussions revealed that absence of such infrastructure would force the investors to use alternative sources of electricity generation such as gensets or large solar unit infrastructure which would again add up to the overall cost of operations.

Other than the above, focus on exports is also highly recommended considering the GI tag associated with queen variety of pineapple in Tripura. So APEDA Certified packhouses have also been suggested in the clusters. So in order to encourage the various stakeholders a comprehensive approach needs to be taken in form of streamlining roads, electrical infrastructure and setting up of dedicated selling points in the districts and deploying MSP for pineapple at the selling points. In addition to that, we also recommend including North Tripura as one of the districts in PMFME scheme looking at the quantum of production of pineapple as compared to the total quantum of production in the state. This scheme would also help in streamlining the creation of FPOs/SHGs and other value additions and gradually work towards including the districts in to Operation Greens in the near future.

Interactions

Meeting with State Government Departments

Shri C.K Jamatia, Secretary and Dr. Phani Bhusan Jamatia, Director, Horticulture and Soil Conservation

Had a meeting along with Shri C.K Jamatia and subsequent team meetings at his office. We got to know that presently all the primary processing activities such as sorting, grading and required packaging was carried out by the local traders manually. The state has one storage facility with capacity of 10 MT per shift and is currently under execution at Agartala under the RKVY scheme. Other than that, there are 11 cold stores that are currently run by Govt. of Tripura with a capacity of almost 18000 MT.

The department also is supporting infrastructure development for MSMEs and large industries. Currently they are providing support through MIDH scheme which entitles 50% subsidy on:

- Integrated packhouses with facilities for conveyor belt, sorting, grading units, washing, drying and weighing.
- Primary/mobile/minimal processing units
- Rural Market
- Static, Mobile vending cart/Platform with cool chamber
- Reefer vans/Containers
- Food Processing Unit

Marketing support schemes included Apni mandi under MIDH and formation of FPC/FPOs.

Though well-connected roads are existing to major clusters, rope ways are required for evacuation from the hilltops and low-lying areas. Currently Sikariaya Mega Food Park has been created along with 10 other designated food parks.

Railway connectivity exists from Agartala Railway Station through different district headquarters for different mega cities like Guwahati, Kolkata, Delhi etc.

Suggestions in terms of infrastructure included setting up of pack houses at district level with weigh bridge facilities and provision of refrigerated parcel vans to minimise storage and transportation related losses.

Special mentions/suggestions include 100% financial assistance for a few units on pilot basis for development of infrastructure of industry. Attractive production incentives and export incentives may be announced to attract more beneficiaries and streamline the overall value chain.

Some gaps that have been identified by the department and need immediate attention are:

• Absence of integrated pack house (1 no. packhouse is executed in Agartala)

• Absence of refrigerated parcel vans, integrated pack house at district level

• Non availability of motorized vehicle with FPOs/FPCs etc.

• Infrastructure for transportation of commodities from hill top

• Non availability of packaging materials locally

Shri. Hirendra Debbarma, Deputy Director (Horticulture), North Tripura

Meeting revealed that though few farmers are benefitted through the schemes (MIDH and RKVY) but most of them are not able to avail the schemes owing to lack of awareness and interest. To encourage the farmers, the markets need to be streamlined with more focus towards regular consumption of the produce which can be only possible if processing infrastructures can be strengthened.

Smt. Sangi, Superintendent of Horticulture, Kanchanpur (North Tripura)

Meeting revealed that the major obstruction which affects the interest of the farmers to increase production is the ignorance about new and improved technologies and cultivation practices. Currently there is no storage facility available in the district. The support schemes currently offered to the beneficiaries are:

• RKVY under which high density production is being undertaken in which the project amount is Rs 2,63,489/- with 50Y of assistance. There is a total of 8 hectares currently under the scheme.

• Similarly, under MIDH, a total of 6 hectares is currently under the project with project amounting to Rs 7,32,800/-

Meeting with Industry Anchor

Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India)

Gathered insights on the present functioning of DelMonte Processing Capabilities and pineapple value chain. The major processed products for pineapple by DelMonte which are available in India are mixed fruit juice, crush fruit juice, slices, cocktail, pineapple chunks, pineapple tidbits etc.

Coming to the procurement model of raw materials, Mr Bellani shared that most of the pineapple products were imported from Philippines as there are no available processing industry for pineapple in India by DelMonte. They did have some third-party tie ups but somehow didn't work out because of shortage of quality raw materials. The marketing channel of DelMonte includes both B2B and B2C model of distribution. Recently DelMonte products are also available through various E-Commerce portals.

There is some amount of processing going on in Karnataka as of now, but they are interested to setup a unit close to large production clusters with ample scope of transportation, electricity and other industrial facilities. They had also tried to setup units in Siliguri back during 2008-10 but failed in the process owing to shortage of quality raw materials and scattered production clusters. Procurement of raw materials from Tripura and other closer production cluster was also problematic owing to the issues in transportation and logistics along with labour related issues.

As of now the company is willing to invest in setting up the units as well as contribute towards training and capacity building of FPOs/Cooperatives who are interested to work with them. Company is also willing to carry out monitoring activities for various cultivation related issues during the process of pre harvest, harvest and post-harvest of pineapple. The organisation is also planning to explore options like pre-contracts in the near future.

Schemes & Policies

Tripura Industries (Facilitation) Act & Rules

The "Tripura Industries (Facilitation) Act, 2018" has been enacted to provide legal backing to the endeavour of the State Government on reducing the compliance burden and thereby improving the Ease of Doing Business (EODB) index of the State. A single window portal for the State has been launched for getting online single window clearance for the investors. The portal caters to the Industrial fraternity with the primary objective to simplify the processes and accelerate investment in the State.

A SWAAGAT Cell (Single Window Approval by All Government Agencies in Tripura) has also been setup in TIDC Ltd. to provide handholding support to the entrepreneurs.

- The Tripura Industries (Facilitation) Act, 2018
- Tripura Industries (Facilitation) Rules, 2020
- The Tripura Industries (Facilitation) (Amendment) Act, 2020
- The Tripura Industries (Facilitation) (Amendment) Rules, 2020

Tripura Industrial Investment Promotion Incentive Scheme, 2017[13]

Incentives for new MSME sector:

- Capital Investment Subsidy@ 30% on fixed capital investment subject to a ceiling of Rs.60 Lakhs per enterprises. For thrust sector industries, 40% with ceiling of Rs. 70 lakhs per enterprise.
- 15% Procurement Preference to local· industrial enterprises subject to 20% value addition
- Industrial Promotion Subsidy subject to an overall ceiling of Rs.60 lakhs per annum.
- 25% Reimbursement of Power Charges for 5 years, maximum Rs.12 lakhs per year.
- 4% Reimbursement of Interest on Working Capital Loans for 5 years, maximum 3.00 lakhs per annum.
- Reimbursement of Standard Certification charges/ fees/ expenses to eligible enterprises shall be paid one-time in full for standard certifications in 10 selected areas issued by National and International Bodies.
- 100% Exemption from the payment of Earnest Money and Security Deposits.
- Employment Cost Subsidy under thrust sector towards EPF and ESI contribution for 5 years on employment of 20 or more persons.
- Subsidy on fees paid for Credit Guarantee of loans.
- Export Promotion Subsidy @ 10% on value of export, maximum Rs. 20 lakhs per annum.
- Subsidy for participation in fares and exhibitions thrust sector industries.

Special Incentives:

[13] SWAAGAT (tripura.gov.in)

- Capital Investment Subsidy on substantial expansion @40% or 30%, maximum Rs.30 lakhs and Rs. 25 lakhs for thrust sector and other than thrust sector respectively.
- Industrial Promotion Subsidy @25%
- Partial re-imbursement of Power charges @15% of actual power charges paid after 5 years of operation, maximum Rs. 6 lakhs for employment in the range of 20 to 50 persons, Rs. 9.00 lakhs for employment in the range of 51 to 100 persons and Rs. 12 lakhs for employment of more than 100 persons.
- Employment cost subsidy with employment of 20 or more persons @ 50% of employer contribution paid towards EPF and ESI after 5 years of operation.
- Wages Subsidy on employment of 20 or more persons @ 20% of actual wages paid, maximum Rs. 2.50 lakhs per year.

The overall cap for benefits under all components of incentives will be of Rs. 200 crores per unit.

MEGHALAYA

Summary and Flow of the Report

The total production of pineapple in Meghalaya during 2019-20 was 1.3 lakh MT and accounted for nearly 8% of total production share for pineapple in India. Out of that total production in the districts surveyed amounts to 0.9 lakh MT which accounts for more than 70% of the total production in the state. The major varieties found in the state are kew, giant kew and queen. Queen is the most preferred variety and accounts for nearly 70% of the production in the state.

The following are some of the major gaps that are found in the overall value chain:

- Lack of knowledge of proper spacing and farming technologies by the farmer
- Scarce availability of skilled and affordable labour
- Fruit damage from pest and insect attacks owing to non-utilization of appropriate pesticides and insecticides
- Traditional cultivation practices hinder productivity and wastage of production also takes place due to lack of proper timed harvest
- Lack of awareness of commercialization of pineapple cultivation and prospects, with the farmers
- Social barriers in East/West Garo hills discouraging potential buyers
- Lack of irrigational facilities gives rise to crop loss during winter season
- Challenges in evacuation owing to lack of labour and hilly terrains
- Non-scientific harvesting
- High amount of wastage due to limited processing infrastructure
- No primary sorting or grading facilities for pineapple

Some of the specific recommendations in the report include:

- SOPs/BMPs to be devised in consultation with institutional buyers and processors
- Introduction to high density plantation in the hills
- Awareness about timing the harvest to minimise crop loss
- Introduction and wide spread implementation of contract farming models for farmers and interested buyers
- Awareness drives regarding existing schemes
- Training of farmers to time the harvest would be beneficial in curbing loss related to excess production during harvesting
- Continuous monitoring of available schemes needs to be done in the hilly and tribal areas owing to unawareness of the same by the farmers
- Training and creating market linkages through regular buyer/seller meets would strengthen the trade flow for pineapple in the state and beyond.
- Market linkage with neighbouring countries like Bangladesh, Nepal and Bhutan can be established
- Setting up collection centres at 8-10 kms vicinity of major production clusters like Ri Bhoi
- These facility needs to house primary processing units so as to add appropriate value to the product

- Export zones in high production areas like Ri Bhoi could be beneficial owing to the organic characteristics of the fruit in the region
- A minimum of 40 MT capacity unit needs to setup at Ri Bhoi, in order to convert the surplus production into an opportunity.
- Setting up of integrated fruit processing centres for Papaya, Jack fruit and Pineapple with a capacity of processing 1000 MT
- Development of Pineapple processing units with a capacity of 30000 MT per Annum Pulp Production as well as RTS /Juice production is required in Ri-Bhoi, West Garo hills.
- Districts like East Garo Hills can be integrated with PMFME scheme as comparatively the quantum of production is low as compared to other focus districts in the state and national average

Approach & Methodology

The Assessment Study for Pineapple focuses on identifying gaps in infrastructure & processing facilities for development of potential value chains for perishable products under Operation Greens Scheme of MoFPI. The study has adopted both primary and secondary research tools. Preliminary research was based on detailed desk review of relevant secondary literature and interactions with relevant stakeholders during inception and subsequent stages. Primary research and assessment were based on the qualitative data/information that was collected through government official interactions as well as cluster/field visits and consultations with different stakeholders such as farmers, traders, processors, exporters etc. along with different enabling and institutional stakeholders.

Study Area

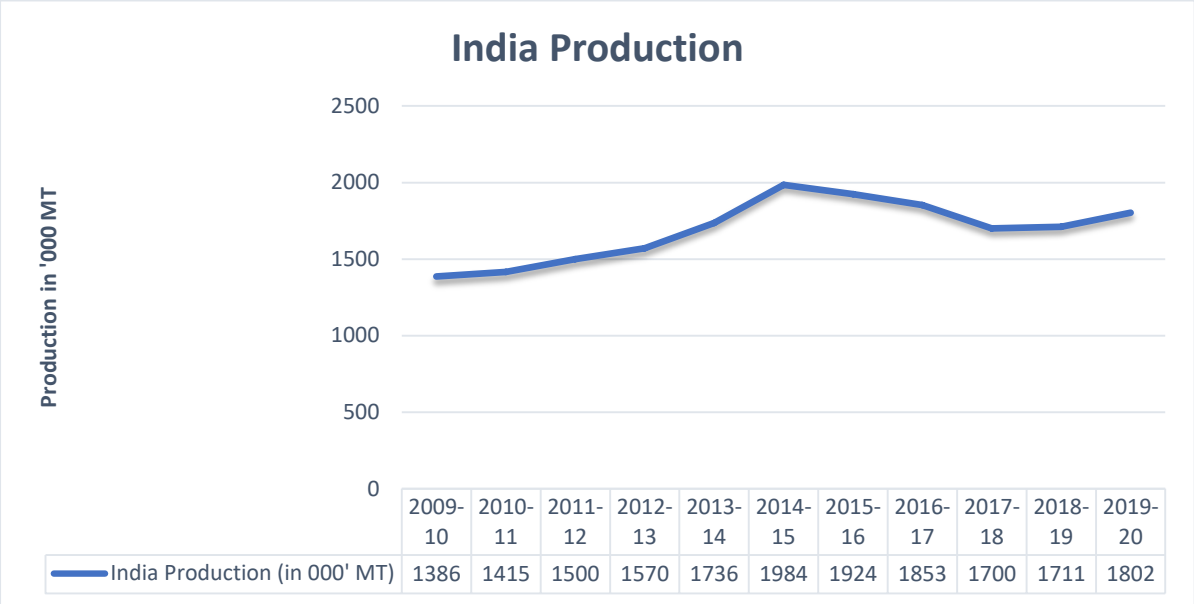
The following districts were taken into consideration for an in-depth study and gap analysis of pineapple value chain and their status of functioning which are prevalent in the state:

- Ri Bhoi
- East Garo Hills
- West Garo Hills

Pineapple Production & Trade flow in Meghalaya

Production in India

The total production of pineapple recorded by India in the year 2019-20 stands at 1802 thousand tones.



The above graph shows a gradual decline in production of pineapple following the year 2014-15. The reason as per the trend can be various factors, but the most crucial one of them would be decrease in area under cultivation for pineapple.

According to study and analysis, the region under the survey, especially the NER region contributes to approximately 40% of the total production of pineapple. Out of the total production from these areas approximately 90-95% of the production is organic in nature and cultivated through age old traditional cultivation practices.

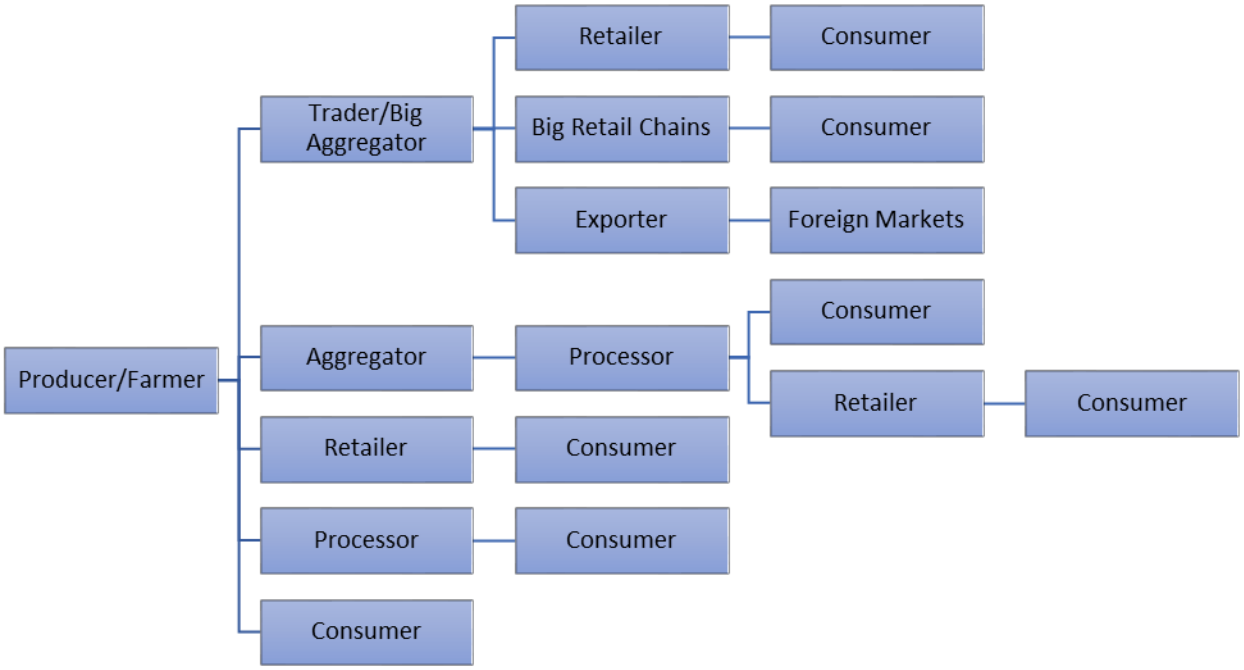
State wise Production

The table below shows the state wise production of pineapple in India.

Sl no.	State	2014-15		2015-16		2016-17		2017-18	
		Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)	Production (000 tonnes)	Share (%)
1	West Bengal	320	16.13	330.06	17.15	336.11	18.13	345.15	20.3
2	Assam	281.27	14.18	285.17	14.82	268.92	14.51	296.52	17.44
3	Karnataka	156.31	7.88	155.41	8.08	164.26	8.86	163.73	9.63
4	Meghalaya	124.6	6.28	123.13	6.4	140.95	7.6	144.73	8.51
5	Manipur	136.75	6.89	128.51	6.68	127.03	6.85	134.11	7.89
6	Nagaland	142.5	7.18	127.81	6.64	132.62	7.15	132.83	7.81
7	Tripura	170.89	8.61	180.26	9.37	94.67	5.11	127	7.47
8	Bihar	116	5.85	116.3	6.04	116.58	6.29	115.13	6.77
9	Andhra Pradesh	35.96	1.81	55.38	2.88	64.41	3.47	71.33	4.2
10	Kerala	348.06	17.54	305.67	15.89	310.32	16.74	69.72	4.1

According to the previous table, West Bengal is one of the highest contributors towards pineapple production in India followed by Kerala and Assam respectively. Meghalaya accounts for 8.51% of total production share for pineapple in India.

The below mentioned diagram depicts the market channels prevalent in India for pineapple value chain.

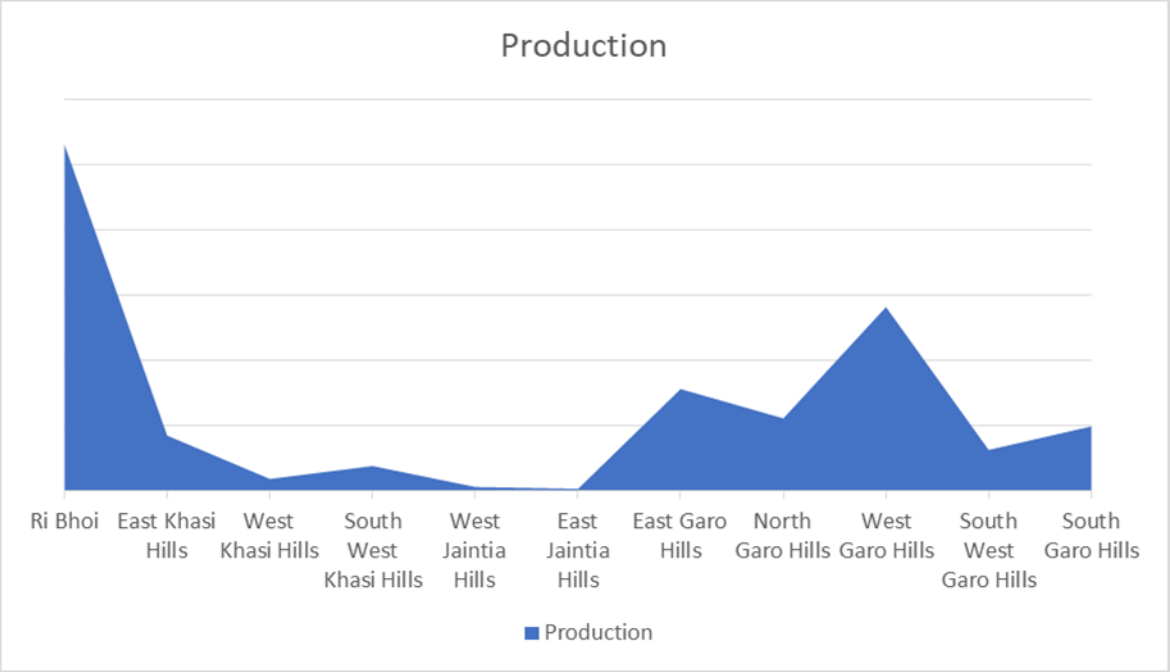


Meghalaya

Pineapple Production in Meghalaya

SL No	DIstricts	Area in Hectares	Production in MT	Productivity in kgs /hectare
1	**Ri Bhoi**	4063	53035	13053
2	**East Khasi Hills**	986	8433	8553
3	**West Khasi Hills**	260	1785	6865
4	**South West Khasi Hills**	556	3765	6772
5	**West Jaintia Hills**	64	552	8625
6	**East Jaintia Hills**	28	262	9357
7	**East Garo Hills**	914	15574	17039
8	**North Garo Hills**	533	11073	20775
9	**West Garo Hills**	2946	28149	9555
10	**South West Garo Hills**	618	6225	10073
11	**South Garo Hills**	1234	9848	7981
Total		**12202**	**138701**	**11367**

Source: Directorate of Horticulture, Meghalaya Data for 2019-20



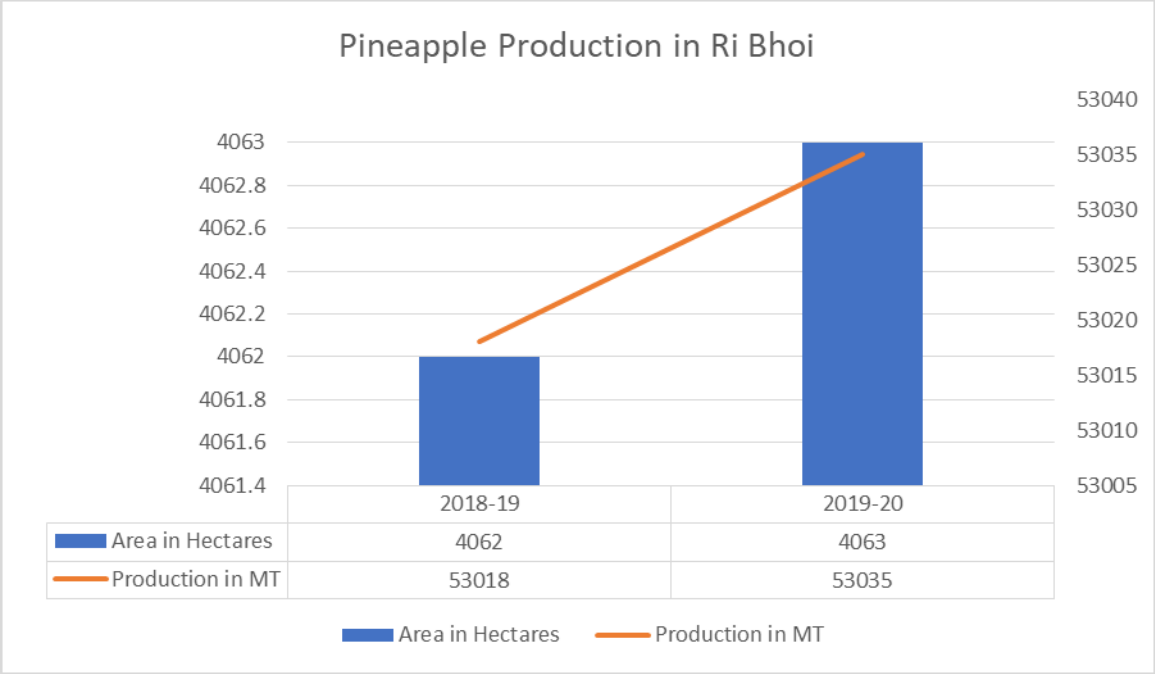
District Level Production

Following are the districts which were part of the assessment

Ri Bhoi

Ri Bhoi District came into existence and assumed the hierarchical status of the District on the 4th June 1992 by upgrading the former Civil Sub-Division. The District was carved out from the erstwhile East Khasi Hills District and lies between North Latitudes 25 15' and 26 15' and between East Longitudes 91 45' and 92 15'. It geographically comprises parts of the Khasi kingdoms viz parts of Mylliem Syiemship, Khyrim Syiemship, Nongspung Syiemship, Nongkhlaw Syiemship, whole of Nongpoh Sirdarship (erstwhile Nongpoh Syiemship), Myrdon Sirdarship and the erstwhile Nongwah Syiemship. Presently, the District is bounded on the North by the Kamrup, Morigoan and Nagoan Districts of Assam , on the East by the Karbi Anglong District of Assam, on the South by East Khasi Hills & West Khasi Hills Districts and on the West by the West Khasi District. Nongpoh is the District headquarter and as well as that of Nongpoh Sirdarship. Ri Bhoi District contains an area of 2448.00 Sq.KMS excluding the geographical areas under the erstwhile Nongwah Syiemship and other places which fall under the 'Areas of Differences' between Assam and Meghalaya.[14]

[14] https://ribhoi.gov.in/history-culture/



Source: Directorate of Horticulture, Meghalaya

Considering Meghalaya, Ri Bhoi district produced 53035 MT of pineapple. In Ri Bhoi, farmers sold 80% of their produce to the trader at the farm gate. The prices were Rs 17.5/- during lean season and Rs 15 during peak seasons per fruit. Queen is the most cultivated variety which accounted for 80 % of the produce in the district. Out of 53000 MT of produced pineapple, it was learnt that nearly 70-80% was traded through different marketing channels to the aggregators and traders. Approximately 100 MT of pineapple was processed and nearly 7900 MT was the wastage at farm level. It was observed that approximately 100 MT of pineapple out of the total production goes for minimal and secondary processing in Meghalaya. 10-15% of the total produce was sold at road sides by different farmer and retailers. Prior to the pandemic, govt arranged buyer/seller meetups for various commodities including pineapple (both state and district level interactions)

Trade Flow

Considering Ri Bhoi, the following is the market trade flow that is currently prevalent for pineapple:

Channel 1 (70%)

Farmer➔Aggregator/Trader in local villages➔Big trader/ vendors/ Wholesaler in distant markets➔Retailer➔Consumers

Channel 2 (15%)

Farmer➔Consumers (in road side semi-urban/urban markets and Wholesale market)

Channel 3 (5%)

Farmers➔Aggregators➔Processors

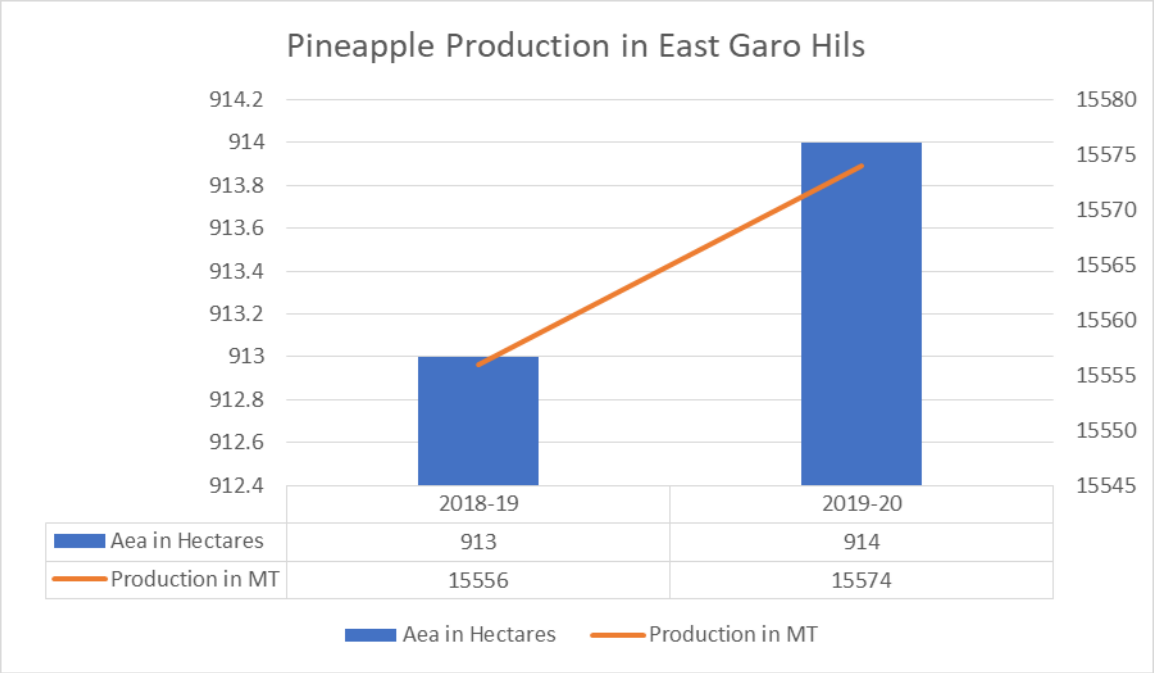
Channel 4. (10%)

Farmers➔Processors

Though some small scale processing happens in Meghalaya the total quantity which is currently going towards processing in the state accounts for merely 100 MT out of the total production that is 1.3 lakh MT.

East Garo Hills

East Garo Hills District was upgraded from a sub-division to a full-fledged district in 1976, after the erstwhile Garo Hills District was reorganised with a view to bring the administration closer to the people. In 2012 East Garo Hills District was further reorganised to form a new district, the North Garo Hills District, out of the erstwhile Resubelpara Civil Sub-Division. The District is bounded by South Garo Hills on the south, West Garo Hills on the west, West Khasi Hills on the East and North Garo Hills on the north. The new headquarter-complex is a neatly planned township. It has been christened as Williamnagar after Captain Williamson A. Sangma, the first Chief Minister of the State of Meghalaya. Williamnagar now has all the amenities of a modern town and is the largest growth centres in Garo Hills, next to Tura.[15]



Source: Directorate of Horticulture, Meghalaya

Considering East Garo Hills, the district accounted for 15574 MT of pineapple production in the year 2019-20. The farmers here were seen having contracts with various local and outside traders which helped them market their produce. Though the prices were below market standards as it went down sometimes below Rs 10/- per piece however contract model of farming ensured definite marketing of the produce which also minimised the losses at the farm. Williamnagar is the local market place in the district which caters to sell of the produce majorly. The traders were seen procuring and picking the produce from the farm themselves and sometimes also employed labour to do so. It was learnt that unlike Ri Bhoi most of the produce from the district were traded as fresh fruit and majorly found its market in Shillong, Guwahati, Silchar and states like West Bengal and Odisha. 20% of the

[15] http://eastgarohills.gov.in/history.html

produce was directly sold by the farmers at road side markets. There were no value addition or processing centres found in the district.

Trade Flow

Considering East Garo Hills, following were the market channels that were prevalent in the district as found out from survey and primary interactions at the grass root level:

Channel 1 (80%)

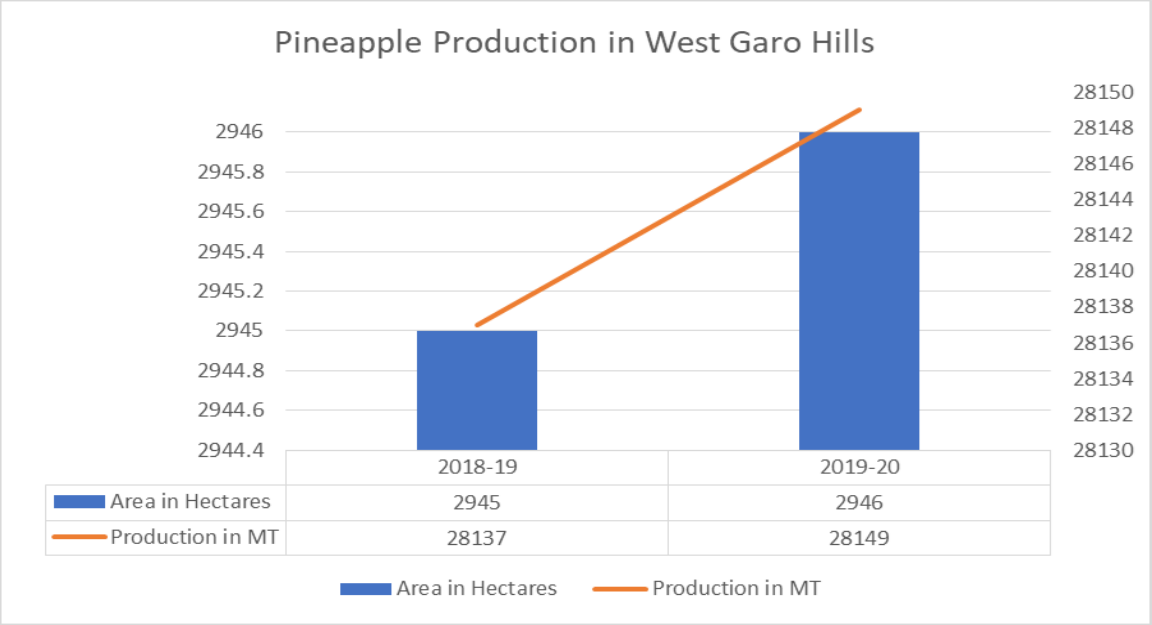
Farmer➔Precontractor/Trader➔Retailer➔Consumer

Channel (20%)

Farmer➔Local Haats➔Consumer

West Garo Hills

West Garo Hills is one of the largest district of Meghalaya located in the western part of the State. The Garo Hills district was divided into two districts, viz the West Garo Hills district and the East Garo Hills district in October 1976. The erstwhile West Garo Hills district was further divided into two administrative districts of West and South Garo Hills on June 1992. The district headquarters of West Garo Hills is Tura, which is the second largest town in the State after Shillong. The West Garo Hills district lies on the western part of the state of Meghalaya bounded by the East Garo Hills district on the east, the South Garo Hills on the south-east, the Goalpara district of Assam on the north and north-west and Bangladesh on the south. West Garo Hills district is pre-dominantly inhabited by the Garos, a tribe with a matrilineal society belonging to the Bodo family of the Tibeto-Burman race tribes. Other indigenous inhabitants are the Hajongs, Rabhas, Koches, Rajbansis, Meches, Kacharis and Dalus. The district is also inhabited by Bengalis, Assamese, Nepalese, Marwaries, Biharis and people from other parts of India.[16]



Source: Directorate of Horticulture, Meghalaya

[16] http://westgarohills.gov.in/profile.html

West Garo Hills accounted for a total production of 28149 MT of pineapple in the year 2019-20. Similar to East Garo Hills farmers here were also seen practicing pre-contract method of selling the produce. Considering the proximity of both the districts, farming and harvesting methods are mostly similar. Tura is the major marketing and aggregation point for pineapple in West Garo Hills where it was found that the farmers who were not involved in farm gate selling or the produce which was not sold through the farm gate were stacked in open markets for selling. According to them, though this process was more time consuming and difficult, taking into consideration plucking the produce from the hills and bringing them to the market themselves, the method helped them fetch better prices. Some of them also claimed that they received Rs 20-25/- per piece and that too during peak harvesting. There was no value addition or processing centre found in the districts.

Trade Flow

Considering West Garo Hills, following were the market channels that were prevalent in the district as found out from survey and primary interactions at the grass root level:

Channel 1 (80%)

Farmer➔Precontractor/Trader➔Retailer➔Consumer

Channel (20%)

Farmer➔Local Haats➔Consumer

Infrastructure Assessment and Gaps

Production end

Pineapple cultivation is done on the slopes of Ri Bhoi, East/West Garo Hills. Though both Queen and Kew are the major varieties in the state, queen variety accounts for nearly 80% of the total production. Surveys revealed that majority of the farms in Garo hills did not follow proper spacing during plantation of the fruit crop.

Lack of skilled and affordable labour for harvesting was the major concern of the pineapple farmers. As harvesting of pineapple is a labour intensive activity, lack of the same always resulted in damage of the fruits without being harvested.

Other factors such as fruit damage, pest and insect attacks and other plant related diseases accounted for nearly 3-5% of farm level losses. The major reason being, the farmers were not aware of the pesticides, insecticides and fertilizers that are available in the market and most of them were practicing traditional cultivation practices in the interest of growing only organic varieties of pineapple.

Most of the farmers took either hand loans or invested from their own. They were not aware of any specific credit linkage schemes as they mostly do not travel outside the clusters. Most of the farmers though consider this as their source of income but have no idea or awareness of its commercialization in the clusters like East Garo/West Garo Hills.

Though Meghalaya receives ample rainfall, still owing to the sloppy terrains water also recedes quickly from the orchards. This in turn affects cultivation during winters. Lack of availability of irrigation facilities was one of the major concerns of the farmers.

Post-Harvest

Pineapple is mostly harvested during the month of May to July which happens to be the peak season and during this the farm gate prices vary from Rs 10-15/- per piece.

Evacuation was another major concern both for the farmer as well as the traders/aggregators involved in the value chain. The hilly terrains and uneven orchards plays a hindrance in harvesting and evacuation. Moreover it was seen as one of the major contributors to the farm related losses. As most of the fruits couldn't be harvested on time.

Most of the pineapples was evacuated in bamboo baskets from the farm to plains or place of collection of the produce. It was also seen that some of the farmers have created their own stacking points in districts like East/West Garo hills, however these points don't have any infrastructural facilities. Then was loaded on to buses/minivans/trucks and traded in the market. Though the farmer didn't bear the cost of transportation, still there was a significant cost escalation of Rs 10-15/- per piece of pineapple and was traded at the market close to Rs 30/- per piece.

The major marketing clusters in Meghalaya for pineapple are:

- Khliehriat (East Jaintia Hills)
- Shillong & Sohra (East Khasi Hills)
- Nongpoh (Ri Bhoi)
- Dadengiri, Rongram & Tura (West Garo Hills)
- Jowai (West Jaintia Hills)

There are two regulated markets each in East Khasi Hills and West Garo Hills but none of them as of now deal in pineapple.

Considering Nongpoh market in Ri Bhoi, the prices kept fluctuating. According to the latest information, the prevalent prices hover around Rs 14-18/- per piece. Similarly, at Dadengiri, Rongram & Tura the prices were Rs 20-23/-, Rs 40-42/- and Rs 28/- as per the information provided by different traders who sell and procure from the markets regularly.Traders are majorly from Assam, Jaintia Hills and Khasi hills who procure pineapple from the farm gate.

Processing

Considering the state and the focus districts, processing was not the strongest point for pineapple as of now. Comparatively Ri Bhoi has advantage both in terms of location and infrastructure. Comparing the other districts, produce from Ri Bhoi was considered mostly for processing both because of the quantum of produce and variety.

Districts of East and West Garo hills lacked infrastructure related to processing of pineapple. The major reason was erratic electrical infrastructure and lack of proper transport infrastructure in these districts. Garo hills also witnessed social disturbances which discouraged many outside/non local investors to invest in enabling initiatives and interventions in the district.

Present Status

Most of the processing industries were concentrated in Ri Bhoi and Khasi Hills/Shillong. The processing infrastructures include six multi-food processing units, which include pineapple as one of the commodity of which; two are public sector and four private sector units.

Annual Process Capacity in MT	No of Units	Total Capacity	Utilized capacity
500-1000 MT	2	1200 MT	60 %
100-500 MT	2	550 MT	55 %
Less than 100 MT	2	20 MT	70 %

Although these processing industries are setup they were not able to operate with full operational efficiency owing to erratic raw material supply. It was observed that the raw materials which were procured by the processing units were mostly leftovers during harvesting which couldn't be traded as fresh fruit and the farmers finally sold these to the processors at comparatively very low price. This also affected quality of processed products.

Recommendations

Considering the above assessment of the overall value chain and infrastructure capabilities of the state, existing processing is very low. Major gaps were found with the production and continuous supply of pineapple to the market and industries. Challenging terrain and lack of all-weather roads is also a major issue considering harvesting and evacuation of the crop which makes it difficult to be competitive, and therefore the major strategies should focus on improving economies of scale, production quality standardisation and proper branding & marketing of the produce.

So it was observed that rather than only uplifting the existing processing, a holistic development needs to be done in terms of other infrastructures as well. Only with such substantial changes, both trade and processing would take a significant leap.

The following are some of the recommendations that are made accordingly, highlighting suggestions at each leg of the value chain.

Production end

Best Management Practices (BMPs) could be devised in consultation with interested processing industries/institutional buyers and horticultural experts to minimise gaps related to quality and varietal availability of the fruit.

Introduction of high-density plantation would also be beneficial in terms of increasing production per hectare along with standardization of fruit.

Along with ensuring implementation of the Best Management Practices, contract farming by major buyers will ensure market availability for the farmer as well as the trader and would encourage farmers to follow the BMPs.

Awareness drives regarding existing schemes needs to communicated to the farmers in an optimal manner as it was seen that many of the farmers in the far away tribal regions such as East/West Garo hills have no knowledge regarding existing infrastructure and schemes and hence resort to farm gate selling of the produce.

Post-Harvest

Farmers were seen facing huge losses on the field. Training of farmers to time the harvest would be beneficial in curbing loss related to excess production during harvesting. Apart from damages at farm/orchard level there were significant damages during transportation. Proper loading of the pineapples by keeping the crown upside down would lessen the effect of damages during transit.

Though there is provision in the state in form of **Integrated Technology Enabled Agriculture Management System Or iTEAMS** to help farmers get better price realization through implementation of market intelligence, the ground usability wasn't found during the surveys. Continuous monitoring of the said scheme would be really beneficial for the farmers, traders and processors alike. Enrolment of the farmers in the scheme and regular interactions would serve the purpose and help the scheme achieve its core competency.

Training and creating market linkages through regular buyer/seller meets would strengthen the trade flow for pineapple in the state and beyond.

Setting up collection centres at 8-10 kms vicinity of major production clusters like Ri Bhoi would give the interested buyer a platform to procure the produce from one place rather than going to the orchards. These facility needs to house primary processing units so as to add appropriate value to the product and lessen the burden of institutional buyers thereby minimizing rejections at the point of final collection of the produce.

Export zones in high production areas like Ri Bhoi could be beneficial owing to the organic characteristics of the fruit in the region. Organic pineapple has also got huge demand in international markets, so branding and appropriate marketing of the same would be beneficial for the fruit and bring in future investments.

Processing

A minimum of 40 MT capacity unit needs to setup at Ri Bhoi, in order to convert the surplus production into an opportunity. It was learnt that previous year owing to the pandemic and other social disturbances, nearly 7900 MT of pineapple in Ri Bhoi got damaged in the field itself which accounted to nearly 14% of wastage. Wastage in value was Rs 6 crores worth of product which would have been processed and value addition could have been done.

Now looking at the availability of other fruits, development of integrated fruit processing centres for Papaya, Jack fruit and Pineapple with a capacity of processing 1000 MT fruits per Annum would make the unit efficient and cut down operational cost owing to continuous supply of all the fruits round the year.

Setting up of pulp/RTS units would also help in increasing the shelf life and make the processing industries ensure continuous raw material supply. This would minimise the escalated cost of procurement related to lack of transportation and untimed harvesting of the fruit.

Context & Interventions

The pineapple harvesting season in Meghalaya starts from June and goes on till December. The typical harvesting practices include evacuating manually from the orchards by the farmers and sometimes by the traders/buyers. As harvesting of pineapple is a labor-intensive activity, farmers in the districts generally couldn't find affordable labour and carry out the harvesting manually. However said that, it was found that farmers in East/West Garo Hills practiced contract method of cultivation in which the traders had a legal contract with the farmers generally signed in the month of December for the next harvesting. Though standardization of the harvested produce was still sometimes an issue during the transaction, the traders sometimes employed labours themselves and plucked the fruits from the orchard directly. The fruit is collected in a basket made of bamboo and then evacuated from the fields. This results in very low quantum of the produce being harvested in a day which comes to around 100 pieces per person. This results in on field damage of the crop and some farmers reported that the damage was close to 15-20% of the total harvests as reported by the farmers. Farmers in Ri Bhoi mentioned that the fruit damages also sometimes exceeded 20% as there was no scientific plantation method and harvesting all fruit at once was not possible.

Considering transportation, the major problem is with the availability of last mile connectivity of roads till the farms and lack of all-weather roads. But we are not considering any interventions for the same here. Because of the above road conditions, the time taken for the produce to be transported from districts like East & West Garo Hills to Shillong sometimes take around 8-10 hrs and more during monsoons (Peak Harvesting). During such transit, majority of the produce (5-8%) gets damaged due to lack of proper road infrastructure and hilly terrains, which adds up to the overall loss in the commodity flow. The peak harvesting happens during monsoons which makes the transportation even more difficult. During such seasons the vehicles get stranded some time 1-2 days, which in turn adds up to the damage of the fruit and transportation related losses. As found out from the survey and stakeholder interactions, some of the vehicles that has been part of the 1917 Transport are based out of Tura only which is in West Garo Hills. There are presently five trucks under the scheme, however all the vehicles are in Tura. This affects the overall usage of the vehicles by other district in need. There were currently no insulated/reefer vehicles found functioning in any of the districts.

Similarly considering marketing of the produce, the farmers mostly prefer farm gate selling as individual contribution to the total quantum of harvesting is very low. Most of the traders and aggregators go to the farm gate to collect the produce and fix the price solely on visual inspection. Some contracts by the traders though specified verbally the size of the produce and when to be harvested. Absence of any sorting or grading facilities at block or district level, forces the farmers to sell their produce as a lot and mostly at a very low price (Rs 10-12/-) especially during peak harvesting. This was more prevalent in district of Ri Bhoi.

Processing of pineapple in Meghalaya is at a very nascent stage. Most of the pineapple is consumed as fresh fruit in the state and the rest finds its market through aggregators and traders to other nearby states such as Assam, West Bengal and Odisha. Some of the processing units as mentioned above were only found at Ri Bhoi and Shillong. Collective quantum of consumption of raw material by those units for pineapple amounted to approximately 100 MT which 0.07% of the total produce of the state. Therefore the state has got immense scope for processing of pineapple.

The above gaps are calling for interventions in the form of cold storages, driers, reefer vans, primary processing/minimal processing units and secondary processing units. Other than the above which are mostly infrastructure related, there are other gaps that needs to be addressed in order to facilitate effective use of infrastructure. Both types of initiatives need to go hand in hand.

District	Recommendation with indicative units	Why are we making the recommendation	How implementable is this recommendation	Indicative Costing (in Lakh x unit)	Investment Interest	Remarks
• **Ri Bhoi**	Mobile Pre-cooling Units (2 in Ri Bhoi) for Nongkhrah, Marngar especially looking at scale of production	• No precooling infrastructure available • Transportation of the produce is affected due to monsoons and bad weather	Short term	25 x 2 = 50	FPOs, Cooperatives, and Big Farmers	In terms of investment interest, some farmers have shown interest as of now for

						mobile precooling units provided they would get it either fully subsidized or subsidized more than 75%.
• **Ri Bhoi**	Farm level sorting and grading facilities – 1MT/hr (5 units)	• No scientific method of pricing is followed. • Farm gate prices are sometimes only 20-30% of the retail price	Short term	15 x 5 = 75	FPOs, Groups and Small industries	Farm level grading and sorting is a necessary interventi on as most of the farmers practice farm gate selling here without any scientific method of pricing
• **Ri Bhoi**	Canning line for fruit pulp 2TPH (1 unit)	• Minimal processing like canning may reduce the overall loss in the value chain flow	Short term	67 x1 = 67	MSMEs and Large Industries (Assumed)	Although there were some processin g industries found in the district still huge amount of pineapple (approx. 7900 MT) was the wastage last year. Canning would help preserve the pineapple in long term and act towards streamlini

						ng the raw material supply for industries.
• **Ri Bhoi**	Spray drier units 2 units for the district	• Dried & powdered pineapple are known to have better price realization. • Will be a viable model considering the quantum of produce	Long term	155 x 2 = 310	MSMEs and Large Industries	Though there were no significant investment interest found for spray drier units as of now we have suggested this as a long term plan of intervention
• **Ri Bhoi**	Fruit pulper (100 kg/h) to be provided at district level Minimum 8 no.s to be provisioned for block level operations for each block	• Pulping is one of the techniques to increase shelf life of the commodity and make it processing ready • Pulping would help in long term utilization as a raw material for industries	Short term	0.79 x 8 = 6.32	Individual big farmers, FPOs and Cooperatives	
• **Ri Bhoi**	Reefer vans 1600 kg to be provided at district level – 5 for district	• It was observed that losses during evacuation and transportation was sometimes 15-20% as per our interactions.	Short term	3.60 x 5 = 18	FPOs, Big Farmers, Transporters, MSME and state government	Currently absence of such intervention like reefer vans limits the evacuation quantum and adds up to the damage. Some of traders were found interested for such interventions
• **Ri Bhoi**	Refrigerated containers 10-20 tons capacity to be provided at district level – 2 no.s to be provisioned	• For long distances open trucks are used which expose the pineapples to harsh weather	Short term	8.00 x 2 = 16	Transporters and Big traders	Apart from the above refrigerated containers

		conditions and most of the fruits get damaged or become unfit for consumption				have also been suggested owing to the proximity of the district to Guwahati and short term interventions of refrigerated containers would help in minimizing on farm losses
Total Cost of Intervention (Indicative)				**542.32**		

Districts	Recommendation with indicative units	Why are we making the recommendation	How implementable is this recommendation	Indicative Costing (in Lakh x unit)	Investment Interest	Remarks
• **East Garo Hills** • **West Garo Hills**	APEDA certified Integrated Packhouse 1 TPD capacity (2 no.s) 1 in each district	• 70-80% is organic • No pack houses available	Long term	50 x 2 = 100	Large industries, HNI individuals and Warehouses	Though there were no significant interest found for investing in pack houses but everybody we interacted with agreed that this intervention would hugely benefit the value chain
• **East Garo Hills** • **West Garo Hills**	Mobile Pre-cooling Units (2 no.s) 1 in each district	• No precooling infrastructure available • Transportation of the produce is affected due to monsoons and bad weather • No storage facilities available in the	Short term	25 x 2 = 50	FPOs, Cooperatives and Big Farmers	

		districts				
• **East Garo Hills** • **West Garo Hills**	Farm level sorting and grading facilities – 1MT/hr (5/district)	• No scientific method of pricing is followed. • Farm gate prices are sometimes only 20-30% of the retail price	Short term	15 x 10 = 150	FPOs, Groups and Small industries	Such infrastructure are completely nonexistent and are needed in order to standardize the product quality
• **East Garo Hills** • **West Garo Hills**	Spray drier units 1 for each district	• Dried & powdered pineapple are known to have better price realization. • Will be a viable model considering the scope of the product	Long term	155 x 2 = 310	MSMEs and Large Industries	Spray drier units may be considered as a long term intervention keeping in mind the market for powdered products
• **East Garo Hills** • **West Garo Hills**	Fruit pulper (100 kg/h) 10 units to be provided at district level Minimum 5 no.s to be provisioned for farm level operations per district	• Pulping is one of the techniques to increase shelf life of the commodity and make it processing ready • Pulping would help in long term utilization as a raw material for industries	Short term	0.79 x 10 = 7.9	Individual big farmers, FPOs and Cooperatives	Fruit pulpers would help the farmers and traders minimize the loss they face due to transit. This would also act as a interest factor for industries to procure raw material round the year
• **East Garo Hills** • **West Garo Hills**	Reefer vans 1600 kg to be provided at district level – 5 for each district	• It was observed that losses during evacuation and transportation was 8-10%.	Short term	3.60 x 10 = 36	FPOs, Big Farmers, Transporters, MSME and state government interventions	Most of the traders were interested in such initiative and this would help the product

						minimize losses due to bad weather conditions during transit
• **East Garo Hills** • **West Garo Hills**	Refrigerated containers 10-20 tons capacity to be provided at district level – 2 for each district	• For long distances open trucks are used which expose the pineapples to harsh weather conditions and most of the fruits get damaged or become unfit for consumption	Long term	8.00 x 4 = 36	Transporters and Big traders	
Total Cost of Intervention (Indicative)				**689.90**		

Hence the total indicative cost of intervention adding up for both the clusters amounts to 12.32 crores. However these interventions would only be fruitful and possible to implement only if some of the enabling infrastructures are streamlined.

Areas like East Garo/West Garo Hills and some of the blocks in Ri Bhoi are facing challenges regarding erratic electricity supply. This discourages majority of the investors to setup units as they would have again to invest in generators or solar units to run their units to its full potential. Apart from that the roads in East Garo and West Garo hills are affected during monsoons given that peak season for the product is during monsoons. As per stakeholder discussion it was learnt that road efficiency drops down to 30% during the peak season of harvesting in monsoons. So though we are recommending the above interventions these loop holes also needs to be taken care of in order to generate more interest in such projects and interventions.

Therefore we would also recommend including districts like Garo Hills, especially East Garo Hills in to PMFME scheme to streamline the overall value chain before looking into hard interventions through Operation Greens.

Government Interactions

Iaskhembor Majaw, Assistant Director of Horticulture, Ri Bhoi

Farmers in general carry out manual grading and sorting at field level. As far as information with the department is concerned, there is no packaging done as of now by any of the farmers or any local agencies. A constituted stockyard has also been setup in the state. As per current estimates, 100 MT of pineapple is processed at state level. Recent intervention has been done in terms of cold storage by Saura Mandala Trust. RRTC & Meg processing unit are some of the secondary processing units in present in the state. PMFME, MIDH and RKVY are some of the prevalent schemes in the state. We also got to know that there has been one application received under ODOP (One district one product). In terms of marketing support, the department has been actively conducting Buyer Seller meets with active participation from different local and outside buyers. Buyer seller meet up have also started at district level from 2016 onwards. Most of the roads are kutcha in nature which makes evacuation and transportation an issue. The only NAAC testing facilities that are available are in Guwahati and Kolkata. Suggestions included setting up of cold storages and farmer markets in the urban areas. Apart from that awareness on the use and benefits of insulated vans is also a necessity.

Mr Balawanmon Keri, Asst Director of Horticulture, Nongpoh

Packhouses have been constructed in several villages under MIDH scheme. However these pack houses are small in dimension with a total capacity of below 5 tonnes. Pineapple sold within the state and to neighbouring Assam are transported without any packaging. A stockyard (permanent) with GU sheet and cement that measures 65x20sq ft has been recently constructed at Mawphrew village, Umling block. Secondary processing units (approved) will be coming up at Mawphrew, Plasha & Pahmbirlum under article 275 of the constitution of India MOVCDNER & RKVY schemes. SavourIt Food Processing Unit. State level buyer-seller meet has been organised in 2020. Several private buyers/exporters including companies from different states of India attended the programs facilitated by the department. 1917 iTeams provide 5 vehicles for transportation of the produce at subsidized rates. Collection and Aggregation centres are required at block level to streamline the value chain. Regarding commodity flow, it was learnt from the department that due to the lack of any official regulation of the pineapple sector, it is difficult to provide any specific details on the product flow in the market. The processing variety and traditionally grown by farmers of Ri-Bhoi is the Giant Kew. Focus should be drawn towards the health benefits of pineapple and the growing trends of health products.

Nathaniel Shadap, Asst Director of Horticulture(Marketing), East Garo Hills

The district is distributed into 8 clusters spread over 4-6 villages. One processing unit in Songsak block is underway. The department is aggressively promoting PMFME scheme and also giving subsidized machinery. The state needs better marketing infrastructure. Under the Agriculture Marketing Scheme, the department supports the farmers, at a 50% subsidy, with marketing items like weighing scales, plastic crates, storage bins. A Farmer's Market has been set up in Williamnagar with funds from the Meghalaya State Marketing Board. A cold storage room had been installed (NEC scheme) in 2019 with a holding capacity of 10 tons and the Market Committee had recently this year

been empowered to look into its functioning. Erratic electricity plays a major hindrance in the holistic development of various value chains. Queen variety is abundantly found in the district.

Shri Maxpemberton D Arengh, District Horticulture Officer, West Garo Hills

It was often observed that middle men, traders and aggregators are involved in the harvesting of the produce directly from the farms. Majority of the produce is sold from the farm gate. Pre contract farming has been prevalent in the state from last 3-5 years. Department has been supporting in farming and plantation activities. Produce from the district is generally sent to Dainedubi for processing which can only handle 30 MT annually. A cold storage is recommended to setup that can atleast handle 500 MT of produce. Need to add up more vehicles under the 1917 iTeams scheme.

Siljang Sangma, District Horticulture Officer, East Garo Hills

Only five packhouses out of fifty are available in the pineapple clusters. Currently some small scale farmers are involved in processing activities in the district and process jams and jellies. Currently three FPCs are at initial stage and will be operational in a year or two. Government is continuously monitoring the service providers. Department supports the farmers by providing planting materials and bio pesticides. There is a dire need of provision of plastic crates in order to avoid losses during transit. Though cold storage provision of 10 MT capacity is already available at the farmers market, the facility is currently not being availed by the farmers. Queen variety accounts for 90% of the total produce in the district.

Industry Mentor

Mr. Yogesh Bellani, CEO & Director, FieldFresh Foods Private Limited (DelMonte India)

Gathered insights on the present functioning of DelMonte Processing Capabilities and pineapple value chain. The major processed products for pineapple by DelMonte which are available in India are mixed fruit juice, crush fruit juice, slices, cocktail, pineapple chunks, pineapple tidbits etc.

Coming to the procurement model of raw materials, Mr Bellani shared that most of the pineapple products were imported from Philippines as there are no available processing industry for pineapple in India by DelMonte. They did have some third-party tie ups but somehow didn't work out because of shortage of quality raw materials. The marketing channel of DelMonte includes both B2B and B2C model of distribution. Recently DelMonte products are also available through various E-Commerce portals.

There is some amount of processing going on in Karnataka as of now, but they are interested to setup a unit close to large production clusters with ample scope of transportation, electricity and other industrial facilities. They had also tried to setup units in Siliguri back during 2008-10 but failed in the process owing to shortage of quality raw materials and scattered production clusters. Procurement of raw materials from Tripura and other closer production cluster was also problematic owing to the issues in transportation and logistics along with labour related issues.

As of now the company is willing to invest in setting up the units as well as contribute towards training and capacity building of FPOs/Cooperatives who are interested to work with them.

Company is also willing to carry out monitoring activities for various cultivation related issues during the process of pre harvest, harvest and post-harvest of pineapple. The organisation is also planning to explore options like pre-contracts in the near future.

Schemes

Integrated Technology Enabled Agriculture Management System Or iTEAMS

Actual Level of usage:

With our limited access to the survey and farmer interaction we found out that no farmer yet has availed the service or has any information regarding the same.

Objectives:

Addressing the critical issue of enabling and facilitating access to remunerative and sustainable markets for farmers produce in the most transparent and effective manner through facilitation service iTEAM Dial 1917, whereby farmers can be assisted on the following activities:

- 12/6 Physical Connectivity to Markets.
- Access to input suppliers and bidders.
- Tailor made advisory solutions on crops, Package of practices, Animal Health Care, etc.
- Assured logistics and Transport solutions at the rate of 0.20/kg/km.
- Livelihood options through leasing Agri Response Vehicle.

Type of Assistance and Entitlement

- Telephone advice
- Free mobile sms to registered farmer
- Transport service to evacuate farmers produce to markets at the rate of INR 2.00 per KM per Quintal.

Eligibility and Selection

- Available to all farmers
- Buyers have to register

FRUIT PROCESSING CENTRE

Objectives:

To disseminate technical knowhow to youths entrepreneurs, farmers and housewives through practical demonstration on the importance of fruit preservation. To manufacture quality processed fruit products such as Squashes, Jams, Jelly, canned fruits and Juices under the trade name Meg fruits products.

Type of Assistance:

Awareness, Capacity building on fruit and vegetable processing

Meghalaya Industrial & Investment Promotion Scheme, 2016[17]

Validity:

[17] https://megindustry.gov.in/policy/MIIPS_2016.pdf

Upto 20th December 2022

Eligibility:

A unit becomes eligible for the subsidies/incentives/benefits provided that:

- A unit employs local tribal (Khasi/Garo/Jaintia/any other ST recognized by the Government of Meghalaya) people not less than 60 % of the total employee strength of the enterprises. The enterprise will have to follow the minimum wage policies of the Govt. of Meghalaya.
- Its registered office is located within the State of Meghalaya.

For Micro/Small Enterprises:

State Capital Investment Subsidy:

(a) State Capital Investment Subsidy on cost of Factory Building & Plant & Machinery for Micro Enterprise @ 35 % (thirty five percent) subject to a ceiling of 7.00 lakh

(b) State Capital Investment Subsidy on cost of Factory Building & Plant & Machinery for Small Enterprises @ 30 % (thirty percent) subject to a ceiling of 75.00 lakh

2. Subsidy on the cost incurred for Feasibility Study and Project Reports:

100 % subsidy on the cost incurred on preparation of Feasibility/Project Report subject to a maximum of Rs.50000.00 for Micro Enterprise and 1.00 lakh for Small Enterprises.

3. Development Subsidy:

Subsidy @ 75 % on charges payable to statutory bodies for any permission or Registration and (b) Subsidy @ 75 % on procurement of know-how from a well-established and approved Research and Development Organization subject to a total ceiling of 3.00 lakh

4. Interest Subsidy:

Subsidy @ 4 % on interest paid to Banks/Financial Institutions with a ceiling of 1.00 lakh per annum on term loans (excluding working capital loans) availed by an entrepreneur for setting up of Micro & Small Enterprises for a period of 5 (five) years from the date of disbursement of loan.

5. Subsidy on Power:

(i) Subsidy @ 30 % on power tariff for loads up to 2 MW for a period of 5 (five) years from the date of commercial production for manufacturing process only subject to a ceiling of 25.00 lakh per annum.

(ii) Subsidy @ 50 % on the cost of Generating Sets including Non-Conventional/Renewable Energy Generating Sets, subject to a ceiling of 20.00 lakh for all categories of enterprises set up in rural/urban areas.

(iii) 100 % subsidy on drawal of power line of 20 KV and above including cost of transformer(s) subject to a maximum limit of 10.00 (ten) lakh provided that the location has been approved by the Government.

(iv) 50 % subsidy on the cost incurred on service connection (excluding internal wiring) subject to a maximum of 2.00 lakh.

6. Subsidy on cost incurred on Quality Control Measures:

Subsidy @ 50 % on cost of Laboratory Equipment for the purpose of quality control and ISI/BIS certification subject to a maximum of 5.00 lakh.

7. Price preference:

Price preference in accordance with the existing Meghalaya preferential Stores Purchase Rules, 1990 will be allowed for all eligible manufacturing units only.

8. Reimbursement of Stamps Duty & Registration Fees:

Subsidy @ 75 % of the applicable Stamp Duty & Registration Fees in execution of deeds of conveyance/mortgage pertaining to loans from Financial Institutions and Banks within the State of Meghalaya subject to a maximum of 3.00 lakh.

9. Enterprises owned by Women & Physically Challenged persons:

Additional subsidy @ 10 % on the cost of Factory Building and Plant & Machinery subject to a ceiling of 5.00 lakh. Physically challenged persons will pay only 50 % of the applicable lease rent if allotted land/shed/shop in Industrial Area/Industrial Estate/Growth Centre.

10. Enterprises set up by Tribal entrepreneur:

Enterprises set up by Tribal entrepreneur will get preference in allotment of land/shed in the industrial area/estate with concession of 25 percent of the prevailing rate in lease rent.

11. Sales Tax/VAT Remission:

The State Government shall provide 99 % Sales Tax (MVAT) remission to eligible industrial units on sale of finished goods/by products within the State for a period of 7 (seven) years from the date of commencement of commercial production. Accordingly, the unit shall pay 1 % of the tax amount payable in accordance with tax return under MVAT to the State Government. Similarly for sale of goods/by products between interstate the unit shall be eligible for remission of 99 % of the CST amount as applicable and shall pay only 1 % of the tax amount under CST to the State Government for sale of finished goods / by products to any registered dealer/customer and submit “C” form wherever applicable. All new & existing units undergoing expansion of 25 % or more shall be eligible for exemption for the further period of 5 years.

In case GST becoming applicable during the tenure of this Policy, the above said concession shall be extended to State GST only.

12. Refund of Central Sales Tax (CST) :

100 % subsidy on the amount of CST actually paid on purchases of such machinery and equipments which are genuinely required as is installed upto the date of commissioning of the unit subject to a

ceiling of 25.00 lakh. In case GST becoming applicable during the tenure of this Policy, the above said concession shall be extended to State GST only.

For Medium/Large/Mega Large/Ultra Large Enterprises:

1. State Capital Investment Subsidy:

30 % subsidy on cost of Factory Building and Plant and Machinery subject to a ceiling of 100.00 lakh

2. Subsidy on cost incurred on Quality Control Measures:

50 % subsidy on cost of laboratory equipment for the purpose of quality control and ISI Certification subject to a maximum of 20.00 lakh.

3. Subsidy on Pollution Control Measures:

50 % subsidy on the cost of pollution control measures subject to a maximum of 25.00 lakh.

4. Subsidy on D.G. Set:

Subsidy @ 30 % on the cost D.G. Set purchased for captive use of energy subject to a ceiling of 50.00 lakh.

5. Reimbursement of Stamp Duty & Registration fees:

Subsidy @ 75 % subject to a maximum limit of 5.00 lakh of the applicable stamp duty to assist execution of deeds of conveyance/mortgage pertaining to loans from Financial Institutions and Banks for projects located within the State of Meghalaya.

6. Refund of Central Sales Tax (CST) :

Subsidy @ 100 % on the amount of CST actually paid on purchases of such machinery and equipments which are genuinely required as is installed upto the date of commissioning of the unit subject to a ceiling of 100.00 lakh. In case GST becoming applicable during the tenure of this Policy, the above said concession shall be extended to State GST only.

7. Sales Tax/VAT Remission:

The State Government shall provide 99 % Sales Tax (MVAT) remission to eligible industrial units on sale of goods/by products within the State for a period of 7 (seven) years from the date of commencement of commercial production.

Accordingly, the unit shall pay 1 % of the tax amount payable in accordance with tax return under MVAT to the State Government. Similarly for sale of goods/by products between interstate the unit shall be eligible for remission of 99 % of the CST amount as applicable and shall pay only 1 % of the tax amount under CST to the State Government for sale of finished goods/by products to any registered dealer/customer and submit “C” form wherever applicable. All new & existing units undergoing expansion of 25 % or more shall be eligible for exemption for the further period of 5 years.

In case GST becoming applicable during the tenure of this Policy, the above said concession shall be extended to State GST only.

8. Special incentives for Export Oriented Units:

Additional subsidy @ 15% on cost of Factory Building and Plant & Machinery subject to a maximum of 50 lakh for Export Oriented Units exporting minimum 25% of its installed capacity for at least 3 consecutive years.

9. Special Incentives for Food Processing Industries:

All Food Processing Industries including local Breweries/Distilleries will be eligible for all incentives at all sources of taxation on its own brand/products.

10. Interest Subsidy:

Subsidy @ 4 % on interest paid to Banks/Financial Institutions subject to a ceiling of 30000.00 per month on term loans (excluding working capital loans) availed by an entrepreneur for setting up of enterprises for a period of 3 (three) years from the date of disbursement of the loan.

11. Special incentives for Mega Large Enterprises:

An approved Project in the Border Area will be granted exemption from paying royalty on those minerals which are used on manufacturing activity for 6 months.

12. Special incentives for Ultra Large Enterprises:

An approved Project in the Border Area will be granted exemption from paying royalty on those minerals which are used on manufacturing activity for 1 year.

13. Border Area Subsidy:

Additional subsidy @ 15 % on cost of Factory Building and Plant & Machinery for all categories of Enterprises set up in Border Areas within 10 Kms from the international border subject to a ceiling of 50.00 lakh.

WASTE TO WEALTH

Waste to Wealth

Pineapple as a fruit generates large quantum of waste post processing which includes crown, core, peels and pomace. The disposal of such organic wastes is one of the major concerns for the industry and country like India as well. It involves high amount of capital investment including huge transportation costs to carry and dispose it off over dumping grounds. Sometimes industries rather opt for burning them to minimise cost of transportation. This however contributes to severe environmental pollution.

Various value-added products which can be derived from the wastes are:[18]

Production of biofuels from fruit waste streams:

Biomass including pineapple waste contributes to the enormous renewable energy sources for the production of biofuels such as biogas, bioethanol, and briquettes. The use of renewable energy is among the few proven, cost-effective and available technology to combat greenhouse gas emissions and their associated effects.

Production of juice:

Conventionally, pineapple juice is produced from a ripe and fresh pineapple. Drying is the major pineapple processing activity for farmers in pineapple growing areas in Uganda. However, not all harvested pineapple is used for drying purposes. Defective pineapples are usually culled contributing to waste at the processing facility. Just like the good and selected pineapples, culled pineapple equally exhibits high moisture content, high sugar, vitamin C, and low fibres.

The process for juice extraction from culled pineapple involves removal of crown, cleaning/washing in clean water, peeling, size reduction by cutting, juice extraction, juice filtration, pasteurization and storage. Also, pineapple peelings generated during the preparation of pineapple slices for drying can effectively be used for juice production. Pineapple peelings have a moisture content of about 85%. Pineapple peels are cleaned, crushed to extract the juice, filtered to separate the solid part from the juice. The juice is then subjected to the rest of the processes including pasteurization and storage.

Pineapple wine:

Pineapple wine can be processed from culled pineapple, pineapple peelings, and the core. The moderately high sugar content in the pineapple waste and culled pineapple assists in the fermentation process to produce wine.

Production of animal feeds:

Several studies have reported the potential for use of pineapple waste for animal feed. Flesh pineapple waste is highly susceptible to deterioration given the high moisture content. Conversion of pineapple waste into shelf-stable animal feed helps improve the situation.

Another animal feed worth developing is the feed block. The feed block is composed of forage, concentrate, and other supplementary nutrients in desired proportions capable to fulfil the nutrient requirement for the animal. Compressed pineapple waste (peels, crown, and pomace) with paddy straws at a moisture content of 8.7% (wet basis) into an animal feed block with molasses as a binding agent.

[18] https://www.sciencedirect.com/science/article/pii/S2667010020300123

Therefore, the use of pineapple waste is an attractive alternative to the conventional green fodder for livestock.

It was seen that in Assam some of the farmers actually utilized damaged pineapple as feed for animals as Assam is well known for piggery and cattle rearing.

----------END OF MAIN REPORT (Annexures Follow) ----------

ANNEXURES

Annexures

Annexure 1: Product Profile – Pineapple

Pineapple scientifically known as "Ananas Comosus" is derived from the word "Nanas" meaning excellent fruit. It is rich in vitamin A, B & C and contains a special enzyme called 'Bromelin' which helps with digestion. Each 100 gram of edible pineapple contributes to 50K calories, 0.54 gm protein, 58% vitamin C, 44% manganese, 86% water and 13% carbohydrate. It is packed with a variety of disease fighting antioxidants which reduce the risk of chronic disease like heart disease, diabetes and cancer; the anti-inflammatory properties also boost the immune system.

Varieties & Characteristics

The conducive climatic conditions in the NER region and parts of West Bengal, do support cultivation some of the best quality pineapples.

The major varieties that are grown in the region include:

Kew Variety

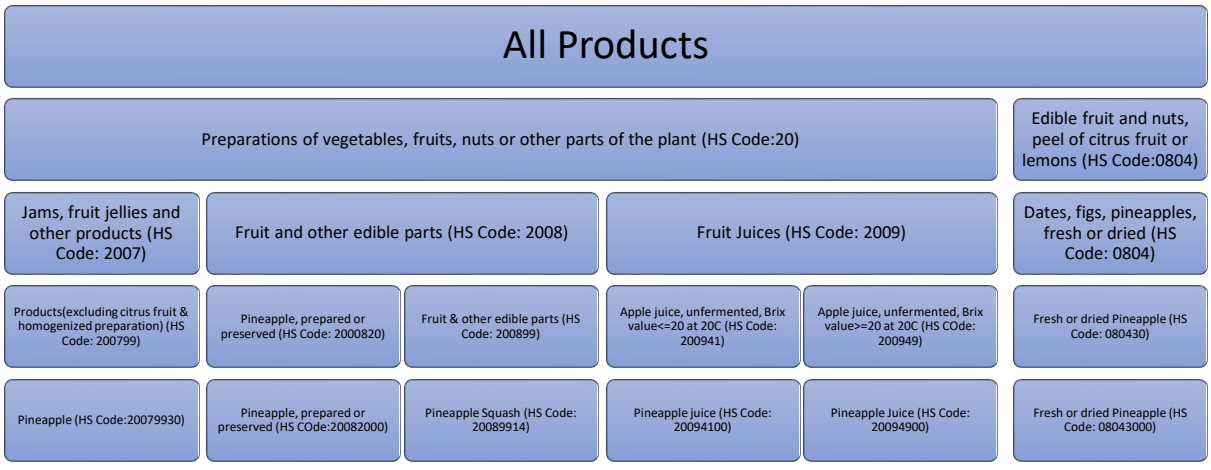
1) Weighing between 1.5 – 2.5 kg
2) Light yellow in colour, juicy and fibreless
3) Aroma and flavour
4) Suitable for canning and processing

Queen Variety

1) Weighing between 1-1.5 kg
2) Comparatively high shelf life
3) Suitable to be consumed as table variety

Apart from the above-mentioned varieties Giant Kew and Mauritius are some other varieties which are found in the region.

Owing to the population India has, maximum of the produced pineapple are consumed locally and rest of the produce find their market majorly in middle-east and western countries. Apart from the juice, the flesh of the pineapple also serves as animal feed and used in other cuisines. The different products that are obtained post processing from pineapple include but are not limited to jam, jelly, squash, vinegar, alcohol etc.



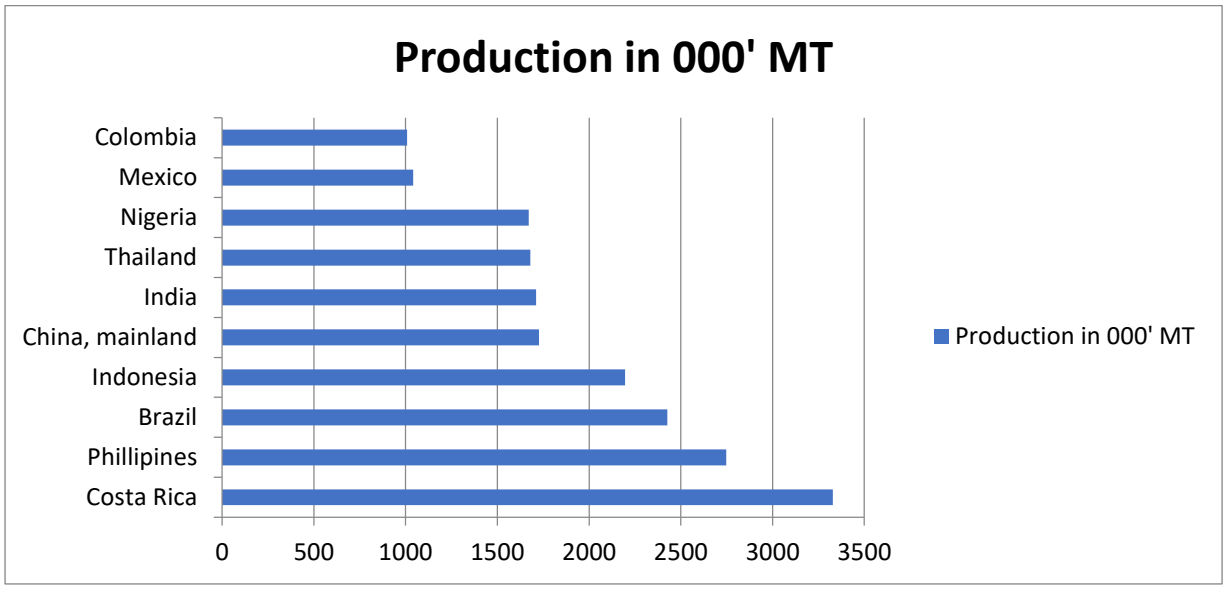
A fully ripe pineapple is considered highly perishable, hence cannot be kept for more than 3-4 days after harvesting. The different varieties of pineapple which are available in India are Kew, Giant Kew, Queen, Mauritius, Jaldhup, Lakhat, Amruta and MD-2. Owing to the different varieties Indian witnesses varied seasonal harvesting but majority of the harvesting occurs from July till September. Humid tropical climate is more conducive for the cultivation of pineapple. The optimal temperature ranges from 15-30 degree Celsius.

The total area under India and World is 1.1 lakh hectare and 10.98 lakh hectares respectively. According to a study by FAO, India is the 6th largest producer of pineapple in the world with a production of about 7% of the total world share. The major pineapple producing states in India include Assam, West Bengal, Manipur, Mizoram, Tripura, Nagaland, Meghalaya, Bihar, Tamil Nadu, Karnataka, Kerala and Andhra Pradesh. Some other major countries apart from India which have a major contribution towards commercial production of pineapple are Costa Rica, Philippines, Brazil, Thailand, Indonesia, Nigeria, China, Colombia, Mexico etc.

Annexure 2: Global production, consumption; Indian Trade of Fresh and Processed Pineapple

Global Production of Pineapple

Below graph depicts the top ten pineapple producing countries worldwide.



According to the above data Costa Rica, Philippines and Brazil are among the top three pineapple producing countries worldwide. Costa Rica has produced close to 3.33 million metric tons of pineapple in 2019. Worldwide production of pineapple was close to 28 million metric tons.

Global Consumption of Pineapple

Brazil, the Philippines, Indonesia, India and China held 40% of pineapple consumption.

The countries with the highest consumption were Brazil (11% of the world total), the Philippines, Indonesia (8%, each), India (7%), China (6%), Nigeria, Thailand (5%, each), Costa Rica, the U.S. (4%,

each), Angola, Mexico, Colombia, Ghana (3%, each), Viet Nam, the Dominican Republic (2%, each). The remaining countries made up 24% of global pineapple market.[19]

Now considering Asia, the highest quantum of consumption in 2018 were recorded by Philippines (2.3M tones), Thailand (2.1M tones) and Indonesia (1.8M tones)which constituted of 53% share of consumption. They were followed by other countries like India, China, Vietnam and Taiwan.

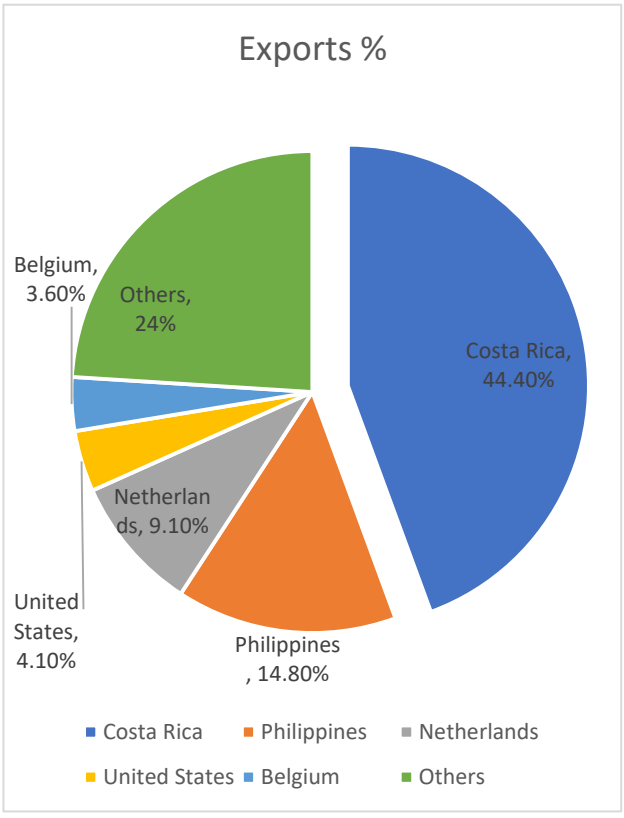
Global Trade of Pineapple

International trade witnesses export of pineapple in four major different forms such as fresh fruit, canned, concentrated juice and plain juice. Costa Rica has the market monopoly in terms of fresh fruit exports followed by Philippines.

Global Exports

According to data available, global sales of traded pineapples exported worldwide from different countries stood at $2.2 billion in 2019. There was an average rise of 29.7% as compared to year 2015 which was then valued at $1.7 billion. According to recent data available, the export of pineapple has increased by about 5.2% from the year 2018 to 2019.

Global sales for pineapples exports by country totaled US$2.1 billion in 2020. Overall, the value of exported pineapples increased by an average 8.2% for all exporting countries since 2016 when pineapples shipments were valued at $1.9 billion. Year over year, the value of globally exported pineapples fell by -5.5% from 2019 to 2020.



The top 5 exporters (Costa Rica, Philippines, Netherlands, United States, Belgium) generated just over three-quarters (76%) of all globally exported pineapples in 2020. Among continents, Latin America excluding Mexico but including the Caribbean generated the highest dollar worth in international sales of pineapples during 2020 with shipments valued at $1.1 billion or over half (53.2%) of the worldwide total. In second place were Asian exporters at 18.8% while 18.5% of total shipments of the sweet fruit originated from Europe. Smaller percentages came from North America (5.3%), Africa (4.3%) then Oceania (0.007%) notably New Zealand and Australia.[20]

The top 10 countries which exported highest value in terms of US$ are:

1. Costa Rica: $922.7 million (44.4% of total exported pineapples)
2. Philippines: $307.7 million

[19] Key insights into global pineapple market (bizcommunity.com)
[20] Pineapples Exports by Country 2020 (worldstopexports.com)

3. Netherlands: $189.8 million
4. United States: $84.5 million
5. Belgium: $75 million
6. Ecuador: $59 million
7. Taiwan: $55.8 million
8. Honduras: $49.7 million
9. Guatemala: $40.4 million

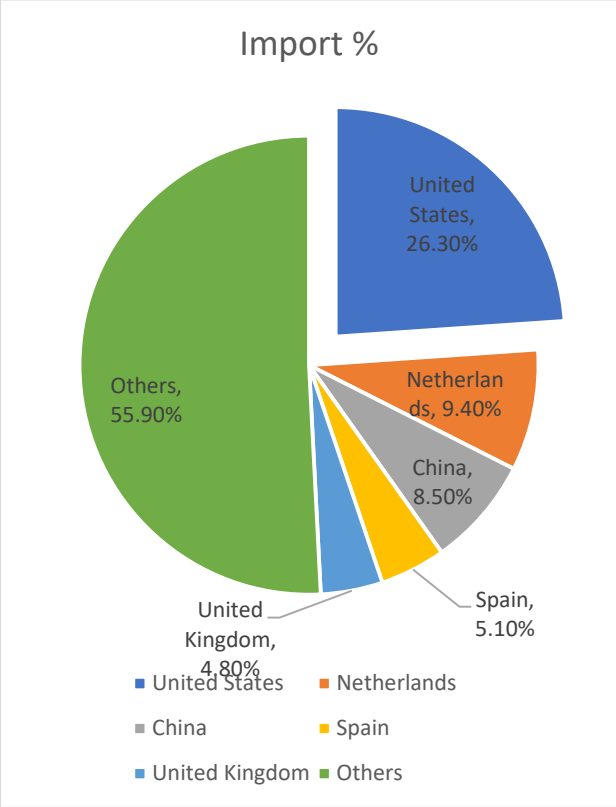
Ghana: $31 million

Global Imports

In 2019 the worldwide purchases of pineapple stood at a total value of about $2.72 billion. Overall value of pineapple imports increased by over 13% since 2015, when international purchases were valued at $2.4 billion.

Pineapple is imported by over 168 countries, islands/territories around the world. Out of those four major countries contribute to 54.2% of the total purchase in 2019 which are United States, Netherlands, Spain and United Kingdom.

Trends show that buyers from the European countries have bought the highest dollar worth of imported pineapple during 2019 which amounted to $1.3 billion which was again 48.6% of global trade. They were followed by North America and Asia at 29.9% and 19.5% respectively.



The top ten countries which imported highest value in terms of US$ are:

1. United States: $714.4 million (26.3% of total imported pineapples)
2. Netherlands: $256.5 million
3. China: $232.1 million
4. Spain: $138.5 million
5. United Kingdom: $131.5 million
6. Germany: $128.7 million
7. France: $127.3 million

8. Belgium: $126.7 million
9. Japan: $125.9 million
10. Italy: $119.9 million

According to the above table, West Bengal is one of the highest contributors towards pineapple production in India.

Seasonality:

States	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
West Bengal				L	L	L	P	P	L	L	L	L
Assam							L	P	L	L	L	L
Manipur					L	L	L	P	L	L	L	L
Tripura						L	P	P	L	L	L	L
Bihar	P	P	L									L
Karnataka								L	P	P	L	L
Meghalaya						L	P	P	L	L		

Indian Trade of Pineapple

Fresh Pineapple

Though India is among the top pineapple producing state globally, the export of fresh pineapple is still low as compared to the quantum of production of the commodity. Major importer of Indian Pineapple are mostly Asian markets such as Nepal, Qatar, Saudi Arabia, UAE and Maldives.

Preserved Pineapple

India ranks 56th on the global export ranking. The table below shows exports from different states in India.

State	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US $	Qty (MT)	US $	Qty (MT)	US $	Qty (MT)	US $
Kerala	23.9	18360	100	154448	105.5	136517	106.6	124922
Maharashtra	0.01	47	2.59	10759	4.95	18729	5.67	25090
Delhi	0	0	0	2	0.05	44	6.11	9719
West Bengal	0	0	0.06	216	70.55	31125	17.14	6364
Bihar	2.1	3349	15.7	40207	5.95	7980	1.64	3245
Telangana	0.2	353	0	0	0	0	0.15	411
Tamil Nadu	0	3	0	0	0.09	389	0.05	265
Uttar Pradesh	5	10770	0	0	0.22	700	0	0
Andhra Pradesh	0	0	0	0	0	0	0	0
Gujarat	1	5920	0.35	703	2.6	13892	0	0
Karnataka	53	56644	0.05	971	0.03	655	0	0
Punjab	0	0	0.04	65	0	0	0	0
Rajasthan	0	0	0.01	18	0	0	0	0

According to the above table Kerala is one of the highest exporters both in terms of Quantity and in terms of Value followed by West Bengal.

The below table illustrates the import of preserved pineapple by India from different countries across the globe.

Country	2015-16		2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	Thousand US$	Qty (MT)	Thousand US$	Qty (MT)	Thousand US$	Qty (MT)	Thousand US$	Qty (MT)	Thousand US$
Philippines	976.8	1067.33	919.7	1096.6	958.2	1059.61	896.06	910.48	1079	1128.41
Thailand	408.5	484.81	171.1	229.4	315.8	355.82	1037.1	878.61	704.9	738.9
Indonesia	0	0	0	0	0.5	0.72	230.56	242.32	52.38	54.99
Vietnam	0	0	0	0	37.11	29.96	37.09	27.86	24.46	19.66
UAE	0	0	0	0	0	0	0.6	1.83	4	4.22
Belgium	0.06	0.25	0.29	1.17	0	0	0.56	2.24	0.54	2.09
Oman	0	0	0	0	0	0	0	0	0.6	1.68
Netherland	0	0	0	0	0	0	0.28	0.37	0	0
Poland	0	0	0.1	0.37	0.45	2.03	0.29	1.21	0	0
Spain	0	0	0	0	0.3	0.41	0	0	0	0
Taiwan	0	0	0	0	0	0	0.14	0.23	0	0
UK	0	0	0.15	0.24	0	0	0	0	0	0

The major amount of preserved pineapple is imported by India from Philippines. According to the above data, Philippines has exported pineapple worth 1128.41 thousand USD to India. It is followed by Thailand which is the second largest exporter of preserved pineapple to India amounting to 738 thousand USD.

Jams, Jellies, Marmalades etc. of Pineapple

Apart from consumption of pineapple as preserved and fresh fruit pineapple is also consumed in other forms such as jams, jellies etc. These products help in increasing the shelf life as compared to raw pineapple. It is also seen that processed form of packing also helps in process of transportation.

India exports pineapple jams, jellies and marmalades to other countries. The below table shows the quantity as well as the value of products exported from each state.

State	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$
Kerala	77.01	90322	84.29	107161	51.35	89552	34.6	72981
MP	153.8	148176	105.8	124670	124.2	147854	40.3	63136
Tamil Nadu	0.72	1032	25.07	33918	63.77	78530	43	54838
Maharashtra	16.19	14832	30.23	36527	14.8	18204	12.2	18813
Gujarat	3.6	6854	10.7	14914	12.46	24219	12.7	13600
UP	0	0	0.6	1003	6.03	7914	6.4	12441
West Bengal	0.07	120	0	0	0.43	569	13.5	8062
Bihar	3.2	3658	1.88	1988	0.78	1386	5.1	7704
Karnataka	0	0	11.13	30470	0	0	3	6628
Punjab	0	0	5.09	4033	3.65	3857	1.78	2159
Delhi	10.61	10155	5.48	6239	0.53	742	0.7	972

According to the above table Tamil Nadu is the state which leads in export of pineapple jams and jellies etc. followed by Madhya Pradesh and Kerala. According to the data Tamil Nadu exported 43 MT of pineapple in 2019-20.

Considering imports, India imports a small volume of these above-mentioned product. The below table shows some of the prominent country wise imports by India.

Country	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)
Belgium	4.21	11.3	2.38	8.67	0	0	33.96	73.29
Bhutan	0	0	14.05	12.01	2.77	3.48	29.35	36.91
Thailand	3.17	7	1.69	4.18	3.98	9.42	2.68	5.81
Netherland	0.03	0.1	0.59	1.75	1.84	5.49	1.81	5.02
USA	0	0	0	0	0	0	0.41	3.31
Spain	0	0	0	0	0.57	4.46	0.81	2.52

According to the data, Belgium is the largest importer of pineapple jams, jellies and marmalades from India followed by Bhutan. In the year 2019-20 Belgium has imported amounting to 73 thousand USD.

Pineapple Juice (brix value ≤20)

The table below provides data regarding export of pineapple juice having brix value less than equal to 20 from various states.

States	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$
Maharashtra	0	0	0	0	0.1	175	21.6	15630
Delhi	0	0	0	0	0	3	0.02	45
Kerala	44.76	38456	121.83	90346	117.6	76428	0	0
Tamil Nadu	207	294820	0	0	0.07	68	0	0

In terms of import of pineapple juice having brix value less than or equal to 20, below table shows the quantity in MT and value in Thousand USD that is being imported from other countries by India.

Country	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)
Philippines	111.62	125.76	13.95	15.52	139.52	151.36	55.81	57.31
Malaysia	19.36	15.15	27.42	16.79	29.74	16.4	20.68	11.05
Bhutan	0	0	0	0	0	0	0.04	0.03
Belgium	0	0	0	0	0	0.06	0	0
Saudi Arabia	0	0	0	0	13.68	8.15	0	0
Thailand	3.2	4.17	35.13	29.63	19.46	20.32	0	0
UAE	21.96	25.11	0	0	0	0	0	0
USA	0	0	0.08	0.19	0	0	0	0

Pineapple Juice (brix value>20)

Pineapple juice which has brix value greater than 20, has got better demand in terms of exports to other countries. The below table illustrates the quantity of exports along with value in USD from different states.

States	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	USD ($)	Qty (MT)	USD ($)	Qty (MT)	USD ($)	Qty (MT)	USD ($)
Tamil Nadu	604.6	1020859	302.16	381685	172.04	195875	255.84	415464
Maharashtra	121.7	204063	316.49	466487	119.19	164587	101.96	161697
Karnataka	0	2	0.18	176	74.55	104419	32.4	41955
Bihar	14.76	3581	0	0	0.01	22	3	5693
Kerala	1.47	1709	0.25	368	0	0	0.5	4643
Sikkim	0	0	0	0	0	0	1.06	1928
Delhi	0	3	0	0	0.1	242	0	0
Gujarat	0	0	26.71	27569	0	0	0	0
Haryana	0	0	0.15	429	0.12	548	0	0

Now according to the above-mentioned data Tamil Nadu is one of the major contributors for pineapple juice exceeding brix value of 20. In the year 2019-20 it was able to export about 255 MT of pineapple juice to other countries.

Now in terms of import of pineapple juice which has value of greater than 20 brix below Manson have some of the countries which import pineapple juice from India.

Country	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)	Qty (MT)	US$ (000)
Thailand	759.4	2220.4	717.2	1261.7	373.1	444.2	508	708.7
Philippines	17.2	31.5	34.4	48.8	103	137.4	102.9	131.9
Indonesia	42.9	123	169	231.3	128.8	139.9	42.9	54.5
Israel	0	0	0.3	2.0	1.3	5.5	8.8	15.4
Bhutan	0	0	8.5	10.2	1.8	2.0	14.2	12.4
UAE	4.0	3.1	0.7	1.7	0	0	1.0	3.5
South Africa	1.8	1.5	0	0	7.1	5.8	2.7	2.3
Bangladesh	0	0	0	0	0	0	1.1	1.4

As inferred from the above data Thailand is one of the largest importers of pineapple juice (brix>20) from India, followed by Philippines and Indonesia. Bhutan and Bangladesh being neighbouring countries are slowly picking up the pace.

Pineapple Squash

Considering pineapple squash, majority is consumed domestically however some quantity is also exported to consumers outside India. The below table illustrates the quantity and value of pineapple exported from different states.

State	2016-17		2017-18		2018-19		2019-20	
	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$	Qty (MT)	US$
Karnataka	0	0	0	1	35.3	56879	9.7	42978
West Bengal	0.1	295	0	0	0	0	8.4	31318
Maharashtra	0	0	1.4	5228	4.5	10101	3.4	11848
Bihar	0	0	4.0	3833	2.2	1920	10.9	11072
Gujarat	18.9	26107	21.6	34555	0	39	1.2	4774
Kerala	0.3	327	1.0	4525	0.5	1262	0.3	714
Tamil Nadu	0	0	2.4	2216	1	137	0.1	375
UP	0	0	0.5	923	0	16	0.1	117

Delhi	0	39	0	44	0	0	0	34
Uttarakhand	0	0	0	0	0.1	54	0.1	25

Considering imports by different countries Bhutan is the only country which is currently importing pineapple squash from India. In 2019-20 the import by Bhutan amounted to 26.9 thousand USD.

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