

# A Study on Feasibility of Cold Storage and Food Processing Units for Pineapple in Assam

Vivek Kr. Pathak<sup>1</sup>, Hirak Chakraborty<sup>2</sup> and K.M Pandey<sup>3</sup>

<sup>1</sup>Department of Humanities & Social Sciences NIT Silchar

<sup>2</sup>Department of management Studies NIT Silchar

<sup>3</sup>Department of Mechanical Engineering NIT Silchar

E-mail: <sup>1</sup>[iampathak.v@gmail.com](mailto:iampathak.v@gmail.com), <sup>2</sup>[hirak\\_raj@rediffmail.com](mailto:hirak_raj@rediffmail.com), <sup>3</sup>[kmpandey2001@yahoo.com](mailto:kmpandey2001@yahoo.com)

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**Abstract**—North-Eastern region of India is endowed with varieties of fruits, vegetables and other agro-products and has the potential to be a sunrise zone for food processing and other agri-product based businesses. This paper deals with immense opportunities present in food processing in the region. It is observed that simple value addition like cleaning, sorting and packaging can increase the quality and durability of the produce as well as it helps in improving the economic condition of the farmers also in return. It is also observed in the study that this sector is not delivering the desired output because it is still highly unorganized, inefficient, and unprofitable in spite of having various policies and schemes for the development of this sector by various governmental agencies. It is also established in the study that the development of food processing sector in North East Region of India is mired due to poor infrastructure, poor connectivity with potential markets, inadequate and inefficient supply chain, insufficient power supply and pitiable irrigation facilities. Many growers and farmers are shifting from pineapple to rubber plantation due to acute lack of cold storages and food processing units in the region. A purposive sampling has been used for selecting the farmers/owners of the pineapple plantation. The study also targets the sellers and the consumers of Pineapple. Questionnaire was prepared for collecting the primary data and various reports from the government agencies were used for secondary data for analysis in the study.

## 1. INTRODUCTION

India is a richly endowed agricultural nation. India has all major climates of the world, enjoys long sunshine hours, fairly good rainfall which are ideally suited for round the year cultivation. It has the largest cattle population, second largest goat and sheep population and a vast coastline. Given the resource endowment, India has all the potential to become one of the largest food processing nations in the world. Potential for production is also matched by strong demand for processed food products due to rapid urbanization, change in preferences and practices in consumption.

Horticulture crops form a significant part of the total agriculture produce in the country comprising of fruits, vegetables, root and tuber crops, flowers, medicinal and aromatic plants, spices and condiments etc.

Horticultural development in the country continues to make steady progress in terms of production and exports. Past years have seen a significant increase in the area, productions and productivity in horticultural crops in the country.

In an emerging country like India, where growth with equity is a primary policy thrust, the optimum development of the food processing sector will contribute significantly in tackling several developmental concerns such as disguised unemployment in agriculture, rural poverty, food security, food inflation, improved nutrition, prevention of wastage of food, etc. By serving as a bridge between agriculture and manufacturing and by dealing with a basic need of all Indian citizens the assured supply of healthy and affordable food at all locations in the country, this sector has the potential to be a major driver in India's growth in coming years.

India's appalling state of food wastage is docketed to the insufficient cold chain facilities in the nation. India is among the top producers of fruits & vegetables and also faces the highest amount of wastage in the category. Inappropriate food/cold storage facilities not only affect the quality and freshness of the food but also severely affect the food prices in the nation.

All the eight North Eastern states produce pineapple. The advantageous position of North Eastern Region in terms of fertile and organically rich soils, abundant rainfall, water resources and great agro-climatic diversity supports the cultivation of best quality pineapple in the region. The region produces more than 40% of pineapple produced in the country and almost 90%-95% of the produce is organic. Pineapple produced in the region is qualitatively different and is said to be among the best in the world as they are sweet with less fibre.

Pineapple is a perennial crop with an economic life of 5-7 years, however, in the North Eastern region; the farmers cultivate it beyond 12-15 years through crop manipulation and traditional agronomic practices. In many parts of North Tripura and in the Barak Valley of Assam, even 20-25 year

old plantations can be seen. In the region, Assam, Tripura, Meghalaya and Nagaland are major pineapple producing states.

There are two popular varieties of pineapple cultivated in North East popularly known as:

- a. Kew (also known as Smooth Cayenne) – Suitable for canning with an average fruit weight of 2-3 kg.
- b. Queen – Table fruit variety with an average fruit weight of 1-2 kg.

Assam is the largest producer of fruits and vegetables in the northeast region and contributes 60% to the total horticulture production of the region. It acts as a gateway for marketing of horticulture produce from northeast to rest of the country.

Horticultural crops in the state occupy nearly 15% of the gross cultivated area and the state produces more than 15.0 lakh MT of fruits, 29.0 lakh MT of vegetables and 1.0 lakh MT of spices besides nut crops, flowers and medicinal & aromatic plants annually. In spite of having such inherent potential, commercialization of horticulture sector in Assam has not yet happened. From the productivity point of view, productivity of fruits in the state is more (13.50 MT/ha) as compared to national level (11.73 MT/ha) and NE Region (8.57 MT/ha). Productivity of vegetables in the state is found to be less (11.25 MT/ha) in comparison to national level (17.25 MT/ha) but more than NE Region (10.13 MT/ha). This situation leads to the opportunity of productivity enhancement.

In Assam, pineapple is cultivated in all districts, while the identified clusters for pineapple cultivation are Cachar, Kamrup, Sonitpur, Karbi Anglong and Dima Hasao. Kew, Giant Kew and Queen are the major varieties grown in the state.

## 2. PROBLEM STATEMENT

The North East Region of India alone produces more than 40% of the total pineapple of the country and 90 to 95% of the produce is organic. Pineapples produced from this region are qualitatively different and are said to be among the best in the world. The state of Assam ranks second among all the states of India in terms of pineapple production. Despite having good production figures the region underperforms in terms of productivity and marketing the product. During the peak season, the markets are covered with big heaps of pineapple, which leads to a glut in the market. Of the total production, barely any of the fruit is processed, the rest being consumed in the fresh form, which leads to a very low price. There is no regular market in most of the production zones and a large quantity of pineapple gets wasted in the field itself. No value addition is being undertaken by the farmers at the field level. The fruit being perishable has a short shelf life. The absence of any kind of cold chain adds to the post-harvest wastages. Before going for any recommendation for setting up of cold

storage facility and/or food processing units, this feasibility study becomes very crucial.

### 2.1 Objective of the Study

1. To recognize the pineapple production in the study area and find out the prospects of further growth prospects..
2. To study and analyze the feasibility of cold storages and processing units for pineapple in the region.

## 3. RESEARCH METHODOLOGY

### Data Source

*Primary Data:* Primary data source are the pineapple cultivators, sellers and the intermediaries.

*Secondary Data:* For secondary data, sources such as vision documents of North Eastern Region, Government of India publications, Reports of National Horticulture Board, Indian Institute of Horticulture Research, Ministry of Food Processing Industries, etc. were used.

### Data Collection Methods

For Primary data collection a schedule was prepared and information from designated officials, cultivators, sellers and intermediaries was collected through personal interactions.

The secondary data were available in a readymade format over the internet and in the offices. Exhaustive desk research was undertaken based on published information such as state profiles, research reports, publications of government officials and other sources.

### Sampling Technique:

*Sample Size-* 18 farmers were selected who were the owner of the plantations. They also employed other farmers under them who were basically not the owner of any plantation or owned a small plantation.

*Sampling Type-* Purposive Sampling.

*Target-* Pineapple Growers/farmers, sellers and consumer.

### Limitations of the Study

Due to constraints of time and resources the study is likely to suffer from certain limitations. Some of them are

- a. The information given by the respondents might be biased because some of them might not be interested in providing correct information.
- b. The officials supported a lot but did not have sufficient time to clear all the points.
- c. Since majority of the farmers are shifting from pineapple production to rubber plantation so the collection of the pineapple production data faced hurdles regarding the land engaged by the farmers in pineapple production.
- d. Various data were given just verbally by the officials.
- e. Some of the data available may not be updated.

#### 4. LITERATURE REVIEW

In the paper, Food Processing Industry: Opportunities in North East Region of India, Mohammad Rais, Shatroopa Acharya and Gary W. Vanloon has observed that The food processing industry has made some significant progress in the North Eastern Region. Through arrival of MNC's and locals realizing the potential, the sector is all set to boom. Yet, the sector continues to face many challenges. Originating within a difficult geo-physical terrain, varied socio-economic conditions, poor road connectivity and environment problems, the sector is cluttered with complications. The geo-physical terrain of the region with widely scattered diverse tribal communities is itself a huge challenge in formation of a cohesive socio-economic policy for the region. Hence, there is a need of special approaches to deal such issues <sup>[1]</sup>.

In a research report, titled Export Potential of Horticultural Products from North Eastern States published by APEDA, it is mentioned that in the year 2004-2005 there was a surplus production of 1,84,319 metric tonnes of pineapple <sup>[2]</sup>.

**Table 1: Surplus Quantities Of Major Horticulture Products In North Eastern States.**

Commodity	Citrus	Banana	Pineapple	Papaya	Jackfruit	Ginger	Turmeric	Potato	Chillies
Arunachal Pradesh	18702	10168	24919	-	-	25163	-	-	-
Assam	12000	85000	29000	15000	25000	42000	-	-	-
Manipur	1962	-	24000	5320	-	7045	-	-	22200
Meghalaya	23000	-	70000	-	-	35048	6900	117500	-
Mizoram	5300	1200	-	-	-	16500	400	-	424
Nagaland	2000	-	5400	-	-	-	-	1750	-
Sikkim	1100	-	-	-	-	24300	1300	32612	-
Tripura	10500	-	31000	-	93000	960	1600	-	11650
<b>Total</b>	<b>74564</b>	<b>96368</b>	<b>184319</b>	<b>20320</b>	<b>118000</b>	<b>151016</b>	<b>10200</b>	<b>151862</b>	<b>34274</b>

In the paper, Financial Viability, Value Addition and Constraint Analyses of Certified Organic Pineapple Production and Marketing in Ghana, John K.M. Kuwornu, Abdulai A. Nafeo and Yaw B. Osei-Asare have assessed the value added by the farmer, retailer and processor. It established that the processor adds the highest value per metric tonne of pineapple fruits followed by fresh fruit retailer and then the farmer. On the average the pineapple drying processor adds the highest total value per tonne of fresh pineapple followed by the slicing processor and then juicing processor. On the whole, the drying processor incurs the highest cost per tonne and hence sells at a higher price to obtain a value to recover cost and make some profit to remain in business compared to the slicing and then juicing processor. On a daily basis, the drying processor adds the highest value

followed by the slicing processor, the juicing processor, the retailer and then the farmer <sup>[3]</sup>.

From the Economic Survey of Assam conducted in the year 2012-2013, it can be inferred that as per the data available from Agriculture Department, Assam has brought tremendous change in the production of fruits, spices and vegetables and thereby opening ample scope for setting up of food processing industries in the state.

At present less than 30% of the food products are processed in the state, of which 80% of the processing industry is concentrated upon rice, tea, milk, flour, spices, etc. Processing and packaging of perishable fruits and vegetables does not have desired importance due to non-availability of sufficient storage units <sup>[4]</sup>.

In a report published by ONICRA on Food Processing Industry in India, the agency identified Food Processing Industry (FPI) in India as a sunrise sector that has gained prominence in the recent years. Easy availability of raw materials, changing lifestyles and favourable fiscal policies has given a considerable push to the industry's growth <sup>[5]</sup>.

The Department of Horticulture, Government of Assam, had published "Horti Vision 2020" in which the department has identified Assam as a 'Sleeping Giant' for the wide range of horticultural crops. Identifying the scope of growth in the sector, it had listed a number of steps for increase in production and quality <sup>[6]</sup>.

In the report titled India's North-East - Diversifying Growth Opportunities, the Indian Chamber of Commerce has identified that to be socially, and economically sustainable, India's growth story needs to be inclusive. However, the country's north east has been experiencing a comparatively slower pace of industrialisation and socio-economic growth. Though the region is blessed with abundant natural resources for industrial development and social development, they have not been utilised to their full potential <sup>[7]</sup>.

#### 5. FINDINGS

##### 5.1 Interaction with the farmers of Hmarkhawlien, Cachar, Assam

The interaction took place at the Pineapple Farmers Community, a community formed by the pineapple growers of the region. There were a total of 18 farmers with whom the interaction took place. Following points were highlighted during the interaction:-

- Most of the plantations were around 20-25 years old.
- New plants were planted only if a plants dies or in case of expansion.
- Every year a huge quantity of the produce is wasted in peak season because of the lack of storage facilities.
- The farmers want advice on how to 'sell' more instead of how to 'grow' more.

- e. Most the farmers avoided the trainings camps as there was nothing new in that and whatever improvisation was discussed off, according to the farmers, it could not be implemented practically.
- f. The financial benefits were not availed by most of them as they did not know of the benefits and those who knew they just avoided it as there is a lot of paper work involved in getting the benefits.
- g. Although some of the farmers sell the product by maintaining their own logistics, most of the farmers sell the product to the agents who contact them from time to time as the demand arises.
- h. The agents bring their own transportation medium to ferry the pineapples.
- i. Although the agents do not disclose the location where the pineapples are sent but the farmers wild guesses are Silchar, Aizawl, Hojai and Shillong.
- j. The rates are fixed by the community and the rate for last year was Rs. 8 for the smaller fruit and Rs.12 for the larger ones.

## 5.2 Interactions with the Officials of Government Agencies.

### 5.2.1 North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC)

Following points were discussed in the interactions with the General Manager (Marketing) and the Marketing Manager of NERAMAC:

- a. Logistics is the major problem in the region and cost expensive too.
- b. Infrastructure development is still at a nascent stage. So there is a need to "Make North-East" before "Make-in-North-East" can actually happen.
- c. The schemes of central government do not fit-in with the schemes that are required in the North-Eastern India. The North-Eastern region needs a customised plan in accordance to the specific requirement of the region as the region is different from rest of India.
- d. The plantations are very old and hence quality is deteriorating every year which is further reducing the marketability of the product.
- e. There is a huge demand-supply gap.
- f. The availability of packaging materials is an issue in the region. The packaging materials have to be procured from outside the region e.g. Kolkata.
- g. The organization last sold Pineapple to Dabur almost 6 years back.
- h. The Pineapple processing unit set up by NERAMAC is outlived and hence it needs additional funds so that it can be upgraded. It has also requested for commissioning of a new fruit processing plant in Cachar district which is pending with the Central Government. Apart from that nothing is

done to promote the marketing of pineapple and its associated products.

### 5.2.2 Assam Industrial Infrastructure Development Corporation (AIIDC).

Findings from the interactions with the Managing Director, AIIDC are:

- a. He pointed out that there are various schemes both from the Central as well as the State Government for the improvisation of the industrial infrastructure.
- b. A Mega Food Park, commissioned on 2008, is coming up at Tihu. The Mega Food Park would have primary processing centres which will be supplemented by various collection centres.
- c. Apart from that, many processing plants are beginning to come up in the private sector as well in many other parts of the state.
- d. He also highlighted that in case of pineapple processing the department has received no interest so far and there is very negligible amount of processing of pineapple that is happening at present.
- e. Overall, the department is working very well to meet up to the expectations of the people.

### 5.2.3 Agricultural and Processed Food Products Export Development Authority (APEDA).

Following points were discussed in the interaction with the Regional Manager:

- a. APEDA is involved only in exports of agriculture products.
- b. For export there is a definite procedure involved which most of the farmers fail to comply with.
- c. No information on major trade proceedings with Bangladesh.
- d. There is only one reefer truck to cater the entire North Eastern region.

## 5.3 Interactions with Purbanchal Food Products, Silchar, Assam

The following points were highlighted in the conversation with the proprietor:

- a. The pineapples are procured directly from the growers of Lakhipur sub-division. If the growers fail to supply, procurement is directly made from local wholesalers.
- b. Pineapple Juice and Jam are the Pineapple products.
- c. The sales market is mainly in the state of Mizoram, apart from that the products are sold in the local market also but with less quantity.
- d. Previous year, the peak season sale was around 4000 bottles of pineapple juice every day. No requirement of cold storage is felt as the shelf life is 1 year (approx).
- e. Problems faced are mainly infrastructure issues and unavailability of skilled manpower as well as packaging materials.

f. The employees are to be hired from outside the region by paying high salaries.

#### 5.4 Interaction with Shreedhar Apex Biotech, Baghbahar, Assam

M/s. Shreedhar Apex Biotech is the only tissue culture lab in the area. The firm was approached to know the role it can play in developing the pineapple market of the region. During the course of interactions, following points were discussed and highlighted:

- a. The firm approached some of the NGOs for pineapple production by forming a Farmer Producer Organisation but no one was interested in it.
- b. The producers want a guarantee that the product would be purchased by them and accordingly they wanted the monetary benefit even before plantation.
- c. Tissue culture does not affect the taste or size of the fruit. In fact, it enhances the quality of the product.
- d. A minimum productivity of 40,000 kg of fruit per hectare can be guaranteed, yet no one seems to be really interested.

Pineapple is a bulky product with high volume and low unit price. It also has low shelf life even if it is stored in cold storage units. Hence, construction of just cold storages will not support in adding value to it.

#### 6. OBSERVATION

The overall observation of the study are:

- a. The pineapple producers are dissatisfied as because they feel that they are not getting the expected profits.
- b. The education level is low and hence they refrain from the adoption of modern technologies.
- c. The farmers trust the NGOs more than the Government officials but the NGOs are busy in filling their own pockets.
- d. The farmers are shifting from pineapple cultivation to rubber plantation as it is less labour intensive and it generates greater profit margin.
- e. There is absolutely no value addition at the farm-gate level.
- f. The farmers are not interested in any training camps which teach them to increase the productivity as they are unable to sell the produce which they are producing at present. Their demand is to get a way to sell more.
- g. Almost 20% of the produce is exported to Bangladesh 'unofficially'.
- h. Negligible presence of food processing units for value addition for the pineapples produces of the region.
- i. The interaction between the farmers and officials is very low. Also the number employees in the designated government offices are less.
- j. The procedures involved in getting benefits are quite troublesome for them and hence proper utilisation of the various schemes is not happening practically.
- k. The intentions of all the stakeholders of the system are not focused.

- l. Lack of modern logistics infrastructure.
- m. Unavailability of skilled manpower.

#### 7. CONCLUSION

There is a substantial production of pineapple in the North Eastern Region of India. The producers are not interested in increasing their productivity because they are unable to get the appropriate price for their produce. On the other hand, the food processing industry is not growing because of various issues such as infrastructure, logistics, warehousing and cold storage facilities, etc.

The food processing industry presents a very large opportunity to every stakeholder. This is primarily driven by a robust consumer demand, the changing nature of the Indian consumer, who is more informed and willing to try new products; and the strong production base. Also, the several gaps in the current production and delivery systems actually present a huge opportunity for the growth of companies willing to bet long term in this sector.

The region has the potential to become the horticulture hub of the country but then there is a need to co-ordinate the efforts of all the stakeholders who are responsible and can play a vital role in developing the North Eastern Region as a horticultural hotspot. The food processing industry presents a very large opportunity to every stakeholder. This is primarily driven by a robust consumer demand, the changing nature of the Indian consumer, who is more informed and willing to try new products; and the strong production base. Also, the several gaps in the current production and delivery systems actually present a huge opportunity for the growth of companies willing to bet long term in this sector.

The growth of food processing companies has been sub-optimal because of high cost, low level of productivity, high wastage and lack of competitiveness of Indian food products in the global market. Therefore, to fully leverage the growth potential of the sector, current challenges that are being faced by the industry need to be properly addressed and steps need to be taken to remove the bottlenecks hampering the growth.

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