

Problems and Prospects of Fruits and Vegetables Processing Industry: A Study in Kamrup District of Assam



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Abstract

Food processing is the methods and techniques used to transform raw ingredients into food or food into other forms for consumption based on local raw material and indigenous knowledge and skill of the people. One of the important sub-sectors of food processing is fruits and vegetable processing. Though there are enormous potential for the processing activities in Assam yet it is not fully utilized. The sector is encountering a number of problems relating to finance, power, marketing etc. There is an urgent need to provide facilities for development.

In this paper, an empirical study in the Kamrup district of Assam is tried to analyze the prospects and problems of food processing (fruits and vegetables) industry, with certain specific objectives like the study of influencing factors on the growth of fruits and vegetables processing sector and identification of problems with remedial measures.

The study is based on empirical data, both secondary data analysis and case study methodologies are utilized. It revealed that availability of raw materials, infrastructure, government schemes and policies are the prime influencing factors for the establishment of sector and lack of finance, shortage of power, inadequate post harvest technology and facility, poor infrastructure facilities constitute very serious problem.

Proper training should be given in some areas with perfect involvement of entrepreneur and resource persons at adequate place and objectives. Moreover awareness raising activities should be undertaken.

Keywords: Food Processing, Indigenous, Potential, Infrastructure, Schemes and Policies, Influencing factor, Post harvest technology.

Introduction

Food processing is one of the most important micro enterprises for agricultural country, which plays an important role in the economic development. It can be defined as a process of value addition to the agricultural and horticultural product by various methods like grading, storing and packaging etc. In other words, it is a technique of manufacturing and preserving food subsistence in an effective manner with a view to enhance their shelf life, improve quality as well as make them functionally more useful. These industries are based on local natural resources and indigenous knowledge and skill of the people. Apart from directly contributing to income and employment generation, this sector induces output and employment growth indirectly through its linkages with other sectors.

Food processing can be done at home or in food processing industry. Besides reducing unnecessary wastage and losses of perishable items it helps in value addition, raising rural income by generating direct and indirect employment, diversify rural economy and faster industrialisation. Above all it makes the product attractive, marketable and demandable. Seasonality in production cycle, processing of highly perishable commodities and variability in the quantity and quality of raw materials are the basic features of processing industry.

The most important point in food processing industry is that a substantial portion being rural based and it has very high employment potential with significantly lower investment. The multiplier effect of investment in food processing industry is 2.5 times than in other industrial sector. Modern food processing involves the quality of life of people with

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allergies, diabetes and other those who cannot consume some common food. The significant benefits for different stakeholders involved in food processing are:

- i) Farmer – the farmers gets different benefit from the processing sector.
- ii) Consumer – the consumer can consume variety of product, new products at lower prices
- iii) Companies – the companies are able to get new business opportunities, demand growth.
- iv) Economy/Government – the processing sector generates both direct and indirect Employment and reduces the tendencies of rural migration.

Processing activities may be primary, secondary and tertiary. In case of primary processing raw ingredients are transferred in to edible form such as wheat in to the flour. In case of secondary processing the primary product are uses to manufacture other foods such as flour into bread and tertiary processing produce prepared convenience foods such as frozen dinners or canned soup etc. in India primary food processing is a major industry with lakhs of rice mills, flour mills, pulse mills and oil seed mills etc. Moreover there are several thousands of bakeries, traditional food units and fruits and vegetables/ spice processing units in unorganized sector.

Important sub sectors in the food processing industry are, fruit and vegetable processing, fish processing, milk processing, meat and poultry processing, packaged /convenience food, alcoholic beverages and soft drinks and grain processing. The fruits and vegetable is one of the most important and fast growing sub-sectors of the food processing sector as fruits and vegetables form an indispensable part of healthy diet. The fruits and vegetables farming for processing is not only employment intensive, but also enhance the gross as well as net returns to the farmers [Dileep et al 2002]. In the context of regional development it provides economic justification to build rural infrastructure. Agro industry generates new demand on the farm sector for more output, which are more suitable for processing [Srivastava 1989]. Further it creates jobs in some sectors like transportation, distribution, and retail trade as well.

With the emerging of new markets and technologies the sector has started producing many new items like ready –to-eat food, beverages, processed and frozen fruit and vegetables etc. The demand for processed food increases with the rise in income and with increased urbanization. Moreover the breakdown of joint family system, changing age profile, social changes (Increasing number of working women), life style factor tend to increase the demand for processed food.

Significant Contribution to GDP and Employment:

Indian food processing industry is estimated to be around USD 67 billion, of the USD 180 billion food industry, making it the fifth biggest in the world¹. The food industry expected to grow to USD 280 billion by 2015² and generate an additional employment for approximately 8.2 million people. It has been observed that employment potential of the food-

processing sector is much higher than other sectors. For instance, an investment of INR 10 billion generates employment for 54,000 people in the food processing sector, jobs for 48,000 people in textiles and employment of 25,000 people in the paper industry. There is also fourfold generation of indirect employment in auxiliary and other downstream activities on account of investment in the food sector. Also, 60 percent of the employment³ generation takes place in 3 small towns and rural areas. In 2010 the food processing contributed 20 percent to India's GDP.

Assam, one of the prominent states of north east India has a fertile soil conducive to cultivation of agricultural and horticultural product. Presently Food processing has the potential of providing employment to young people of the State. In most cases the fruits and vegetables grown in Assam have been sent by rail or road to other parts of the country for different purposes. Now a beginning has been made to process them in Assam itself.

There is evidence of processing units emerging and functioning in Assam. The present paper aims to investigate the working of fruits and vegetables processing units in the Kamrup district of Assam and the problems faced by them, with following objectives.

Objective of the study:-The main objectives of the study are-

- a) To determine the influencing factors on the growth of fruits and vegetables processing units in Kamrup district of Assam.
- b) To study the nature of employment and type of work involved in the sector.
- c) To identify the problems faced by fruits and vegetable processing industry in the district.
- d) To suggest some remedial measures for improvement of the industry.

Methodology: - This is a sample study based on empirical data. Here both secondary data analysis and case study methodologies are utilized. Secondary data are collected from District Industrial Centers (DIC), Food Product Order (FPO) offices, Krishi Vigyan Kendra (KVK) etc. Multistage sampling method is used. In the first stage Kamrup district is selected and then 30 fruits and vegetables processing unit from this district is selected. A systematic and simple questionnaire is prepared including the question regarding influencing factor, nature of appointment and different categories and problems they have faced. A four point continuum rating scale method for measuring the intensity of factors affecting the growth of processing units is used and the seriousness of the problems encountered by entrepreneurs is measured by three point continuum rating scale method as used by Pardeep S. Shehrawat (2006). Then Z score will be work out to determine the seriousness of the problem.

Findings and Discussion: - The study reveals that the prospects for the establishment of fruits and vegetable processing units in the district are bright. These can be classified as availability of raw materials (horticultural product), increasing demand for processed food, sufficient manpower and Government

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schemes or policies to create infrastructural facilities etc.

- a) Raw materials; -. The agro-climatic condition of the state favours the growth of variety of fruits, vegetables and spices. In Assam agricultural productivity (horticultural) is satisfactory and more than 35 percent of state domestic product comes from agriculture at constant (1980-81) prices. The production of major horticultural crops in different district of Assam are given in Table-1

Table-1
Production of fruits in Assam

Name of the fruits	Amount of production(in Lakh MT)		Districts produce the fruits and vegetables.
	2011-12	Future target(2019-20)	
1.Banana			Barpeta, Kamrup, Nalbari, Golaghat, Jorhat, Sibsagar, Tinsukia, Nagaon, Sonitpur.
	12.00	21.00	
2.Pineapple	4.15	9.00	Kamrup, Nagaon, Cachar, Karbi Anglong, Nalbari
3.Orange	1.23	2.20	Kamrup, Goalpara, Darang Dibrugarh, Tinsukia.
4.Papaya	2.00	4.50	Kamrup, Nalbari, Barpeta, Nagaon, Darang, Sonitpur.
5.Assam lemon	1.02	2.10	All districts of Assam
6. Guava	0.38	0.61	All districts of Assam
7.Jack fruit	2.15	3.00	All districts of Assam
8.Mango	0.58	1.15	All districts of Assam
9.Others(Jalp hai, Outenga, kujithekera, Amara, Silikha Jamun, Aonla, Beal etc.	0.14	0.20	All districts of Assam

Vegetables

1.Kharif	6.80	8,10	All district of Assam
2.Rabi Veg.	21.42	23.20	All district of Assam

Assam vision 2025

There are great possibilities of establishing fruit processing industry (orange, pineapple, papaya) in Boko area of Kamrup districts depending upon the availability of local fruits and vegetables. The Krishi Vigan Kendra (KVK), Kamrup was established at Kahikuchi of Azara, 18 km away from Guwahati city in the year 2004. This helps in accelerating the agricultural production and improving the socio economic condition of farming community. The

production of different types of rice, fruits and vegetables in Kamrup district are given in table-2

Table-2
Production of different types of rice, fruits and vegetables in Kamrup district

Crop/commodity	Production in M.T. KAMRUP(Metro)	Production in M.T. KAMRUP(Rural)
1. Autumn rice	1257	14828
2.Winter rice	18372	56663
3.Summer rice	17580	66485
4. Rape & Mustard	574	3996
5. Linseed	10	74
6.Banana	12925	12925
7.Pineapple	17790	17790
8.Orange	10274	10323
9.Papaya	18620	18620
10.Assam lemon	6536	6820
11.Guava	20561	18251
12.Jackfruit	9800	6654
13.Mango	10462	9261
14.other fruits	8379	7187
15.kharif vegetable	18501	18843
16.Rabi vegetable	14871	18750

Source. KVK Kamrup

Technology Mission for Integrated Development of Horticulture (TMIDH) in Assam: For achieving integrated development of Horticulture Sector, the scheme 'Technology Mission for Integrated Development of Horticulture (TMIDH)', a centrally sponsored scheme is under implementation in Assam since 2001-02 which has received overwhelming response from farmers. The impact of this scheme in the state is gradually emerging in various forms including products, productivity, infrastructure development, per capita income, commercialization etc. The major achievement were made by the director of Horticulture, Assam are given in Table-3

Table-3
Production and Productivity of Horticulture Crops due to Implementation of TMIDH

Crop	Production		Average Yield		Percentage Achievement Increase (+)/ Decrease(-)	
	2000-01	2010-11	2000-01	2010-11	Production	Average Yield
Fruit Crop	12.19	16.45	11870	12480	(+)27.1	(+)5.1
Spice Crops	1.87	2.47	2309	2530	(+)32.1	(+)9.6
Vegetable Crops	24.71	44.70	12660	17192	(+)80.9	(+)35.8

Source: Director of agriculture, Assam

- b) Since indigenous knowledge and skill of the labour is sufficient for food processing industry so it is available in Assam. The total population in Assam is 3116272 and the growth rate is 19.85 percent. Therefore cheap labor is available in Assam.

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- c) The demand for processed food is increasing due to rise in personal income, change in life style, increasing standard of living, social change, increasing number of hotel, restaurant, hostel etc. Due to shortage of time and increasing number of working women, the demand for instant baby food have increased a lot. "Bhimita" is one of the best baby processed food made from locally available 'Bhim Kol'.
- d) The expansion of tourism and hotel industry has lead to the growth and development of the food processing industry. Our Kaziranga National Park is one of the most important tourist spot which in turn has lead to the expansion of hotel industry and this lead to the increased use of processed food and has great impact on the development of the industry.
- e) Government schemes and policies: - To create an infrastructure for food processing sector the Ministry of Food Processing Industries (MOFPI) had launched new schemes during 11th five year plan. Among these Mega Food Park schemes, schemes for cold chain, value addition and preservation Infrastructure and scheme for modernization of abattoirs are important. Moreover the common infrastructural facilities for general development are available in Assam like transport and communication etc.

I) Communication infrastructure

Transportation: - The major modes of transportation in Assam are roadways, railways, airways and inland waterways. Regarding Roadways the total road length in Assam is approximately 69,000kms.covering both metalled and non-metalled surfaces. That accounts for approximately 60 percent of the total road length in the North-East.

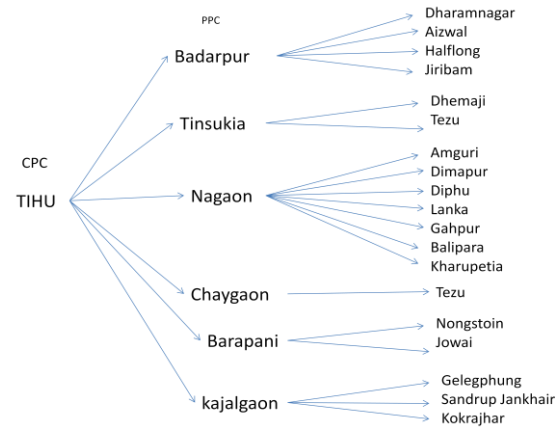
The total Railway length is approximately 2435.13 Kms. Within the state, all the major towns are well connected by the railway network. Lokapriya Gopinath Bordoloi International Airport at Guwahati (Kamrup district) is 18 Kms. from the city centre and is well connected to New Delhi, Kolkata, Mumbai and Chennai. The river Brahmaputra has been declared as the second National Waterway of the country.

From the communication point of view Kamrup is the heart of Assam and can be communicated through railway, roadway and waterways with other districts of the state. .

II) Industrial Export Infrastructure

- i) Export promotional Industrial Park: (EPIP) Assam Industrial Development Corporation has implemented an EPIP at Amingaon near Guwahati of Kamrup district at an estimated cost of Rs. 14.62 crores.
- ii) *Food processing park*: - The Government of India has sanctioned a food processing park with a total project cost of Rs. 5.95 crores during the ninth five year plan. The park is being set up near Chaygaon in the district of Kamrup.
- iii) *Mega Food Park*: - A mega food park is under construction at Nathkuchi area of Tihu town under Nalbari district (border district of Kamrup), under a

scheme of The Ministry of Food Processing Industries (MOFPI) during 11th five year plan. It carries a ray of hope to the farmers as well as to the small processors as it provides adequate infrastructure along with the value chain from the farm to the market. The Park will have a Central Processing Centre (CPC) at Nathkuchi, Tihu covering 50 acres of land supported by a network of six Primary Processing Centres(PPC) and 19 Collection Centre (CC) spread across the entire NE Region.



Network of Mega Food Park at Tihu (NALBARI)

Schemes of Financial Assistance for North East India:- Financial assistance is forwarded by the government for implementation of the Schemes. It is generally 33% up to maximum of Rs. 75 lacks.

Scheme of cold chains, value addition and preservation infrastructure for North East:- Government offer financial assistance for the cost of plant & machinery and technical civil works. It is generally 75 percent up to maximum of Rs. 10 crores. Scheme for quality control laboratories: Financial assistance to central / state Govt. and its organizations/ universities for 100% cost of laboratory equipments and for private sector organizations 70 % of cost of lab equipment and 33% of technical civil works for both.

Scheme for Human Resource Development (HRD): For HRD programme the financial assistance is given up to Rs. 75 lack to create infrastructure for courses in Food Processing Technology.

Promotional Activities: Financial assistance for organizing seminars, exhibitions for development of skilled manpower and promotion of research and development in Food processing sector is offered. It is 50% up to a maximum of rs.3 lack.

III) Utilization of industrial waste is another area of development of food processing industry in Assam. Food processing industry generates a huge volume of wastes especially at the preprocessing/raw material preparation phase. The Regional Research Laboratory of Jorhat (Assam) has produced pesticides, furfural and organic chemical on a commercial basis by utilizing agro waste of the state. Paddy husk, rice straw, decaffeinated tea waste etc

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are used to produce paper boards and building materials.

Field Study Report

The information recorded in the field study are analysed to fulfill the objectives of the study. To determine the influencing factors (1st objectives) four point continuum rating scale is used ranging from very much relevant (VMR), relevant (R), somewhat relevant (SWR) and less relevant (LR) with scores 4,3,2,1 respectively. A total choice score for each factor is worked out after knowing the responses of the entrepreneur and finally rank orders is given for each factor on the basis of weighted mean scores. The record of 30 units regarding factors are given in Table-4

Table-4
Influencing factors perceived by entrepreneurs

Sl. no	Factors	VMR (4)	R (3)	SWR (2)	LR (1)	TCS	Weighted mean score	Rank order
1	Availability of Raw materials	16	9	3	2	98	3.30	I
2	Man power supply	17	8	3	3	97	3.23	III
3	Working capital supplied by local institutions	11	9	5	5	91	2.86	VI
4	Efficient marketing system.	13	9	6	2	93	3.10	V
5	Benefit from infrastructural facilities/ government policies.	15	9	4	2	97	3.23	III
6	Help in increasing employment and income	16	8	4	2	98	3.27	II
7	Opportunity for ancillary industry	14	9	5	2	95	3.17	IV

Source:- Field study

From the analysis it is clear that availability of raw materials has been ranked at first position, followed by employment opportunity, man power supply and Benefit from infrastructural facilities/ government policies, formation of ancillary industry and marketing facilities. Last but not the least is the working capital supplied by local institutions. Therefore we can conclude that several factor helps in the growth of processing industry in Kamrup district of Assam

The volume of direct employment generated by processing industry depends upon the nature of units.

Generally the sector provides employment opportunities to the locally available manpower and therefore the share of unskilled workers is larger than skilled workers. In this study the nature of workers are divided in to following three classes.

- Permanent, the workers employed on permanent basis throughout the year.
- Temporary / casual, the workers employed according to the necessity of the unit.
- Seasonal, the workers employed only during the seasons.

In the study it is found that the employment (supply of labour) may from owner's family or from other hired sources and it is categorized as male, female and children. The result of field study regarding nature and type (category) of employment is given below in a tabular form for the period of 2011-12.

Table -5
Nature and type of employment in processing units

Nature of employment	Family members (Employee)			Hired members			Total	percentage
	Male	Female	Children	Male	Female	Children		
Permanent	25	40	-----	15	28	-----	108	32.53
Temporary/Casual	02	-----	-----	38	21	04	65	19.57
Seasonal	15	38	12	30	39	25	159	47.90
Total	42	78	12	83	88	29	332	100
Percentage	12.65	23.5	3.61	25	26.5	8.73	100	

Source:-Field study

From the table it can be observed that 30 processing units provided employment to 332 workers in 2011-12, out of which 108 (32.53 percent) are permanent, 65 (19.57 percent) are temporary and 159 (47.90 percent) are Seasonal. In case of permanent employment the share of female family members are more than others (37.04 percent). In case of temporary employment the number of male hired labour (58.46 percent) and in case of seasonal employment the number of female hired labour is greater (24.53 percent) than others. One important point to be noted in case of fruits and vegetables industry is that most of the employment from female labour. It is almost 50 percent (23.5+26.5) from both family and hired labour followed by male (12.65+25=37.65 percent) and children (3.61+8.73= 12. 34 percent). Moreover the share of seasonal labour (47.90 percent) is greater than temporary (19.57 percent) and permanent (32.53percent) labour. This clearly indicates that the fruits and vegetables processing sector employment in the district are highly biased in favour of females and seasonal labour.

The seriousness of the problems encountered by entrepreneurs in the study is measured on a three point continuum rating scale

ranging from very serious, serious and not so serious and a weightage of 3,2,1 is assigned respectively. A total choice score for each problem is worked out and converted into weighted mean score. Finally “Z” score is worked out to assess the degree of seriousness of these problems and rank order is given on the basis of Z values. A problem is considered as very serious when the value is greater than 1, serious when it is in between +1 and -1 and not so serious with Z value less than -1. The result of the field study is analysed here.

Table-6
Problems encountered by entrepreneurs by establishment of suitable units

Sl.No	Nature of the problems	VS (3)	S (2)	N S (1)	Total score	Weighted mean Score	Z-score	Seriousness of the problems	Rank
1	Lake of up to date procurement technique of raw materials	18	9	3	75	2.50	0.14	S	IV
2	Inadequate use of cold storage.	18	8	4	74	2.47	-0.07	S	V
3	Unwillingness to work in local area.	17	9	4	73	2.43	-0.34	S	VI
4	Lake of working capital.(Finance)	24	6	0	84	2.80	2.21	VS	I
5	Non availability of improved technology	17	8	5	72	2.40	-0.55	S	VII
6	Training institution gives less importance to the objectives and selection of proper entrepreneur.	17	9	4	73	2.43	-0.34	S	VI
7	Difficulty in getting money from buyers after sale	18	7	5	73	2.43	-0.34	S	VI
8	Problem of transportation	15	9	6	69	2.30	-1.24	NSS	IX
9	No electric connection in the area	21	6	3	78	2.60	0.83	S	III
10	Problem of frequent power cut.	22	7	1	81	2.70	1.52	VS	II
11	The unit faces the problem of competition from foreign	16	9	5	71	2.37	-0.76	S	VIII

	product.								
12	Long and complicated procedure to avail institutional help like registration etc.	18	6	6	72	2.40	-0.55	S	VII

Source: field study

Mean = 2.48

VS-Very Serious
S- Serious

Standard Deviation = 0.145
Z= x-m/s.d.

NSS- Not So Serious

The study reveals that the problem of finance (Z score = 2.21) and power cut (Z score = 1.52) is found to be very serious problem encountered by entrepreneur. Non availability of electric connection (Z score =0.83), procurement problem (Z score =0.14), Inadequate use of cold storage (Z score = - 0.07), Unwillingness to work in local area, (Z score = - 0.34), less importance of training institutions (Z score = - 0.34), difficulty of getting money after sale (Z score = - 0.34), Non availability of improved technology (Z score = - 0.55), Long and complicated procedure to avail institutional help like registration etc. (Z score = - 0.55), problem of competition from foreign product (Z score = - 0.76) is found as serious problem among the entrepreneur. Problem of transportation (Z score = - 1.24) is found not so serious. It is also found that many of the entrepreneur unable to get the required assistance from different financial institutions because of their lengthy procedures. Again they have no sufficient capital for day to day requirement to purchase raw materials, transportation and others. As a result of this the entrepreneurs have to take the money from the money lender and private financial agencies at high rate of interest or closed the unit. From these findings we can say that the governments of developing countries are not providing sufficient support and incentives regarding finance, management etc which badly affect the economic viability of the units. Regarding the organisation of entrepreneurial training programme no more publicity is given by different institutions and the entrepreneurs remain unknown about the schedule of these training.

Conclusion and suggestions:

At last it can be concluded that the prospect of fruit and vegetable processing industry in Assam is bright. With large amount of local raw materials, infrastructural facilities, establishment of training institutions etc helps the entrepreneur to establish the food processing industry in the state. The contribution of fruits and vegetables processing units to gross domestic product and gross district domestic product of Kamrup district is larger than common belief. The sector has emerged as a major employer in the economy of the district as well as in the state. In addition to these the study reveals that the sector in

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the district faces some serious problems like capital, procurement of raw material, power supply etc.

The Government officials and the others who are involved in the sector must perform awareness raising activities for the development of food processing sector. However, before setting up any food processing unit in the region, the entrepreneur is to make a thorough survey (SOWT analysis) about the availability of local fruits and vegetables, the power position, soft water, availability of labors, packaging materials etc.

Entrepreneurial training programmes related to the problems should be organized for small entrepreneurs so that they can gain the skill and knowledge. Moreover technology up gradation, financial management, material management, manufacturing techniques of agro products, brand promotion, advertising the product are some important areas of training needed by food processing entrepreneurs. Training should be given regarding environmental management, business opportunities and guidance, processing of agro products, labor management and procurement of raw materials.

The system of contract farming must be encouraged which can solve the problem of procurement of raw materials. The industry should be set up technically suitable for processing multiple food items over different seasons.

Proper coverage should be given to all entrepreneurs regarding Govt. sponsored programmes. Before imparting training, the selections of the entrepreneur must be done after reviewing their project, objectives in a channelised manner. The resource persons must be experienced and have enough orientation to the programme.

Food processing industry should be brought under an independent ministry of food processing industry at state level to coordinate with food processing ministry at the centre to avail the benefits of various central schemes.

The general public should be given large scale publicity about the use of processed product. There are various opportunities and schemes forwarded by government and other levels, our entrepreneurs should utilize these opportunities for the development of their own as well as the state economy as a whole.

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Abbreviation used

1. ASAMB:-Assam State Agriculture Marketing Board
2. ASFAC:-Assam Small Farmers Agri-Business Consortium
3. DIC: - District Industrial Center
4. EPIP: - Export promotional Industrial Park
5. FPO: - Food Product Order
6. GDP: - Gross Domestic Product
7. IARI:-Indian Agricultural Research Institutions
8. SOWT: - Strength Opportunity Weakness and Thresh
9. USD: US Dollar
10. INR:- Indian Rupee
11. KVK: - Krishi Vigan Kendra
12. MOFPI: - Ministry of Food processing industries
13. R&D:- Research and development
14. TMIDH: - Technology Mission for Integrated Development of Horticulture