Rural Marketing System in the North Eastern States: Problems, Diagnosis and Strategy Perspective

Content

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CHAPTER 1

INTRODUCTION

Background of the Study

The economy of the northeastern region is predominantly agriculture comprising agriculture and horticultural crops. The rural marketing is largely unorganized in the region and dominated by the private traders. The northeastern states have observed high production of fruits, spices and cashew in the recent past but could not fetch market price to the farmers at par with the markets in the other states. The topography of the NE states is not favorable for the movement of the products. Besides, the infrastructure, procurement practices, marketing approaches and processing facilities are also observed as the major constraints in the rural marketing in the NE region. The social and cultural taboos are also responsible to a large extent in not developing agro-industries in the region to provide better value addition to the horticultural crops. It is hence, necessary to diagnose the problems in the NE region for providing improved marketing environment and value added economic benefits to the farmers through better management of various post-harvest functions of the horticultural crops.

The Planning Commission, Government of India, has awarded this study to Administrative Staff College of India. The study was conceived after holding discussions with the senior officials and Economic Advisor (DP), Planning Commission, Government of India, during his visit to ASCI.

Scope of the Study

The economy of the northeastern region is predominantly agriculture consisting of agriculture and horticultural crops. That the North-Eastern Region of India is an untapped reservoir of potential for development of horticulture is stating the obvious. Abounding in crops like Banana, Pineapple, Cashew, Citrus, Ginger and Onions

which have high commercial valve before or after processing, the region seems to have already missed a great opportunity as Post-liberalized India is looking forward to penetrating international markets for some of Indian Horticultural products like grapes and mangoes as has happened in ports of Maharashtra, Andhra Pradesh and Karnataka.

The rural marketing is largely unorganized in the region and dominated by the private traders. The northeastern states have high production of fruits, spices and cashew in the recent past but could not fetch market price equivalent to the other states. The topography of the NE states is not favorable for the movement of the products. Besides, the infrastructure, procurement practices, marketing approaches and processing facilities are also observed as the major constraints in the rural marketing in the NE region. The social and cultural taboos are also responsible to a large extent in not developing agro-industries in the region to provide better value addition to the horticultural crops. Therefore it is, necessary to diagnose the problems in the NE region, in order to provide improved marketing environment and economic benefits to the farmers through better post-harvest management of the horticultural crops.

Context and Objectives of the Study

In recognition of the vast scope that exists in the north eastern region for improving the socio-economic condition of the farmers through better post-harvest management of horticultural produce with specific emphasis on marketing, the study is designed covering three states of Assam, Meghalaya and Tripura.

The specific objectives of the study will be as under:

- To assess the existing infrastructure and policy support from the state and central government for post-harvest management and marketing of horticultural produce,

- To study the existing practices for procurement, pricing and payments to the horticulture farmers on their produce and problems thereof.
- To study the institutional arrangements and economic linkages across the area of study
- To study the existing agro-processing network in terms of constraints related to capacity, productivity and overall viability, and
- To suggest policy measures to overcome the constraints in the present system and identify areas for more in-depth study in future.

Methodology

The states of Assam, Meghalaya and Tripura are selected for the study. This diagnostic study is based on the available secondary data to be provided by the Planning Commission and the concerned State Governments. Detailed discussions were held with the senior officers heading departments/marketing institutions for horticultural development in the above states besides visiting selected marketing centres. Three districts namely Kamrup in Assam, East Garo in Meghalaya and North Tripura in Tripura states have been identified for the collection of primary data from the farmers. In all, 142 farmers in the selected districts have been covered under the study. The primary data has been collected by administering a pre-coded computerized schedule to farmers in an identified district of the selected states. This is an exploratory study in reference to the above objectives to find out the existing status of rural marketing in the region and suggest policy measures.

Major Variables of the Study

The major issues to be covered during the study will include major horticultural crops-area, production and yield, marketable surplus, marketing Institutions, infrastructure, logistics such as cold storage, warehouses, rural godowns, transportation; procurement pattern, pricing, processing infrastructure, packaging, retailing, marketing finance etc.

Organization of the Report

The report has been divided into Seven Chapters. The overview of agricultural marketing in the northeastern states has been presented in the Chapter II which discusses the scenario of agricultural marketing and major problems prevailing across the region. The profile of rural marketing pertaining to farm and non-farm sector is discusses in the Chapter Iii, IV and V for the states of Assam, Tripura and Meghalaya. These chapter delineate the general economy of the state, land use and cropping pattern, technology, extension services, agricultural and horticultural marketing practices, processing facilities marketing system of non-farm products and state plans for the promotion of rural markets. The perceptions of farmers based on the primary data in reference the marketing of farm and non-farm produce is discussed in Chapter VI. The Chapter VII presents the summary and recommendations of the study.

Table – 1.1

Rice Total From 1984-89

State		1984-85	1989-90	1994-95	1997-98	2000-01	2004-05
ARUNACHAL PRADESH	Area	108	121.3	109.4	120		
	Production	117.6	138.8	105.8	129.5		
	Yield	1088	1144	967	1079		
ASSAM	Area	2324.8	2435.1	2450.5	2489.8		
	Production	2438	2794.8	3309.1	3382.9		
	Yield	1049	1149	1350	1359		
MANIPUR	Area	167.4	162.4	158.9	157.9		
	Production	333	245.1	478.3	351.7		
	Yield	1989	1509	3010	2227		
MEGHLAYA	Area	111.4	104.4	103.2	157.9		
	Production	125.2	116.7	111.5	150.1		
	Yield	1124	1118	108	1427		
MIZORAM	Area	47.5	53	66.9	68.1		
	Production	40.9	59.2	100.2	110.6		
	Yield	861	1117	1498	1624		
NAGALAND	Area	120.9	127.4	136	145		
	Production	102.4	150	174	187		
	Yield	847	1177	1279	1290		
TRIPURA	Area	266	250.2	255.9	257.8		
	Production	373	459.1	413.9	535.8		
	Yield	1402	1835	1617	2078		

Table –1.2

Rice Total From 1989-94

State		1989-90	1990-91	1991-92	1992-93	1993-94	
ARUNACHAL PRADESH	Area	121.3	121.8	122	115.3	122	
	Production	138.8	142.5	143.1	116.9	144	
	Yield	1144	1170	1173	1014	1180	
ASSAM	Area	2435.1	2490	2527.7	2522.6	2525.7	
	Production	2794.8	3270.2	3197.2	3299.7	3361.1	
	Yield	1149	1313	1265	1308	1331	
MANIPUR	Area	162.4	157.4	160.3	149.7	161.9	
	Production	245.1	274.2	340.5	269.3	346.6	
	Yield	1509	1742	2124	1799	2154	
MEGHALAYA	Area	104.4	103.6	104.5	104.2	104.2	
	Production	116.7	119.8	121.1	114	114	
	Yield	1118	1155	115.9	1094	1094	
MIZORAM	Area	53	51.3	55.6	61.3	62.5	
	Production	59.2	63.8	71	84	96.7	
	Yield	1117	1244	1277	1370	1547	
NAGALAND	Area	127.4	127.4	129	135	134	
	Production	150	156.3	154	176	180	
	Yield	1177	1227	1194	1304	1343	
TRIPURA	Area	250.2	274	257.1	241.6	241.6	
	Production	459.1	501.3	474.5	438.1	438.1	
	Yield	1835	1830	1846	1813	1813	

Table –1.3

Rice Total From1994-2005

State		1994-95	1995-96	1996-97	1997-98	2000-01	2004-05
ARUNACHAL PRADESH	Area	109.4	118.7	115.8	120		
	Production	105.8	124.5	129.4	129.5		
	Yeild	967	1049	1117	1079		
ASSAM	Area	2450.5	2503.4	2491.7	2489.8		
	Production	3309.1	3390	3328.2	3382.9		
	Yeild	1350	1354	1336	1359		
MANIPUR	Area	158.9	154.4	166.1	157.9		
	Production	478.3	331.8	367.3	351.7		
	Yeild	3010	2149	2211	2227		
MEGHALAYA	Area	103.2	104	104.8	157.9		
	Production	111.5	111.8	141.1	150.1		
	Yeild	108	1075	1346	1427		
MIZORAM	Area	66.9	65.8	64.7	68.1		
	Production	100.2	101.5	111.2	110.6		
	Yeild	1498	1543	1719	1624		
NAGALAND	Area	136	140	140	145		
	Production	174	185	153	187		
	Yeild	1279	1321	1093	1290		
TRIPURA	Area	255.9	231.5	258.9	257.8		
	Production	413.9	465.5	544.8	535.8		
	Yield	1617	2011	2104	2078		

CHAPTER 2

AGRICULTURAL MARKETING SYSTEM IN NORTHEASTERN STATES

Indian agriculture has recorded substantial growth during post- independence period of planned development beginning with the First Five Year Plan in 1951-52. Despite significant growth in agricultural production, income disparities between the developed and underdeveloped agricultural regions in the country have widened. Consequently, the Indian agriculture has been divided into two segments, firstly, dynamic or progressing and secondly, the backward and stagnating. It is in the latter segment, that little dent has been made into the basic problems of resource allocation, technology, marketing and media development. The Northeastern states of the country fall in the latter category where topographical heterogeneity and cultural factors act as constraints.

Agricultural Production and Marketing in NE Region

Since the economy of the NE Region is essentially agro-based having 77 per cent of the working population engaged in agricultural operations, the development of agricultural marketing system bears considerable importance. The total foodgrain production in the region amounts to 430.96 Lac tons in 1985-86, but very small quantity of marketable surplus is sold in the regulated markets. According to an estimate, about 28 per cent arrival of paddy was recorded during the year 1987-88. Among cereals, paddy is the principal crop grown in the northeastern states, which

occupies 63.34 per cent share of the total area under foodgrains in the region. Maize is the next important crop grown in the NE Region except Tripura. However, the pulses are cultivated in small quantities in all except Arunachal Pradesh. It shows that a major share of marketable surplus finds its outlet in the poorly equipped markets held periodically in the villages. Most of the transactions in the rural markets involve small quantity of agricultural Produce to purchase the commodities of daily requirements. The private traders, middleman, petty retailers and moneylenders locally known as *'Mahajans'* dominate these markets. The bargaining power of the farmers is very weak and, therefore, the traders dictate the price. One of the main reasons for prominence of traders in the agricultural produce markets in villages is the heavy indebtedness of the farmers to traders, commission agents and middleman. Besides the organizational and functional dimensions of the marketing system, the flow of commodities in the NE region is restricted and localized to certain specific areas due to geophysical conditions as well as lack of infrastructure facilities. Consequently, the factors of marketing such as pricing, backward and forward linkages, demand and supply of commodities are greatly affected to the disadvantage of both the producers and the consumers. The basic infrastructure facilities include storage and warehousing, road links, transportation and communication aids. Of these, storage and transportation network performs a significant role in stocking and mobilization of goods. The storage facilities in NE Region are located mainly at district headquarters and state capitals. Till recently there were practically no rural godowns in the region. The National Cooperative Development Corporation (NCDC) has, however, pioneered the construction of rural go-downs work in the region. Topographically, the region is crisscrossed by a large number of rivers and rivulets and nearly 70 per cent of the total area is mountainous. Under such conditions the road transport network is the main mode of conveyance to link inter and intra-state movements of goods and services. But road transport is also hampered due to lack of all-weather road links in the region.

Though the impact of green revolution in this region is comparably low, the volume of marketable surplus of agricultural produce has increased substantially during the

last few years. The existing marketing system is three-tier as in other parts of the country. The primary markets are held periodically at village level, wholesale assembling markets at block level and terminal markets located at towns and at the places from where the goods could be transported. The trade, however, is not regulated due to the absence of enforcement of market regulations in the primary and wholesales produce assembling markets. Among all the NE-states, Assam and Tripura have, to some extent, succeeded in the enactment of market acts to ensure efficient marketing of agricultural products.

Marketing System

Marketing of agricultural commodities in the northeastern states, by and large, is dominated by the private traders due to the absence of proper implementation of market regulation act by the state agricultural marketing boards. Among the seven states in the region, Assam, Meghalaya and Tripura have market regulation act and of these only in Tripura it has been enacted and implemented to some extent for non-food grain crops like jute and mesta. In Assam, the implementation process is hampered due to various litigations put up by the traders. The agricultural produce marketing act in Meghalaya has been enacted but it is yet to be implemented while in Manipur preparation of the bill is in process. A brief description of the trade practices related to agricultural commodities in different states of the region is given below.

Assam

Assam is basically an agricultural state. The rural population is about 89 per cent living in 21,995 villages. Out of the total rural population about 80 per cent depend directly upon agriculture. The overall economy of the state depends upon the agricultural development and, hence, agricultural sector has been receiving considerable attention in the planning process. Assam grows a large number of

agricultural crops like paddy, pulses, oilseed, spices, fiber crop like jute, mesta and cotton and fruits and vegetables.

Under the existing system of agricultural marketing in Assam, farm produces change many hands before reaching the consumer. The middleman, in the process extracts a large share of consumer's rupee while the farmer gets only a small share. Taking advantage of the farmer's poor condition and weak bargaining power in the transaction, a set of middleman at different stages have emerged as a powerful channel for the procurement of food grains. They by and large, dictate the price. Thus, the farmer needs protection from such exploitation and also assistance in many respects, more so in a state like Assam where the agriculturists are subject to natural calamities and various other constraints.

There are 1273 markets in Assam comprising primary and secondary markets. The farmers also sell their produce at the farm itself to itinerant merchants and such sales constitute about 60 per cent of the total marketable surplus. Of the remaining a certain percentage is also sold by the growers to village *mahajans* at their business premises. The *Dadan* system is still prevalent in rural areas. Under this system, the village moneylenders advance loans to the cultivators at the time of need making it obligatory on the part of the farmer to deliver their produces after harvest at a price offered by the moneylender. Such price is much lower than the market price. The credit offered under this system is not less than 25 per cent of the total annual credit needs of the farmers in the state.

Though considerable progress has been made in the field of regulation of markets in the country, Assam has initiated regulation of markets only in 1972. The Assam Agricultural Produce Market Act, 1972 has been implemented with effect from June 15, 1977. There are 67 urban markets brought under regulation. The Market Board is also aimed at development of a few important fruits and vegetable markets in the major producing areas in the state. Provisionally Howly, Mangaldoi, Dhing and Tinsukhia have been selected for the purpose.

There is no separate independent Directorate of Agricultural Marketing in the State. The Agricultural Marketing Schemes are being supervised directly by the Joint Director of Agricultural Marketing, Assam. Four schemes viz. Development of Market Intelligence, Development of Marketing of Fruits and vegetables, Development of Jute Grading and Bailing and Development of Quality Control and AGMARK Grading are implemented in the plain districts by the Deputy Director of Agriculture (Marketing) with headquarters at Guwahati. The scheme for development of Regulated Market is directly implemented by the Assam State Agricultural Marketing Board, a statutory body constituted under section 3 (1) of the Assam Agricultural Produce Market Act, 1972 (Assam Act XXIII of 1974 with amendment in 1983). The Assam State Agricultural Marketing Board with headquarters at Guwahati is an apex body established in 1976 for exercising superintendence and control over the Market Committees for systematic development of markets and for better regulation of buying and selling of notified agricultural commodities in notified market areas.

The Board is responsible for supervision, control and monitoring activities under the market committees as per the provisions under Act and Rules. The market committees are guided by the Market Board for improvement of markets, classification of market committees, grading and standardization of agricultural produces and for other purposes to promote the interest of market committees as and when necessary. For this purpose the Market Board makes uniform policy for development of markets in the State.

In each market area, there is one principal market yard and one or more sub-market yards. The number of sub-market yards would be more in a market area as and when necessary, for the display of incoming produce. The State Government establishes a market committee for every area declared to be a market area under the provisions of the Act. The duties and responsibilities of the market committees

are clearly laid down in the provisions under the Act and Rules which mainly pertain to the collection of revenue, grading, forward trading, auction and price control and farmers' welfare by providing all amenities in the market place.

According to a survey conducted by the marketing board the farmers are losing at least 1 0 per cent of the market price due to lack of proper sale arrangements in markets. In addition, farmers do not undertake proper cleaning and grading of the produce before sales, which is also, one of the reasons for low price. Regulated markets take up such quality improvement measures to increase the value of the produces in the market. Properly cleaned and graded produce normally fetches a minimum premium of 5 per cent in the price as estimated.

Adoption of the measures as envisaged in the regulated market scheme is expected to benefit the producer-farmers by about 20 per cent of the total value of the produce according to a survey report of the Marketing Board. Infrastructure facilities like godowns, auction platforms, assortment shed and jute bailing press have already been created in all the four major regulated markets in the jute producing districts.

Manipur

Marketing of agricultural produce in Manipur has not been systematically organized. The lion's share of the consumers' rupee goes to the pockets of innumerable middlemen working in between the producer and the ultimate consumer. The agriculturists of Manipur are generally the persons of small means. Their holdings are small and scattered. As such, they have got very little quantity of agricultural produce available individually as a marketable surplus to be disposed off. Obviously it becomes uneconomical to carry the small quantity of produce to the assembling markets located at distant places where middlemen operate at different stages. Under the prevailing practice in the state farm produce is collected

from the producers in the interior villages and are brought to a central point, which is the assembling centre, by the womenfolk. Sometimes agriculturists sell their produce to the itinerant merchants. From the village markets it is procured by the itinerant merchants and agents of wholesalers belonging to towns such as lrnphal, Singjarnei, Thoubal, Kakehing, Bishenpur, Moirang, Churanchandpur and the like.

The transport that gives “place utility” to a farm product is one of the main problems in Manipur. As motorable roads do not properly connect most of the production areas, the farmers find it difficult to bring their produce to the primary and terminal markets for sale and thus deprive themselves of remunerative prices. In some interior areas, there is no road at all and even bullock carts as a means of transport for bringing farm products to the assembling centres cannot be used. Consequently, the farmers have to sell their commodities at a lower and uneconomical price to the itinerant traders at their farm itself. Regarding market charges, it seems that the prevailing system in Manipur is different than those prevalent in the unregulated markets in other parts of the country. In Manipur, the sellers have the advantage of not paying any charges like Gosala (Cattle Cess), Dharmoda (Charity), Dalaii (Commission). There are about 30 assembling markets and 103 primary markets and no regulated markets in the state.

Constraints. Road transport is the only means of transport for farm products to distant places as there is no rail link in the state. During rainy and few months of post-rnonsoon season water transport by boat is also used in some places. In the rnonsoon season due to bad road conditions and tear of landslides, the transport charges are very high. Again the cost of transport by road is not uniform as it varies according to the condition of the roads. Inadequate transport facility causes glut in the producing area and scarcity in consuming centres at times affecting both the producer for receiving in lower price and the consumer due to irregular supply and high retail price.

So far there is neither any private nor corporate body to disseminate market information for the benefit of the producers and consumers. As such the farmers who are in the villages have no chance to know the prevailing prices at district and state level markets. The daily prices are also not broadcast through the All India Radio, Imphal.

There is a general shortage of storage facilities in both the urban and rural areas of the state. The prevailing systems of storage in the rural and urban areas are quite primitive and they cannot be regarded as satisfactory. There are no warehousing and cold storage facilities. Due to lack of storage facilities, the bulk of the agricultural produce is sold in the village. The itinerant traders and small merchants purchase the produce in village immediately after harvest. They either store it in the shops of the big merchants or sell the produce to the wholesalers or consumers. The big merchants purchase the produce and store it in their own godowns till better prices prevail and reap the benefits of escalated prices. As the farmers do not have the storage facilities and enough finance to meet their requirements, they are deprived of their genuine share in the price hike. The volume of potatoes produced in the State could meet the demand if cold storage facilities are made available and there would be no need to import potato at a higher price during off-season.

Meghalaya

Agriculture is the main occupation in Meghalaya in spite of the fact that only about 10 per cent of the total land is available for cultivation in the hilly terrain of the State. About 82 per cent of the total population of the State live in rural areas and mainly depend on agriculture for their livelihood. Paddy is the main food-crop grown in the state. Besides maize, wheat, millets and pulses, potato, jute and rnesta, cotton, mustard, ginger, turmeric, areca nut and betel leaf are some of the important cash crops produced in the state. Among the horticultural crops, banana, pineapple, citrus fruits mainly oranges are grown in abundance in medium and lower altitude

regions and fruits like plum, pears and peaches are grown in the high altitude temperate region. Though the state is deficit in terms of food grains production, there is surplus cash crops and horticultural crops.

Lack of proper marketing outlets in the State is a deterrent factor for increasing productivity and production. The production function is complete when marketing is so arranged that who is assured the producer of a fair return for the labour and other inputs investment made for producing a commodity. Unless a farmer gets remunerative price for the produce he will not go for increasing production. Meghalaya so far does not have the required base and the infrastructure facilities for organized agricultural marketing. Marketing of surplus agricultural produce as well as the procurement of the necessary agricultural inputs and the daily requirements of the people in the State is a problem to be tackled. There are a number of constraints such as transport, communication, suitable organized marketing set-up, weak cooperative organization, and deplorable conditions of the primary markets in the rural areas of the state.

These problems are very much pronounced in the southwestern part of the State bordering Bangladesh. Free trade, which existed with the people of East Bengal, was dislocated and closed down with the partition of the country. The private traders have, by and large, monopolized the trade and commerce in the state. Marketing of surplus agricultural produce and other minor forest produce, supply of essential foodstuffs, agricultural inputs etc. are mostly handled by the private traders. The traders are well organized and are in an. advantageous position that dictates their terms as far as the procurement of the surplus agricultural produce is concerned. Farmers, in general, bring their surplus produce from distant villages to the market for disposal and at times, not being aware of the prevailing market trends resort to distress sales. As such the price situation of the surplus agricultural produce is very much fluctuating particularly for the perishable produce like, potato, ginger, fruits and

vegetables. The middleman in the process takes advantage of the situation at the cost of the producer and the consumer as well.

On the basis of the total geographical area and population of the state each primary market is serving around 16,000 people covering a land surface area of about 261 square km on an average. There is no uniform pattern of organizational and management set-up of these markets. The local autonomous administrative bodies are the controlling authorities over these markets including collection of tools and levies without having any control on the price of quality of the produce sold in the market. The primary markets in the rural areas do not have required facilities of a regular and economic transport. Besides, the market stalls are not properly laid down and are mostly of temporary structure made of thatches and bamboo. Basic amenities like godowns or storage facilities, drainage and pavement, parking facilities, supply of drinking water are generally not available in these markets. Therefore, establishment of an efficient agricultural marketing system where the growers may obtain a remunerative price for their produce is most essential for the accelerated development and commercialization of agriculture in the state.

Tripura

The Tripura Agricultural Produce Markets (Amendment) Act, 1983 has been enacted for the establishment of the Tripura Agricultural Produce Market Board and subsequent amendment was proposed for the constitution of Market Committee of Regulated Markets to increase the number of members. The Tripura Agricultural Produce Markets (Administration) rules, 1985 was framed to allocate powers to the Marketing Board and Committees. In the regulated markets paddy and banana are notified as transaction able commodities. The paddy is admissible in the regulated markets in husked or raw form for transactions. The transactions are made by open regulations between the buyers and the sellers.

Some of the markets have been provided with minimum required amenities while the remaining markets have yet to be covered. The minimum basic facilities to be provided at the regulated market are: (a) Sale Hall (Auction platform), (b) Sale Stall, (c) Market Committee's Office, (d) Godown, (e) Internal Brick lined pathways, including approach road, (f) Providing drinking water facilities, (g) Sanitary block with drainage system.

Arunachal Pradesh

In Arunachal Pradesh, there are no regulated markets and the whole trade moves around the private merchants who mostly procure the commodities at local markets in villages held periodically. The traders take the contract of standing crops particularly paddy and fruit and harvest it at their cost paying less price than prevailing market price. The cooperatives are mainly the distributing agencies for consumer goods and do not enter into the product market for procurement of food grains, fruits or vegetables. The itinerant traders visit the villages all the six days in a week and collect the produce from them. The conditions of the state do not allow for free and uninterrupted transportation.

Cooperative Marketing

In the northeastern states the cooperatives dealing with food grain marketing are weak in terms of organizational set-up and financial condition. The cooperative marketing societies in the region though established extensively, most of them are defective due to lack of marketable surplus of agricultural commodity and price manipulation by the private traders.

In Assam, large number of cooperative marketing societies are not handling the procurement of agricultural produce. The State Cooperative Marketing Federation has also weak resource base and is dormant in marketing activities. Since the regulated markets and the cooperatives are not active in the state, paddy is mostly

sold to the private traders. The Food Corporation of India is also procuring rice under levy from processors.

Manipur

The marketing of agricultural commodities in the state is largely unorganized. In the absence of regulated markets for the agricultural commodities, the private trades have dominated the agricultural and horticultural produce marketing activities in the state. The idea to establish a parallel marketing institution through cooperatives has also received a setback due to reorganization of societies. Most of these societies have become defunct due to reorganization of Primary Agricultural Credit Societies (PACS). These reorganized PACS has taken up the marketing of agricultural products by their area of operation is very limited due to paucity of finances. The main commodity procured by these societies is paddy. Though PACS are mains, the credit agencies in cooperative sector some of them have also taken up marketing as an additional activity.

Meghalaya

The cooperative marketing net-work in the state has been set-up for the horticultural production specifically for fruits like pineapple and orange There are 5 Horticultural Produce Cooperative Marketing Societies located within Pynursia block.. The members of these societies are engaged in procurement of horticultural and minor forest products and distribution (consumer goods. The commodity procured in these societies is *Soli* in the open market through its own outlets and private traders engage in wholesale and retail trade of fruits and vegetables.

Tripura

The primary cooperative marketing societies are procuring specially jute, mesta and jute seeds, paddy and oilseeds grown by the tribe through *Jhum* cultivation. The cooperatives procure mainly from the members as sub-agents of Tripura Apex Cooperative marketing Society Limited under price support scheme. Paddy is the main crop among food grains which the societies are unable to procure it as the open market price of paddy is higher than support price and is dominated by the private traders. The societies are also engaged in distribution of essential commodities through retail outlets and fair price shops. Apart from primary agricultural produce Cooperative Marketing Societies there are also Large-scale Multipurpose Cooperative marketing Societies (LAMPS) mainly dealing with jute procurement.

Private Trading

The commodity transactions are done in many ways in the northeastern region. A substantial part of the total produce disposed off by farmers to the local traders and moneylender. They offer lower price as compared to the market price. One of the major bottlenecks of the marketing system at village level is that the local traders and farmers undertake agreement for the standing crop before harvest for the relative lower price. The farmers sell a large part of their produce in the periodic markets which is purchased in bulk by the local traders, while a lesser portion of farm produce is parted with the growers' societies. The local traders in-turn sell the assembled produce to the whole-sellers and are redistributed to processors and a portion of it to the consumers through retailers.

The itinerant traders move from village to village collecting produce from farmers and bring them to the nearest markets. Because of lack of transport facilities,

storage capacity and fear of being cheated in the market, the small peasants offer their produce to the itinerant traders at a relatively cheaper price Sometimes the moneylenders provide them with loans on the condition that they will sell their produce to them only. It is also observed that the shopkeepers and the traders in the rural market centres sell on credit essential consumer commodities to the peasants during natural calamities or at times of dire necessity. In next harvest, the farmers realize their loans paying high rates of interest in terms of agricultural produce at low prices. Often moneylenders act as commission agents of the wholesale traders.

Transaction of agricultural produce also takes place in the periodic markets, which are held once or twice a week. Besides, fairs are held once in a year or so in important villages or towns. The farmers often sell a part of their produce in these markets. It is worth noting here that in these markets sellers of a particular commodity usually sit together in rows facing each other in a particular quarter specially set aside for them. The womenfolk of the hill people carry their produce to the market. Sometimes they have to traverse a long distance of about 5 to 1 0 kilometer with a head load along narrow footpaths made of rough stones which connect one village with another. These footpaths are often steep and slippery in the rainy season. The periodic markets in the hills are monopolized by the agents of wholesale merchants, who may decide collectively not to offer the usual price on one pretext or another. Most of these markets are very poorly equipped, uncovered, lack of storage, stall age, drainage, and other facilities. In addition, the roads linking most of these markets to towns and wholesale markets are poor in condition. Some markets particularly in hilly areas are without road. It is important to note that only small and marginal farmers sell their produce in such markets. The big farmers with large surplus sell their produce in the wholesale markets.

Problems of the Non-Farm Sector Enterprises

Handlooms and handicrafts are the major non-farm employment and income generating activities in the rural areas. The integrated action plan for promotion of these activities in the selected districts constitutes the identification of the craft and handloom weaving potential, economic linkages, infrastructure, technology and skill development and strategy for the overall development of the craft. Besides, the scope of the project includes also to develop bankable projects for providing credit to the artisans and handloom weavers in consultation with the local and specialized financing institutions like rural and commercial banks, SIDBI, NABARD and the like.

Assam has largely the crafts culture of hilly terrain. The crafts of Assam which are popular across the states include cane and bamboo products, wood work , brass and metal work, toys and dolls and *sholapith*. Artisans were found not enterprising enough to sell or export the finished items on their own. Bulk of the finished output (91.5%) was handed over to middlemen and/or traders. It was only bamboo craft , wood work and paper mashie industry that some exports were done by the artisans themselves. Among the crafts, wage-earning artisans in the imitation jewellery craft received the highest wage rates. The daily wage rates were found to increase at an annual rate of 5.9 to 6.2 per cent during the last ten years. Income from handicraft activity formed 88.2 per cent of their family income of a self- employed artisan and 72.7 per cent of the income of a wage-earning artisan. The common work sheds are not available to a large number of artisans in the all the sample districts. The working capital is often insufficient for the artisans to procure the raw material and manufacture the marketable craft items for quick sales. The artisans do not have any technical and other support to lead their activities for establishing better marketing linkages.

The data reveals that 44.7 percent artisans feel that the domestic market for the crafts is declining shapely and there is a need to look for an alternative marketing arrangement at a large scale. The artisans also face a variety of problems with the

marketing channels such as private traders, contractors and government emporia. None of the State Handicrafts Development Corporations in the selected states makes spot payments to the artisans in procuring crafts and it takes 45-60 days to settle the bills of the artisans. These Corporations largely procure the products of artisans on consignment basis. The marketing of handicrafts is also largely concentrated in the hands of the private traders.

The study revealed that the weavers are largely facing problems related to production and marketing. As stated in the pre-text, the high dependency on the master weavers and private trade linkages have put an operational crux of input supply and marketing among the primary handloom societies. It has been found during the study that 78.12 percent of weavers in all the sample states owned one loom per household costing Rs. 9000. The remaining weavers were engaged in the work sheds of the contractors/master weavers. The weavers working on their own looms or with the master weavers realize only wages amounting to Rs.20-50 per sari. The productivity per loom per weaver among the respondents was 14 saris per month on an average. The master weavers/ contractors locally known as *mahajans* supplied the raw material. They procured the finished goods from the weavers by paying the wages to them. The master weavers were found dominant in the handloom trade in the all the sample districts as no institution to support the production and marketing of handlooms and handicrafts at the village level co-exist. It has been found that about 60 percent looms are in operation in Kamrup district and the remaining looms have been closed for lack of work and marketability for their goods.

Overview

Agricultural marketing is a complex phenomenon. Involvement of a number of trade channels in the procurement of agricultural produce, the attitude of farmers towards the selling of their produce and to get immediate returns is the main factors governing the whole market operations. There are different types of problems in the marketing of agricultural and allied products pertaining to organizational, functional

and physical infrastructure aspects. The organizational aspect is mostly concerned with the state intervention in agricultural marketing by implementing the market regulation as an instrument to offer better price to the farmers and feeble the lobby of private traders. The functional aspects are concerned with the bottlenecks found in transaction during grading, weighing, pricing, payment and other marketing operations. The physical infrastructure in the northeastern region is weak in general.

Table 2.1

State		1984-85	1985-86	1986-87	1987-88	1988-89
	Area	28.1	28.1	30	30	31.8
ARUNACHAL PRADESH	Production	32.6	32.6	35	35	40.3
	Yeild	1160	1160	1167	1167	1264
	Area	19.6	19.6	18.4	18.3	16.9
ASSAM	Production	12	12	11.3	11.3	10.5
	Yeild	612	612	164	617	621
	Area	5.4	5.7	7.5	3.3	6
MANIPUR	Production	12.2	14.6	16.4	10.3	12.2
	Yeild	2259	2561	2187	3121	2033
	Area	17.6	17.8	19.2	19.2	17.9
MEGHLAYA	Production	24.1	24.2	20.1	20.1	20.6
	Yeild	1369	1360	1047	1047	1151
	Area	5.6	5.6	4	4.2	5.9
MIZORAM	Production	1306	5.8	6.5	3.9	9.5
	Yeild	1306	1036	1625	929	1610
	Area	19.9	17.5	22	22.5	22.7
NAGALAND	Production	14.2	15	72.1	9.5	19.3
	Yeild	793	857	327	422	850
	Area					
TRIPURA	Production					
	Yeild					

Table,2.2

State		1989-90	1990-91	1991-92	1992-93	1993-94
	Area	37.4	37.6	37.7	35.3	35.5
ARUNACHAL PRADESH	Production	45.3	45.7	45.9	45.6	46.7
	Yeild	1209	1215	1218	297	1315
	Area	19.7	20.6	18.6	18.9	17.7
ASSAM	Production	12.5	12.9	11.8	12.5	11.6
	Yeild	635	626	634	661	655
	Area	4.8	4.6	4	2.8	2.7
MANIPUR	Production	14.9	11.4	9.6	8.1	7.8
	Yeild	3104	2478	2400	2893	2889
	Area	18.5	18.4	18.5	17.1	17
MEGHALAYA	Production	23.4	22	23.7	20.2	20.1
	Yeild	1265	1196	1281	1181	1182
	Area	6.9	6.6	7	6.8	7.8
MIZORAM	Production	9.1	11.1	12.3	12.9	14.2
	Yeild	1319	1682	1757	1897	1821
	Area	22.9	23.9	24.9	31.5	26
NAGALAND	Production	20	22.3	25	34.9	28
	Yeild	873	933	1004	1108	1077
	Area				2.7	2.7
TRIPURA	Production				1.7	1.7
	Yeild					

Table 2.3

State		1994-95	1995-96	1996-97	1997-98	1998-99
	Area	34.7	32.9	31.2	34.5	
ARUNACHAL PRADESH	Production	46.7	45.4	45.8	50	
	Yeild	1346	1380	1468	1449	
	Area	19.2	19.1	19.1	19.2	
ASSAM	Production	12.6	13	13	14.7	
	Yeild	656	681	681	766	
	Area	4.5	2.6	6.4	3.6	
MANIPUR	Production	10.4	7.1	23.4	13.1	
	Yeild	2311	2731	3656	3639	
	Area	16.9	17	17	17.2	
MEGHALAYA	Production	20.5	21.7	25.6	24.9	
	Yeild	1213	1276	1506	1448	
	Area	8.1	7.8	8.5	8.2	
MIZORAM	Production	14.7	15.2	15.8	16.5	
	Yeild	1815	1949	1859	2012	
	Area	27	28	32	30	
NAGALAND	Production	28	31	33.5	30	
	Yeild	1037	1107	1047	1000	
	Area	2	2	2	2	
TRIPURA	Production	1.8	1.8	1.8	1.8	
	Yeild					

CHAPTER 3

RURAL MARKETING SYSTEM IN ASSAM

General Economy of the State

The economy of Assam has been affected adversely for the past few years due to inadequacy of financial resources, insurgency problems and natural calamities like flood. At the current prices the net state domestic product (NSDP) recorded a growth rate of 9.9 percent in 1998-99 as against the growth rate of 10.3 percent recorded in pervious year. In respect of per capita income the growth rate was registered only 0.4 percent as against the growth rate of 2.2 percent during 1997-98. The economy of the state is largely agricultural based and the growth in this sector has shown discouraging performance over the years. The flood problem of Assam, which is a regular feature during monsoon, as well as occurrence of drought at times continue to affect the agriculture and allied sector performance in the state. The share of agriculture sector in the NSDP at the 1993-94 prices was 37.26 percent, which declined to 34.11 percent in 1998-99. The manufacturing and processing sectors of the state has also showed an unimpressive performance during the late nineties. The processing of fruits and vegetables in the states is almost absent except a few private processing units of tomato and pineapple with meager plant utilization. The growth rate has also been found declining in the state, of rice and flourmills and oil mills. The overall index of industrial production (Base 1970=100) fell from 202 in 1997 to 200 in 1998. In all, the economy of Assam is passing through growth setbacks in various sectors.

Agriculture

Agriculture occupies a very important position in the economy of Assam and forms the major occupation of the people of the state. According to 1991 census 69 percent population of the state was dependent on farming activity. Government of Assam has assigned high priority to the various programmes in this sector in view of its contribution to the state economy.

Land Use Pattern

The provisional estimates of the land utilization statistics of the state for the year 1997-98 reveal that there exists 39.44 Lac hectare gross cropped area of which net sown area is about 27.51 Lac hectare which accounts for 53.1 percent of the total geographical area.. The area sown more than once was 12.43 Lac hectares during 1998-99. This is ratio of area sown more than once to the net area sown was observed as 45.2 percent in 1997-98, 45.4 percent in 1996-97 and 44 percent in 1995-96. A sizeable population of farmers belongs to marginal and small land holding size category and the average size of holding is 1.27 hectare in the state. The Table 3.1 shows the distribution of operational holdings in the state by different size of land holdings as per the 1991 census. The average size of operational holding has been found declining subsequently every five years from1970-71 to 1990-91 at the rate of 0.73 percent per annum. The number of marginal holdings below 1 hectare constituted 59.6 percent of the total holdings. The fragmented and small holdings were also one of the major factors in declining the production to a large extent. The figure 3.1 shows the distribution of land holdings according to categories of land size in Assam. The Table 3.2 exhibits the trend of average size of land holding in the state during 1970-90.

Cropping Pattern

The major crops cultivated in Assam are foodgrains, pulses and oilseeds. Among foodgrains rice is cultivated in autumn and winter which occupies large area under

cultivation. Crops in Rabi season are largely dominated by the oilseeds however a small area is also covered under rice during this season. Among pulses black gram occupies larger area in Rabi than green gram. The red gram is cultivated in a very limited area

Diagram 3.1 Crop Combinations Practiced in Assam

Combination 1 : *Sali* Paddy → Summer Green Gram → Black Gram → Pea → Wheat

Combination 2 : Early Ahu → Boro Paddy → *Sali* Paddy

Combination 3 : Jute → *Sali* Paddy → Winter Vegetables

Combination 4 : *Sali* Paddy → Mustard

Combination 5 : Kharif Vegetables → Mustard → Wheat → Onion → Garlic

and its production is limited to 8.5 thousand tons per annum on an average. Wheat is cultivated in the state in a limited area in Rabi season. The Diagram 3.1 exhibits the crop combination practices in the state of Assam.

Area, Production and Yield

It has been found that the area under the autumn rice has marginally decreased to 5.95 Lac hectares during 1998-99 as compared to 6.07 Lac hectares during 1997-98. The winter rice is the principal crop of Kharif season but the area under the crop is declined to 16.35 Lac hectares in 1998-99 from 17.43 Lac hectares in 1997-98. The decline in the area under winter rice is caused due to flood during monsoon, which affected all districts in the Bramhaputra valley.

In the Kharif season, oilseeds like sesame, castor, groundnut and soybean are grown in the state, which together comprises about 10 percent of the total oilseeds production in Assam. The area under Kharif pulses during 1998-99 was found to be nearly equal to the area occupied during 1997-98. Among the oilseeds grown in the Kharif season, groundnut has been found to be popularly cultivated. Among the Rabi crops grown in the state, half of the total area under cultivation are covered by rapeseed, mustard and

summer rice. The vegetable crops also occupied significant share in the Rabi season. The Table 3.3 shows the area and production of the selected crops during triennium ending 1999-2000.

The overall production of agriculture crops in the state has shown an increasing trend during the triennium ending 1999-2000. However, as per an official estimate, the production of autumn rice has decreased from 5.97 Lac ton in 1997-98 to 5.21 Lac ton in the following year. The production of winter rice has been increased during 1999-2000 from 22.88 Lac Tons to 27 Lac Tons in the state. The production of Rabi pulses has also shown a marginal increase in the production in the subsequent years.

The yield rate of autumn rice has been found to be declined to 889 kg per hectare during 1998-99 as against 1000 Kg per hectare in 1997-98. However the winter rice has shown a marginal increase in the yield rate during the above referred period. The yield rate of wheat has also shown a decreasing trend. The productivity of rapeseed and mustard has been found to be 553 Kg and 470 Kg per hectare respectively. The Table 3.4 exhibits the yield rate of major crops grown in the state. The figure 3.2 shows the yield rates of principal crops in the state

Input Management

Input distribution has been a challenging task for the functionaries at the district and the village level due to infrastructure and logistic problems in the state. The distribution of fertilizer is channeled through Apex bodies and private dealers under the control of the state department of agriculture. Some important agricultural input like seeds, pesticides, extension services, credit and the like are also arranged through various state agencies. Assam Seed Corporation Ltd. is entrusted with the production and distribution of quality seeds besides the private dealers. The Table 3.5 shows the performance of seed distribution by Assam Seeds Corporation Ltd. during 1999-2000.

The irrigation facilities in Assam are extremely limited. Out of the total gross crop area estimated about 40 Lac hectares, only 1.14 Lac hectare was irrigated during 1997-98. The private irrigation schemes are being promoted through the Assam State Minor Irrigation Development Corporation by providing institutional finance to the farmers and the cooperatives. The Table 3.6 shows the irrigation facilities made available to the farmers during 1997-98. The state government has attempted to utilize the ground water through the installation of tube wells. The achievement made during 1997-2000 is exhibited in the Table 3.6 (A). The agricultural machineries include tractors, power tiller, paddy and dry land weed separators. The bullock driven ploughs and other irrigation equipments are in large number in the state. The Table 3.6 (B) details the status of farm mechanization in the state.

Technology

The agriculture technology development and dissemination has been entrusted to the Assam Agriculture University and over the years it has developed a variety of foodgrains, pulses and oilseeds to match the specific locations of the state. Specific varieties of the major crops have been developed to sustain the pre- and post- flood situation of the state and the package of practices have been developed accordingly. The Table 3.7 shows the various crop varieties developed in the state by the Assam Agriculture University.

Marketing

The *Haat* and the regulated markets are the two major channels existing in the state for marketing of agricultural produce. The cooperative network is very weak in the state and does not undertake procurement of agricultural produce. The farmers sell their agricultural produce in small quantity through the network of regulated markets in some places. A large volume of foodgrains, oilseeds, cash crops and fruits and vegetables are sold in the state in the rural unorganized markets *(Haat)* held in the villages at regular intervals. The middlemen and private traders largely dominate these markets. There are

1237 rural markets existing in the state, which is the highest number in the Barapeta district. The regulated markets are located in urban areas and are 67 in number with minimum required infrastructure. The district-wise spread of rural and urban markets in the State is exhibited in Table 3.8 which reveals that the representation of regulated markets in the states is very weak as compared to the rural markets. There are some regulated markets in the state that are still functioning under the management of town committees and municipalities, as they have not been transferred to the regulated market committees.

The Assam State Marketing Board has various market promotion programmes for implementation. Of these, creating suitable infrastructure at the market places is one of the prominent activities. The market committees in the state function as per the guidelines formed by the State Marketing Board. The committees function from their respective offices at the principal market yards and check the essential transactions and market management through their staff with the jurisdiction of market committee. The market yards under the market committee are not yet functional in accordance to the Agricultural Produce Marketing Act and the decision on the control process of the markets is pending with the Government of Assam. The principal function of the market committee is collection of Cess and implementation of the provisions of the Act. It has been observed that all regulated market committees have piles of cases pending in the court of law as the provisions of the Act is being challenged time and again by the traders involved in the transaction of notified agricultural commodities.

The rural markets are of traditional nature and many times the farmers are at a disadvantage in striking the bargain due to various economic reasons. Of these, the crop contract binding, indebtedness, need for cash, lack of adequate infrastructure are some of the major reasons of distress sales in the rural markets. However commission agents are found transacting the agricultural produce in the *Haats*. The contract farming in foodgrains, oilseeds and horticultural crops exists in the state in which the traders make advance payments to the farmers at the then prevailing prices and procure the produce from them on harvest.

The market arrivals in the regulated market are less as compared to the arrivals in the open market. The regulated markets do not have an elected body for the last three years and the members nominated by the Government of Assam manage the regulated market committees. The auction of the agricultural produce is conducted on the *Haat* day in the regulated markets in the state. The regulated market committees ensure that the payment of the purchased produce is made on the same day. However, the deferred payments are allowed to be settled within 4 days from the date of transaction. The regulated markets in the state are free from the middlemen as no license is issued to the commission agents to operate therein. All the functions of regulated market committees are performed under the supervision of the agricultural department of the state. Only the notified agricultural produce including the foodgrains, oilseeds, pulses, fibers, spices, fruits and vegetables are permitted for selling in the regulated markets. Among foodgrains, paddy is a market deficit crop and is rarely brought to the market in significant quantity for sales. However, among the horticultural crops tomato has high surplus and is often sold in the market under distress.

The regulated markets in the state possess poor market infrastructure. However, all the market yards have the auction platforms. There are only three cold storages of 5000 MT capacities each available in the state in the private sector and godowns in the regulated markets or *Haats* for use of either farmers or traders. However, in the Government sector Spices Board, Government of India has provided the financial assistance for construction of 1000 MT cold storage in the government sector which will be under the operational control of the state department of agriculture. The regulated market committees have no shops of agricultural inputs inside their premises to facilitate the farmers to buy farm inputs like seeds, fertilizers, pesticides etc. at reasonable prices. It has been found that none of the yards of regulated market have the grading and processing facilities for the food crops, oilseeds, horticultural crops and the like. In absence of market grading the farmers often get a low price for their produce. The price information is made available to the farmers weekly once at the regulated market committees and has very low awareness among the farmers. The market regulating

authorities can provide the market infrastructure by the resources generated by them. It has been observed that the regulated market committees charge 1 percent cess on the market transactions while the Panchayats managing the rural *Haats* charge 10 percent cess from the buyers of farm produce.

Cooperative Marketing

The cooperative movement in Assam dates back to 1904 and has passed through various facets of change over the period and has yet to achieve success in its endeavor. At the end of 1996, there were 754 primary credit societies functioning in the state consisting of 707 Gaon Panchayat Level Sambhai Samitites (GPSS), Large Scale Multipurpose Cooperative Societies (LAMPS). There exist various commodity based non-credit societies, which include marketing, fisheries, dairy and consumer marketing activities. Among various non-credit societies 77 are primary marketing societies. There were 771 primary consumer cooperative societies and 53 wholesale consumer cooperatives during 1996 in the state.

The cooperative network is weak in the state and has insignificant contribution in procurement of agricultural produce, processing and marketing of agricultural inputs. A large number of societies are engaged in public distribution system. The apex cooperative body of the state, state cooperative marketing federation is functionally sick to provide any support to the primary societies. In the allied sector the fish and poultry production are in deficit and the marketing of these products are carried out by the business cartel directly. The state government is gradually making attempts to restore the cooperative system in the state, which has been reflected in conducting the recent elections of the cooperative bodies. It has been found that about 80 percent of the primary agricultural credit societies have the elected representatives in the state. The fish and poultry products imported from other states are better in terms of quality and the market of these products is more organized in terms of price information, customer services, packaging and the like than the local products sold in the markets.

Processing

Processing activities are almost absent in the state. The processing of fruits and vegetables is found in the state in a small quantity in the government sector and relatively higher in the private sector. It has been stated that during 1999-2000 only 52 metric tons of processing activity has been carried out in the government sector while 804 metric tons of fruits have been processed in the private sector. The entrepreneurs in the state have not thought of the quality concept in the processed food products seriously or of better marketing of their product.

The Northeastern Agricultural Marketing Corporation (NERAMAC) with its headquarter at Guwahati has a mandate to develop the processing activities in agriculture and horticulture in the region. However, NERAMAC has not taken-up any processing activities in the state and is also not involved in the procurement of fruits like Pineapple and Oranges for its processing plants located in other states in the region like Tripura. The farmers cultivating fruits and vegetables in the state do not get better price for the produce for various reasons and one of the prominent among these is conventional packaging practice. It has been observed that the farmers use coarse bamboo baskets for collecting the fruits and vegetables and transporting them to the market place. Consequently, over 10 percent of produce suffers from the transit loss by way of physical damage of the produce. The fruits and vegetables are sold in large quantities in the Haats only due to the high transport cost involved in bringing the produce to the regulated markets. The national apex cooperative body, National Agricultural Marketing Cooperative Federation is also dormant in spreading its activities. However, to help the farmers in safe transportation of fruits and vegetables, the Agricultural and Processed Food Export Development Authority (APEDA) has provided a refrigerated van to the state government and is yet to be put into functioning.

It has been observed during the study that some of the rice mills and flourmills in the state are declining and there are no processing activities for the oilseeds. The mustard is cultivated in about 4 Lac hectares in the state and is being procured by the private

traders for the oil millers of other states and after processing and due value addition, the oil is exported to Assam. The customers have to pay nearly double the cost for the mustard oil for not being processed within the state.

Overview

The state government has yet to pay attention towards the promotion of marketing activities and organizing the rural markets. The regulated markets have been found under the stress of litigation with the traders. There are many unsettled court cases filed by the traders of the various notified market areas. The local bodies like Panchayats and municipalities do not take interest in development of markets, as yet these have not yet been transferred to them. The regulated and rural markets have to be provided with the grading and storage facilities. The market information system has to be developed and the access of current market information needs to be provided to the farmers. The absence of processing facility in the state is one of the major reasons for the low market price to all agricultural and horticultural produce in the state.

Tables of Chapter 3

Table 3.1

Distribution of the Number and Area of Operational holding in different classes

Size Class in (Ha)	No. of holding	Percent to Total Land Holdings	Area (in Ha.)	Percent to Total Area under Cultivation
Marginal (Below – 1.0)	1450310	59.95	600365	18.99
Small (1.0 – 2.0)	546456	22.59	76144520	24.09
Semi- Medium (2.0 – 4.0)	324357	13.40	874113	27.65
Medium (4.0 – 10.0)	92338	3.82	480913	15.21
Large (10.0 and above)	5695	0.24	444655	14.06
Total	2419156	100.00	3161498	100.00

Table 3.2

Number of Agricultural Holding and Operated Area as Per Agricultural Census in Assam

ITEM	1970-71	1976-77	1980-81	1985-86	1990-91
1	2	3	4	5	6
1. No. of Holdings	1964376	2253654	2297588	2419156	2523379
2. Total operated area (in thousand hectares)	2882	3079	3121	3161	3205
3. Average size of holdings (in hectares)	1.47	1.37	1.36	1.31	1.27

Table 3.3

Crop-Wise Area and Products

Crop		1997-98		1998-99		1999-2000 (Target)	
		Area	Production	Area	Production	Area	Production
	***A. KHARIF* FOODGRAINS**						
	Autumn Rice	607	597	595	521	500	500
	Winter Rice	1743	2471	1635	2288	1800	2700
	Maize	14	12	15	11	20	14
	PULSES						
	Arahar	7	5	8	5	16	12
	Blackgram	5	3	5	3	7	4
	Greengram	6	4	6	3	8	4
	TOTAL	2382	3092	2264	2831	2851	3234
B)	***RABI FOODGRAINS***						
	Summer Rice	175	314	224	446	300	600
	Other Cereals	10	5	11	5	10	6
	Maize	5	3	5	3	8	6
	Wheat	85	110	90	91	100	130
	PULSES						
	Gram	3	2	3	2	5	4
	Blackgram	40	21	43	22	18	24
	Greengram	9	4	8	3	12	6
	Peas	29	17	27	16	50	32
	Lentil	19	10	25	13	25	14
	Other Pulses	11	6	12	7	15	10
	TOTAL	386	492	448	608	573	832
	TOTAL (A) + (B)	2768	3584	2712	3439	29244	4066
C)	***Kharif* OIL_SEEDS**						
	Sesasum	11	5	11	5	15	8
	Castor	2	1	2	1	2	1
	Soyabean	8	8	2	2	5	5
	Groundnut	2	2	4	5	4	5
	TOTAL	23	16	19	13	26	19
D)	***RABI* OILSEEDS**						
	Rabi & Mustard	279	155	280	136	315	189
	Linseed	10	5	10	5	16	9
	Nizer	10	5	9	4	15	8
	Sesamum	5	3	5	3	8	4
	Soyabean	2	22	1	1	14	20
	Groundnut	13	17	9	11	16	19
	Sunflower			2	2	8	8
	TOTAL	319	187	325	162	292	257
	TOTAL © + (D)	342	203	344	175	418	276
	Jute	95	887	79	687	95	1029
	Mesta	6	29	5	26	6	28
	Sugarcane	31	1287	31	1223	35	1435

Source: (i) Directorate of Economics and Statistics, Assam (ii) Directorate of Agriculture, Assam

Table – 3.4

Comparative Yield Rate of Major Crops in Assam and India

(In Kg. Per Hect.)

Sl. No.	Crops	1995-96		1996-97		1997-98		1998-99	
		Assam	India	Assam	India	Assam	India	Assam	India
1	2	3	4	5	6	7	8	9	10
1.	Rice	1421	1797	1334	1882	1356	1895	1434	NA
2.	Maize	681	1595	679	1720	766	1721	705	NA
3.	Wheat	1107	2483	1332	2679	1299	2470	1010	NA
4.	Gram	507	700	516	813	506	812	500	NA
5.	Tea	1779	1815	NA	1875	NA	NA	NA	NA
6.	Rabi Pulses	523	610	565	747	538	706	536	NA
7.	All Food Grains	NA	1491	NA	1614	NA	1551	1288	NA
8.	Jute	1715	1875	1537	1998	1720	1960	1572	NA
9.	Sugarcane (Cane)	42	68	39	66	41	70	40	NA
10.	Rape and Mustard	514	916	521	1017	553	667	470	NA
11	Potato	7	17	8	19	9	15	8	NA

Source: Directorate of Economics and Statistics, Assam
Economic Survey, 1998-99, Government of India

Table 3.5

Seed Distribution by Assam Seeds Corporation Ltd.

(Quantity in Quintals.)

Sl. No	Crop	1999-2000
1.	Paddy	11900
2.	Wheat	14730
3.	Pulse	3349
4.	Oilseed	1984
5.	Jute	330

Table 3. 5 (A)

Production of Seeds in Assam

(Quantity in Quintals.)

Sl No	Crop	1998-1999	1999-2000
1.	Paddy	26,678	34,243
2.	Mustard	2,845	-

Table 3.5 (B)

Distribution of Fertilizers in the State

(Quantity in Metric Tons)

Year	Nitrogen	Phosphorous	Potassium	Total	Consumption (Ka/Ha)
1998-1999	47690	20556	9856	78102	21.10
1999-2000	60121	28427	21563	110111	29.3 Kg.

Table – 3.6

Irrigation Potential in the State

Year	State Tube Wells Installed	Irrigation Potentiality (in Ha)
1997-1998	5750	11500
1998-1999	11500	20000
1999-2000	115000	104000

Table 3.6 (A)

Status of Agricultural Implements/Machineries in the State

Sl No.	Implements/ Machines	Number
1.	Tractors	1298
2.	Power Tiller	5712
3.	Irrigation Machineries	68378
4.	MB Plough	117530
5.	Paddy Weeder	18759
6.	Dry land Weeder	2054
7.	Small Implements	171013

Table – 3.7

Crop Varieties Practices in Assam

Sl. No	Crop	Varieties
1.	Paddy	
	Sali	Ranjit, Bahadur, Moniram, Peoli, Satya, Basundhara: 120 – 155 days
	Ahu & Post Flood situation	Luit and Kapali : 90 – 95 days Panidra and Padmanath
	Bao *Summer rice*	Jaymati, Bisnu Prasad, Jyati Prasad, Ranjit: 145 – 170 days and non descript varieties collected by the farmers across the border
	Glutineous rice (Bora)	Ranjit, Bhogali : 160 days
	Scented rice (Joha)	Keteki Joha : 160 days
2.	Mustard	TS – 36, TS – 38, 90-95 days
3.	Green Gram	Pratap (S G . 1) : 65 – 75 days

Table – 3.8

Distribution of Markets in the State

Sl.No	Name of the District	No. of Markets	
		Urban	Rural
1.	Dhubri	4	89
2.	Borpeta	5	110
3.	Bongaigaon	3	48
4	Kokrajhar	5	68
5.	Nalbari	3	47
6.	Goalparo	2	51
7.	Kamrup	2	61
8.	Cachar	2	53
9.	N C Hills	2	24
10.	Karbi-Anglong	3	64
11.	N. Lokhimpur	2	22
12.	Sonitpur	3	64
13.	Darrang	3	59
14.	Nagaon	4	103
15.	Morigaon	2	64
16.	Golaghat	4	31
17.	Jorhat	4	33
18.	Sibsagar	2	12
19.	Dibrugarh	2	82
20.	Tinsukia	4	35
21.	Karinganj	2	94
22.	Hailakendi	1	45
23.	Dhemaji	3	14
Total		67	1273

Figure 3.1
Distribution of the Number and Area of Operational Holdings in Different Classes

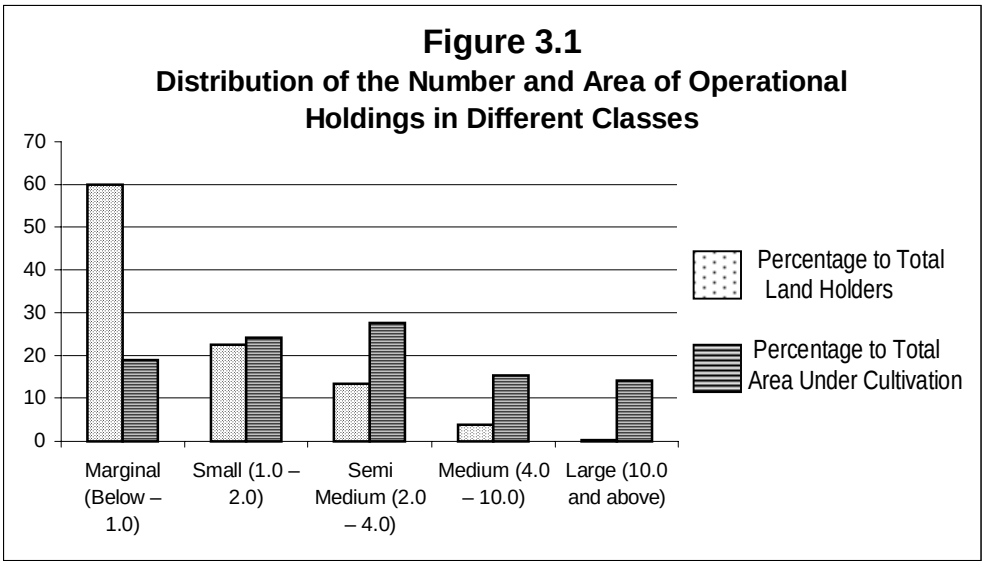
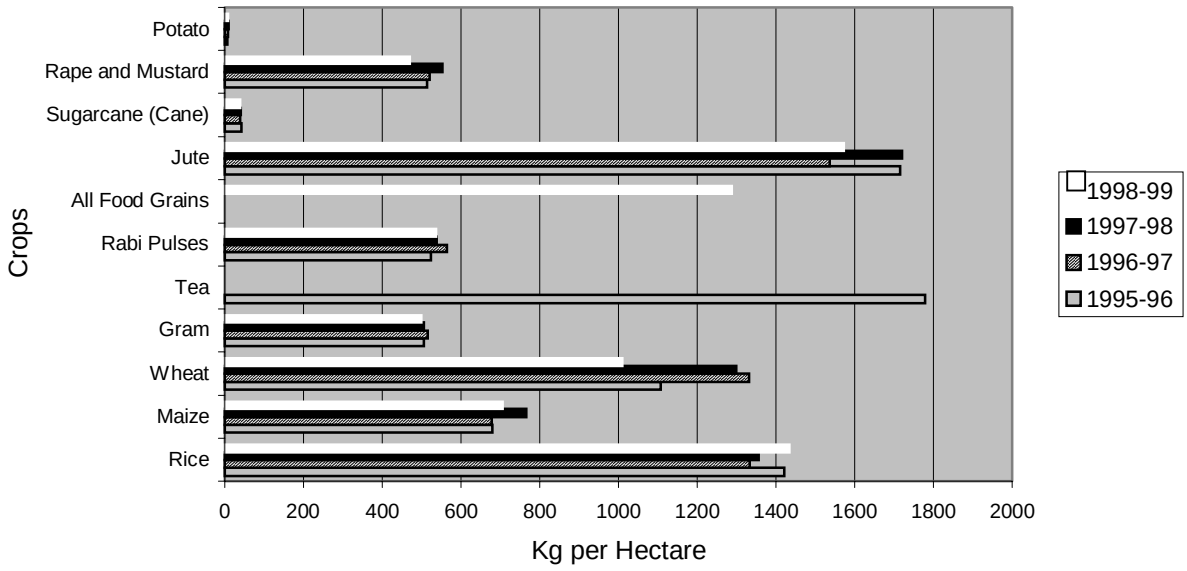


Figure 3.2
Yield Rate of Major Crops in Assam



CHAPTER 4

RURAL MARKETING SYSTEM IN TRIPURA

BACKGROUND

Tripura is a small state in the northeastern region of the country. The terrain of the state is hilly and 70 percent is covered under small hillocks. The state has a large population of tribal community that stays in the hills. The people on hills are nomadic tribes and mostly marginal and sub-marginal farmers and those located on the plains of the state are better placed with the agricultural occupation. The distribution of farmers by the categories of land holding sizes is exhibited in Table 4.1. It may be seen from the data that marginal farmers owning less than 1 hectare land constitute 68.1 percent of the total land holders in the state. The figure 4.1 exhibits the distribution of different categories of land size holdings in the size. The important crops grown in the state are paddy, jute and mesta, cotton, oilseeds like mustard, groundnut, sesame and the major horticultural crops consist of potato, pineapple, orange, jackfruit, cashew nut etc. Spices like ginger and turmeric are also cultivated in the state. Most of the foodgrains are consumed within the state to cater the needs of the local markets while other crops like jute and mesta, cotton, pineapple, orange, jack fruit, ginger and vegetable crops such as cabbage, cauliflower, potato are having considerable quantity of marketable surplus. However, due to lack of proper marketing facilities available in the state the disposal of some of the important produce like jute and Mesta, pineapple, ginger and other vegetable crops is adversely affected.

Agriculture

A large area in the Tripura state is under forest, which occupies 57.77 percent of the total geographical area. Agriculture in the state is largely practiced in a conventional pattern. The major food crop like paddy is cultivated largely in the plains of the state for domestic consumption. The land holdings in the state are largely fragmented and per capita land holding size is 0.97 hectares. The single cropped are in the state is 1.10 Lac hectares out of the net sown area of 2.80 Lac hectares. The intensity of cropping in the state is 173 percent.

Land Use Management

The geographical area of the state is 10.49 Lac hectares of which forest occupies about 57 percent and gross cropped area is accounted for 46.23 percent to the total geographical area. In all, only about 3 Lac hectares is available for the agricultural use. The average size of land holdings in the marginal farmer category (below 1.0 hectares) is found to be 0.40 hectares while in the medium farmers category (4.0 -. 10.hectares) have the 5.14 hectares of land on an average. Agriculture in Tripura is essentially paddy based. The paddy based cropping system in states is shown in Table 4.2, which illustrates the cropping pattern in the rainfed, and irrigated uplands and dry low lands in the state. The area, production and yield of the major agricultural and horticultural crops are shown in Table 4.3. It may be seen that out the total area under different crops, cereals occupy 53.30 percent area while only 1.5 percent area is under the cultivation of oilseeds and nearly equal area is sown under variety of pulses in the state.

Input and Extension Management

All farm inputs such as fertilizers, seeds, plant protection chemicals and the like are procured and distributed through the agriculture department of the state through its own retail outlets at the village level. Unlike other states the department of agriculture of the state manages the entire responsibility of input supply. The state government

implements a large number of programmes on plot demonstrations, training and visits to generate awareness about the improved package of practices among the farmers. The agriculture department under specific extension programmes also distributes the minikits, planting materials, HYV seeds. The production technology is also provided to the farmers from time to time on major crops through the national level institutions during the specially planned occasions. There are no post-harvest technology programmes in the state for cereals, pulses, oilseeds and commercial crops. However, some training programmes have been organized on the post-harvest technology for the fruit crops during 1999-2000.

Agricultural Marketing

There are total 555 rural and 30 urban markets in the state. All these markets have been provided with minimum required market infrastructure such as market sheds, yards, link roads through implementing a scheme of development of markets and marketing facilities. Of the above markets about 237 rural and 10 urban markets are located in the south district of the state. However, the accessibility to these markets is limited and in all, 53 percent of markets are accessible in all weather by road. The Table 4.4 shows the network of rural and urban markets in the districts and their status of accessibility. The ninth plan of the state further envisages the scope for similar programmes for the promotion of agricultural markets. The graphic presentation of the rural and urban markets in various distracts in the state is exhibited in figure 4.2. The Table 4.5, figure 4.3 exhibits the distribution of various categories of markets in the state by various agricultural divisions.

The department of agriculture of the state government is undertaking currently the development activities of 21 regulated markets in the state. As regards the management of primary markets and *Haats* the subject has been transferred to the respective Panchayats. The overall development of these markets within the territory of Autonomous District Council rests with the Tripura Tribal Areas Autonomous District

Council. However, the State Agricultural Marketing Boards have become defunct after the expiry of its five-year tenure of the nominated members since 1993. The Board could not be elected, as the election of the market committees of the regulated market could not be held subsequently. Consequently the constitution of the Board and market committees could not be made and the problems of empowering the managing committees for day to day functioning could not be sorted out in the state. All the 12 regulated market are being managed in the state currently through the nominated committees under the supervision of Superintendent of Agriculture of the state department of agriculture. It has been observed that 10 regulated markets are located within the jurisdiction of the Tripura Tribal Areas Autonomous District Council. The Council has formed the legislation of regulated markets but the state government has not yet handed over the market to the Council. Different authorities of the state are controlling the rural markets and the regulated markets in the state. In view of the above control setup for the markets in the state, development works and proper market planning could not be done systematically.

The infrastructure facilities for agricultural marketing in the state are very limited. In all, 45 percent of the rural markets in the state have been provided with minimum infrastructure facilities like market shed, platform for sales of farm produce, sanitation etc. in phased manner since the inception of the Sixth Five Year Plan under the state plan. There has been non-financial support either from the financial institutions or a government of India towards the development of markets in the state and the market development activity is being undertaken solely on the state plan. The department of agriculture of the state is facing resources problems as only 2-3 markets in a financial year can be taken up for developing the marketing facilities within the budget allocated for market development in the state. The market development budget allocates Rs. 30 Lac on an average per year. It has been observed that the revenue collected in terms of market cess by various organizations like village panchayats, municipal councils (7) and Nyaya panchayats (12) at the sub-divisions is not transferred to the agriculture department of the state in order to supplement to the resource allocation.

It has been found during the study that there are no primary or secondary grading faciities available in the market yards in the state. The food grading certification of AGMARK of the Government of India is also not available in the state for any semi-processed and processed food products. The storage capacity available in the state is for 1.33 Lac MT under various organizations. The Food and Civil Supplies Department of the state owns the largest capacity of storage in the state that accounts for 28.72 percent to the total available capacity in the state. The Central Warehouse Corporation (CWC) provides 17.28 percent capacity of the storage facilities to the total while the storage capacity in the cooperative sector and agriculture department accounts for 18.41 and 20.45 percent respectively to the total of the state. The Table 4.6 exhibits the states storage capacity available in various organizations. All these organizations are having general type of storage facilities with them.

There is only 5000 MT cold storage available in the state owned by CWC, Tripura Apex Cooperative Marketing Society (TAMCS) and private sector. The TAMCS and private sector own 40 percent each of the total available capacity of the cold storage in the state while 20 percent capacity accounts for the CWC in the state. The storage available with the government departments is generally not provided for the farmers' use. The cold storage charge for Potatoes is Rs 85 per quintal per season. The transportation of agricultural and horticultural commodities to the rural and urban markets is mainly done by surface transport operated by the private agencies. The cost of transport is as high as Rs. 1.00 per quintal per kilometer and the farmers experience 15-18 percent of transit loss in the fruits and vegetables transport due to bad condition of roads and poor transport facilities. There is no scientific packaging of agricultural and horticultural produce is available in the state and almost all farmers practice conventional packaging for their produce.

Among various commodities, paddy, rice, oilseeds, cotton, jute and mesta, fruits and vegetables, spices and condiments are the main commodities transacted in the rural and urban markets spread over the state. It has been observed that on an average in

the Agartala market 10 quintals of rice are marketed per day. There exist direct transactions between the producer and the buyer in most of the rural markets or *Haats*. The middlemen and wholesalers are also involved in the transactions often in the agricultural produce marketing. It has been observed that the traders send their agents to procure the produce from the village and farmers also feel convenient to dispose off their produce there itself due to the logistics problems. The prices were found to be 25-30 percent lesser in the villages as compared to the market in the Agartala. The traders also advance money to the farmers during the cropping season and procure the produce from them towards adjustment of debt. The contract farming is noticed in case of fruit crops like oranges and pineapple in the state. The market fee charged in the regulated markets is Rs. 2 per entity basis except for the animals brought to the market for sale. The cess for the animal exchanges ranges between Rs. 3-6 per animal.

Horticulture Produce Marketing and Processing

It has been observed that the supply and demand equilibrium for the horticulture produce in the state is unequal. The supply of fruit crops like jackfruit, banana, pineapple etc. is more than the demand, which pulls down the price. The market intake of these crops is also affected due to inadequate storage and transport facilities available in the state. Such bottlenecks are also attributed to the distress sales of horticulture produce in the post harvest season. To check such distress sales and protect the farmers' interest the support price is fixed by the state government and Tripura Horticulture Corporation and Tripura State Industrial Development Corporation are assigned the task of procuring the horticultural produce. West district of the state is adjacent to Bangladesh, The farmers find it most profitable to arrange transporting their horticulture produce across the border in order to fetch better price. The South district of the state is also close to the west district, which is one of the major producing districts of the horticultural crops. In all, the trade across the border is more channelized than the domestic markets. However, there are export organizations dealing with the international consignments of the fruits and vegetables. The farmers, who do not have access to the international borders trade, depend on traders who lift the produce first to

the Karimganj for subsequent dispatch to other terminal markets. Largely the private traders also aim primarily at selling the produce in the Bangladesh market.

Cooperative Marketing

The Cooperative Societies are voluntary and democratic organization based on equity, fraternity and common interest. These organizations are formed by common people with a view to liberate themselves from the exploitation of stranger groups. There are as many as 1500 cooperative societies in Tripura during 1998-99 engaged in different activities. In tribal areas of the district there are 56 LAMPS, which are functioning, for the interest of tribal people and in plain land 213 Primary Agricultural Credit Societies and Farmers Service Societies have been formed mostly with the SC & OBC members to fulfill their objectives. Besides, there are 14 Primary Marketing Co-operative Societies, which are actively participating in market of agricultural & consumers' goods in rural areas.

Due to paucity of resources with the state government the cooperative movement could not be thrived at the desired level. Yet the cooperative societies in the state are playing a vital role to hold the price line including the service to the common people by supplying essential commodities at a reasonable price. The Tripura State Cooperative Consumers Federation Limited, the Tripura Apex Marketing Cooperative Society Limited, Tripura Apex Weavers Coop. Society Limited, Tripura Fishery Cooperative Society Limited, and Tripura Milk Union Ltd are engaged in marketing agricultural commodities like potato/*jhum* seeds/paddy/other vegetable/jute etc/textiles including wholesale business of S.K Oil/ medicine, etc. The primary societies have their linkage with Statefeds in procurement of agricultural produces, *Jhum* seeds, Jute and Mesta and Minor forest produces also in dealing with consumer goods. The primary societies are directly linked with the producer while for procurement of those commodities and act as an agent of State.

As far as Primary Societies are concerned, they have infrastructural facilities available with them. They have their own storage facilities. There are 213 go-downs owned by the different cooperative societies including a cold storage owned by TAMCs Limited. They purchase agricultural commodities, minor forest produces, etc., from the producers and sell out these to the societies, which in turn store these commodities in their own godowns. Thereafter the Statefeds lift these from the societies by their own arrangement and the primary societies get a small margin.

Overview

Rural and regulated markets exist in the state and different authorities manage them. The infrastructure facilities in the rural market are poor and the private traders are largely operating in the state in procuring the agricultural produce. The processing of fruits and vegetables in the state is not encouraging however; the North Eastern Agricultural Marketing Corporation (NERAMAC) and private entrepreneurs manage a few pineapple concentrate units. The intake of the fruits and vegetables in the processing sector is very marginal and there prevail problems of marketing of the processed product. The cooperative network in the state is weak and agricultural produce is not procured by the cooperatives and so has not emerged as alternative channel for the farmers to market their farm produce.

Statistical Tables of Chapter 4

Table-4.1

Distribution of Land Holdings

(In Hectares)

Size	Class of Holding	Total Nos. of operation holding	Average size of holding.	Percentage of land holding
1	Marginal (below 1 ha.)	216826	0.40	68.1
2	Small (1.0 - 2.0 ha.)	69217	1.53	21.7
3	Semi- Medium (2.0 - 4.0 ha.)	28432	2.69	8.9
4.	Medium (4.0 - 10.0 ha.)	3571	5.14	1.1
5.	Large (10.0 - Above)	166	12.57	0.2
Overall		318212	0.97	100

Table 4.2

Cropping Pattern Practiced in the State

Eco System	March April - June July		July August - Oct. Nov		Nov. Dec. - Feb. Mar	
	1st Crop	Sowing time	2nd Crop	Sowing Time	3rd Crop	Sowing Time
Rainfed upland	Rice(local)	April	Red Gram	July	-	-
	Maize	April	-	-	-	-
	Kharif Pusles	April	-	-	-	-
Irrigated upland	HYV rice	April	HYV Paddy	July	Potato	Nov.
					Winter	Nov.
					Vegt. Wheat	Dec.
					Rabi. Pulses	Nov.
					HYV Paddy	Dec.
Irrigated Low Land	-	-	HYV Paddy	July	HYV Paddy	Dec.
			Hybrid Paddy	July	Hybrid Paddy	Dec.

Table 4.3

Area, Production & Yield of Different Agricultural and Horticultural Crops (1998-99)

Name of Crops	1998- 99			
	Area in Hectares	Production in M.T	Yield in Kg/Hect	Remarks
Rice	255487	491430	1923	
Maize	2320	1730	746	
Wheat	1110	2100	1892	
Total Cereals	**258917**	**495260**	**1913**	
Kharif Pulses	4050	2420	597	
Rabi Pulses	3400	1790	526	
Total Foodgrains	**266367**	**499470**	**1875**	
Kharif Oilseed	3590	2340	652	
Rabi Oilseed	3995	3215	805	
Total Oilseed	**7585**	**5555**	**732**	
Jute	1260	10,000(B)	7.94	
Mesta	2175	15250(B)	7.01	(B) Bales of 180 kgs
Cotton	750	850(B)*	1.13	(B)* Bales of 170 kgs
Sugarcane	1080	51300	47.50	
Total Commercial Crops	**5265**	**77400**	**14.70**	
Plantation and Horticultural Crops				
Coconut	9084	* 75457	-	(*) in Lakh Nos
Areca nut	2336	4192	1794	
Cashew nut	6739	1900	282	
Potato	5120	88000	17187	
Ginger	1200	2400	2000	
Sweet potato	1000	9000	9000	
Onion	125	195	1560	
Banana	4065	27700	6814	
Chillies	2000	1200	600	
Turmeric	1500	2800	1867	
Papaya	520	2803	5390	
Litchi	4673	26620	5696	
Mango	5030	23145	4600	
Pineapple	4297	36460	8485	
Orange	5267	25240	4792	
Jack fruit	8429	221450	26272	
Lemon	3240	32380	9994	
Tapiaca	500	2250	4500	
Tobacco	300	110	375	
Vegetables	45000	225500	5000	
Tea	6062	-	-	
Rubber	21000	-	-	
Other Agricultural and Fruit Crops	67296	-	-	
Total	**4,84,000**			

Table 4.4

Network of Rural and Urban Markets

(Number of Makets)

Type of Market	Districts				**Total**
	North District	Dhalai District	West District	South District	
Rural	109	45	164	237	**555**
Urban	5	4	11	10	**30**
Accessible	27	12	137	134	**310**

Table 4.5

Distribution of Bi-Weekly, Weekly Rural Markets & Regulated Markets in the State

Sl.No.	Name of Agriculture Sub-Division	Category of Market				Total
		Daily	Bi-Weekly	Regulated	Weekly	
1.	Panisagar (North)	5	14	1	20	40
2.	Kanchanpur(North)	1	11	1	11	24
3.	Kumarghat (North) (Pabiacherra)		20	1	24	45
4.	Chowmanu (Dhalai)	1	12	1	4	18
5.	Salema (Dhalai)	3	9	1	6	19
6.	Gandacherra (Dhalai)	-	-	1	7	8
7.	Teliamur (West)	-	15	1	18	34
8.	Khowai (West)	2	7	1	23	33
9.	Jirania (West)	1	4	1	14	20
10.	Mohanpur (West)	2	12	1	26	41
11.	Bishalgarh (West)	6	11	3	45	65
12.	Melaghar (West)	6	8	2	28	44
13.	Materbari (South)	1	9	1	29	40
14.	Amarpur (South)	3	3	1	15	22
15.	Bagafa (South)	-	9	2	24	35
16.	Rajnagar (South)	-	16	1	17	34
17.	Satchand (South)	2	14	1	16	33
Total		**44**	**160**	**24**	**327.**	**555**

Table 4.6

Storage Capacity Available in the State

Controlling Authority	Capacity in M.T.	Percentage of Total Capacity	General Storage Type
Central Warehousing Corporation	23,000	17.28	General storage type
Co-op. Society	24,500	18.41	General storage type
Food & Civil Supplies Dept.	38,208	28.72	General storage type
Food Corporation of India	20,140	15.14	General storage type
Agriculture Department	27,200	20.45	General storage type
Total Storage Capacity	1,33,048 M.T	100	
Cold Storage			
Central Warehousing Corporation	1000 M.T	20	
Tripura Apex Marketing . Co-operative Society	2000 M.T.	40	
Private Sector	2000 M.T.	40	
Total Cold Storage Capacity	5000 M.T	100	

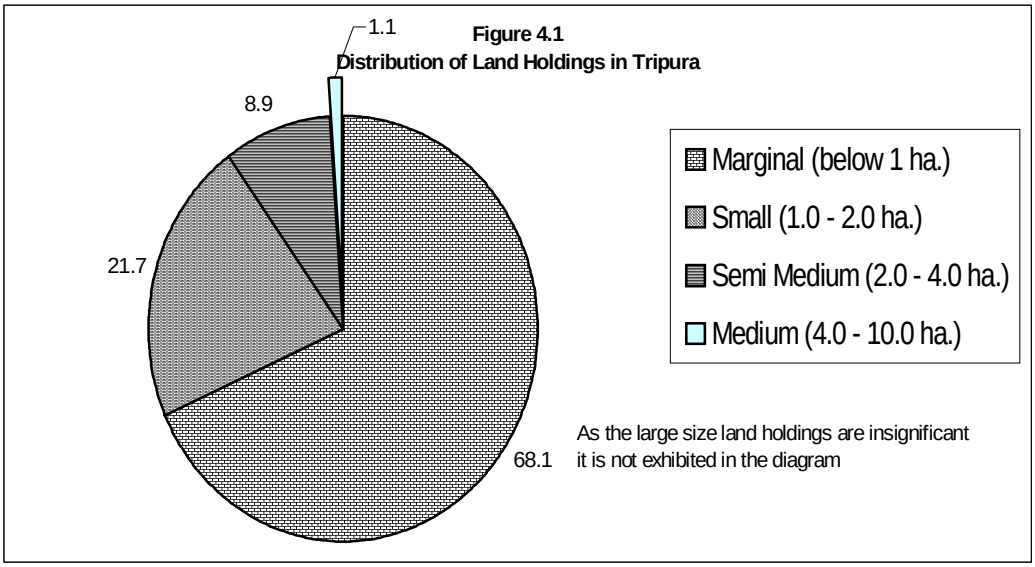
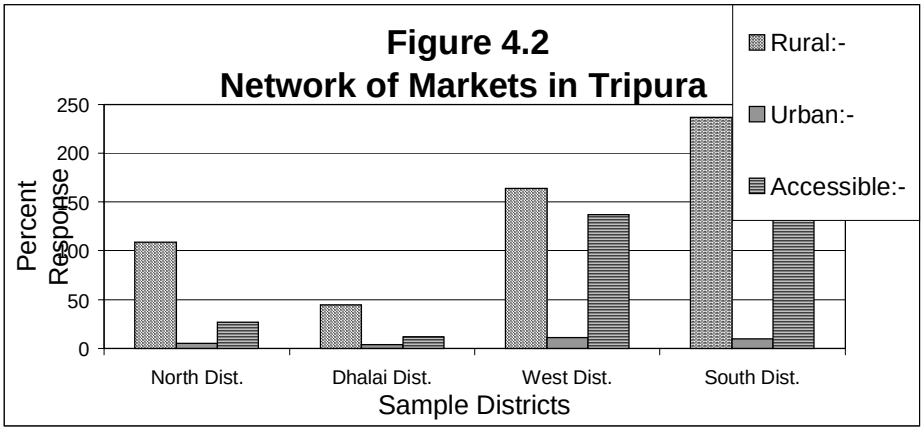
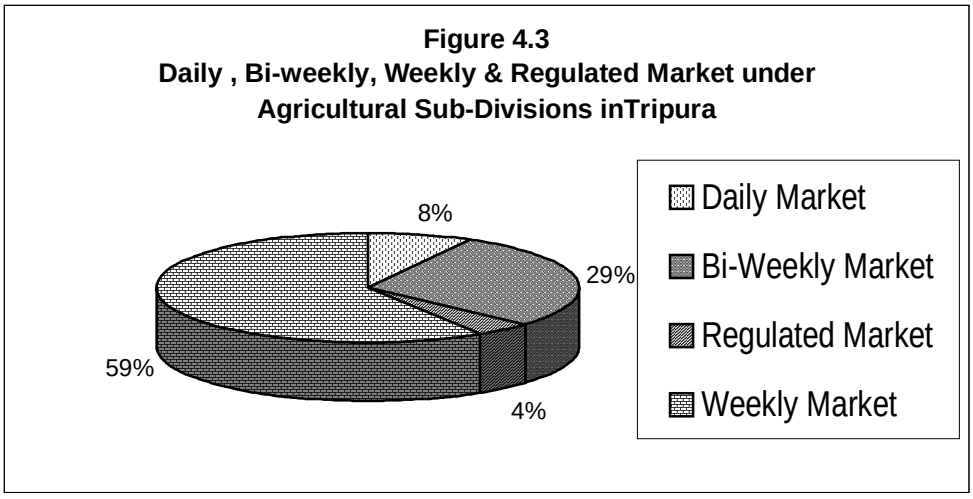


Figure 4.1
Distribution of Land Holdings in Tripura





CHAPTER 5

AGRICULTURAL AND RURAL MARKETING IN MEGHALAYA

Introduction

Barely 10% of the total geographical area of 22,40,900 hectares reported for land utilization statistics is available for crop husbandry in Meghalaya while the availability of cultivable land as percentage of total area for the nation as a whole is a little over 55%. Just around 10% of cultivated area has access to any kind of irrigation which is again far below the national average of 37% and lesser than even the average for the North-Eastern region.

Yet, nearly 70% of the state's active workforce of 8,53,622 main workers out of a total population of 22 lakhs depended directly or indirectly on agriculture for their livelihood in 1997-1998 (Source: Statistical Handbook for Meghalaya-1998). Another 15% of main workers depend on other rural economic activities. Besides employment, agriculture and allied activities contributed at 1995-'96 prices to a quarter of the Net State Domestic Product of Meghalaya.

It is in this scenario where serious constraints exist to both expanding cultivable area as well as intensive cropping, coupled with the problems relating to geographical nature of the entire region and inadequate infrastructure, that marketing of agricultural and horticultural produce assumes critical importance for the economy of Meghalaya. Not only would the limited resource have to be exploited consciously for high value cropping but the system of marketing should support fullest realization of the value and more importantly its fair share to all the stakeholders. The same logic would also extend to other rural products like honey, bamboo articles, leather goods etc.

Land Utilization

As already mentioned, the land utilized for cropping in Meghalaya is just a tenth of the state's geographical area, half of which is either under forest cover or simply not fit for cropping. The distribution of the cultivable land between the seven revenue districts of the states is also quite skewed as may be seen from Table 5.1.

Obviously, the Garo Hills region has larger availability of land for cultivation relative to the total land area with West Garo Hills district topping the table in terms of net as well as gross cropped area. The lowest cultivability of land is in the West Khasi Hills district, which accounts for nearly 24% of the State's geographical area but only 4.16% of that is sown in net terms. The cultivable area from remaining five districts reflects the state's average. As a corollary to the above land utilization pattern, the land holdings tend to be very fragmented with the gross irrigated area per cultivator in 1994-'95 working out to 0.10 hectare against the national average of 0.60 hectare in the same year.

Cropping Pattern

As can be seen from Table 5.2, the cropping pattern in Meghalaya is quite interesting with a variety of both agricultural and horticultural crops grown throughout the state, despite its difficult geography.

Such diversity in the crop-mix should strategically be viewed as a positive element in the economy of Northeastern states since their markets do not easily converge with the mainstream markets of India on account of poor infrastructure and flow of information. However, the cropping pattern, which in the last five years between 1993-'94 and 1998-'99 has remained stagnant except for marginal increase in acreage under horticultural crops, should be a matter of concern. The current study does not focus on the management of agricultural production and the inputs to the same, but it needs to be pointed out that considerable improvement has been recorded in the yield rates of major

crops grown in the state, and scope exists for further growth in productivity to rise to the national average.

The few crops where the acreage has shown growth in recent years is pineapple, Areca nut, Ginger and Potato and interestingly, the cultivation of these crops is concentrated in select districts. Intensive rather than scattered distribution of specific crop acreages lends itself to better post-harvest value addition through processing which is to be seen as another positive feature for the peculiarities that the region presents for planned development of rural marketing systems.

For instance, out of an area of 20,753 acres under Potato in the state (Table 5.2), almost 20,000 acres is concentrated in the two districts of East and West Khasi Hills. Similarly, the East and West Garo Hills districts share between them, over two-third of the state's acreage under Ginger crop. Again, Ri-bhoi and West Garo districts account for 60% of the acreage under pineapple. The East Khasi Hills district alone has around 50% of the areca nut area in the state. This pattern of cropping should form the basis for future initiatives to develop agricultural marketing infrastructure in the state.

Agricultural Marketing System

Despite having a varied crop-mix within Meghalaya, the fact remains that the cropping pattern across the Northeastern region tends to be similar, leaving the state with a marketable surplus particularly of commercial and horticultural crops. There are 108 market centres in Meghalaya on record, variously managed by the Municipalities, Autonomous District Councils, Co-operatives and the Meghalaya State Agricultural Marketing Board (MSAMB) of which only two are wholesale markets regulated by the MSAMB under the 'Meghalaya Agricultural Produce Market Act', 1980. The district-wise break-up of the agricultural markets may be seen from Table 5.3 and Figure 5.2.

But for the two wholesale market yards, one each at Mawlong in the East Khasi Hills district and at Garobadha in the West Garo Hills district, which are not yet fully operational, almost the entire marketing system is unorganized in the form of traditional *'Haats* and weekly *bazars'*. This renders the job of determining the commodity-wise and district-wise marketable surplus very difficult. The situation is further compounded by the fact that a chain of middle-men operate as transporters and traders between the farm-gate and the markets within the state as well as outside including the markets in neighboring Bangladesh.

Post Harvest Support Systems

Basic infrastructure, hard and soft, for post harvest management of agricultural and the more perishable horticultural produce is grossly inadequate which leaves the producers without any bargaining power at the marketplace. There is no cold storage facility in the state, either in the private or public/co-operative sectors despite the fact that perishable commodities like Pineapple, Oranges, Banana, Potato, and other seasonal vegetables are grown as mentioned earlier. The farmers generally store their produce temporarily in bulk or in bags at home in *kutccha* godowns or in underground circular pits. Matting prepared from straw bamboo strip or other suitable materials is used to protect against moisture and damage. No information was available on the actual losses suffered by farmers due to lack of scientific storage facilities and awareness on the part of farmers, but it would certainly be well above the national average.

Government supported organizations like State and Central Warehousing Corporations, Meghalaya Apex Co-operative Federation, Food Corporation of India, MSAMB and others have constructed few godowns but these storage facilities are utilized fully by the respective organizations for their own businesses or for other institutional customers. For instance, the State Warehousing Corporation and the MSAMB own 11,000 and 5,000 metric tons of storage capacity but the same is hardly available to individual farmers and even if made available, the rental charges of Rs. 2.00 per square foot per month is felt unaffordable by the farmers.

It is expected that the two wholesale market yards at Mawlong and Garobadha would soon commission their cold storage units of 1000 metric tons each and also other storage, resting, parking, sanitation, water supply, banking, grading and auction platforms for farmers and traders. This backed with adequate soft measures like publicity, extension and training of both farmers and MSAMB staff in grading and handling should help attract larger arrivals of farm produce and yield better returns to the producers.

Transportation and transit losses are another major burden on the farmers in view of the difficult terrain and *kutccha* roads. The produce is generally brought from the farm or home to the roadside by head load in bamboo baskets or in gunny bags. Later the produce is repacked either in bigger bamboo baskets or gunny bags each weighing 50-60 kilograms and in the process of handling, items like tomato, orange, pineapple etc. suffer heavy losses in quality and weight. This can be reduced to a great extent if the farmers are encouraged to use plastic crates for packing. Since speedy movement of perishables to markets is important, private transporters charge the farmers exorbitantly. To help the farmers in this regard, the MSAMB is operating two mini-trucks for transporting farmers' produce from farm to market at nominal prices.

Agro and Horticultural Processing

Disposal of the entire perishable horticultural produce in terminal markets in raw form may not always be possible because of the distance, transport costs, transit damage and stiff market competition. Therefore, a two fold strategy for setting up centrally located, economically viable and commercially managed multi-product horticultural Processing units as well as product-specific, low cost, producer managed processing units for the utilization of the surplus produce needs to be tested after more detailed studies. The State currently owns two Fruit Processing Units of 60 & 40 metric tons

capacity each managed departmentally but they have become uneconomical to operate for very obvious reasons.

Scope also exists for setting up other agro-processing industries based on commodities such as ginger, potato, mushrooms, jack-fruit, tapioca, banana, cashew nut, Pine-apple etc. but attracting private investment has been extremely difficult due to the prevailing social and ethnic tensions in the region. Availability of suitable packaging materials for the fresh and processed produce being a problem, it can be seen as an opportunity for eco-friendly packaging units utilizing locally available raw materials to come up in the state.

Institutional Support Systems

As far as the marketing of agricultural and other rural products are concerned, there is no appreciable contribution made by the institutional system in the state. Awareness of various schemes operated by Government of India bodies like the National Horticultural Board (NHB), Agricultural Products Export Development Authority (APEDA), National Co-operative Development Corporation (NCDC), National Agricultural Co-operative Marketing Federation (NAFED) and others is very limited among farmers and even officials of the concerned wings of the State Government.

Among the state level institutions, only the MSAMB is active in extending marketing support to the farmers through the initiatives already discussed. A network of 179 Primary Agricultural Co-operative Credit Societies are registered toward the end of 1996-'97 in the state with a total membership of 1,35, 278 (Source; Statistical Handbook of Meghalaya, 1998) but their activities are mostly focused on the disbursement and recovery of agricultural production credit. On the non-credit front, the Primary Co-operatives find it more convenient to handle agricultural inputs and Fair Price Commodities under the Public Distribution System rather than agricultural output due to the inherent risks involved with the latter activity.

Since the apex Co-operative Federation in Meghalaya (MECOFED) has also not been very visible in providing market support to rural producers, it only appears logical that the MSAMB should take on the nodal institutional role to develop horizontal linkages among the Primary Co-operatives and the unorganized rural markets on one hand and vertical linkages upwards to tap in to the assistance from Central institutions. It is also necessary that phased action is initiated to develop and entrust the responsibility for managing the institutional marketing support systems to the elected bodies while the State Government should intervene only with base financial, policy and information support.

Export Promotion

Cross border trade between farmers and traders of Meghalaya and neighboring Bangladesh is fairly vigorous though official figures data cannot be compiled. This has its roots in the pre-independent free trade that the people of the State used to have with the markets in East Bengal (now Bangladesh). However, after the partition, closure of border *haats* and *bazaars* on either side of the borders has affected the volume of trade but old trading relationships continue to operate. In view of the South Asian Free Trade Area (SAFTA) becoming a reality soon, and the demand for citrus fruits mainly oranges, banana, pineapple, *tezpatta*, areca nut, betel leaf, jackfruit and other products from Meghalaya in Bangladesh where competition from other South Asian exporters would be imminent, the Government of Meghalaya should create a separate export arm in the MSAMB as a preparatory measure.

Statistical Tables of Chapter 5

Table 5.1

District-wise Cropped Area in Meghalaya (Area in hectares/1997-'98)

Sl. No.	District Name	Reporting Geographi-cal Area	Net Area Sown	(D) as %age of (C)	Area Repeat Sown	Total Cropped Area
(A)	(B)	(C)	(D)	(E)	(F)	(G)
1.	Ri- Bhoi	2, 37, 800	21, 325	09.00	1508	22, 833
2.	East Khasi Hills	2, 75, 200	31, 738	11.50	7753	39, 491
3.	West Khasi Hills	5, 30, 100	22, 058	04.16	4990	27, 048
4.	Jaintia Hills	3, 81, 100	33, 047	08.67	0315	33, 362
5.	East Garo Hills	2, 60, 300	28, 900	11.10	5226	34, 126
6.	West Garo Hills	3, 71, 400	65, 364	17.60	19,931	85, 295
7.	South Garo Hills	1, 85, 000	18, 789	10.16	4722	23, 511
	State Total	22, 40, 900	2, 21, 221	09.87	49, 145	2,70, 366

Source; Statistical Handbook of Meghalaya, 1998.

Table 5.2

Crop-wise Area, Production and Yields in Meghalaya

S no	Crops	1993-'94			1998-'99		
		Area in hectares	Production-metric tons	Yield-K.g / hectare	Area in hectares	Produc-tion-metric tons	Yield-Kg / Hectare
1.	Rice	104,408	117,786	1,128	105,402	149,734	1421
2.	Wheat	4,214	6,636	-	4,287	6998	1632
3.	Maize	16, 973	2,00,86	1,183	17, 219	25,272	1468
4.	Other Cereals	2,971	2423	-	2, 823	2282	808
5.	Pulses	3,201	2403	-	3, 262	2488	763
6.	All Foodgrains	131,767	148,334	-	132,994	186,774	1404
7.	Oilseeds	8, 101	4714	595	9,219	6120	664
8.	Jute	4,336	3,34,55	1,388	4,241	27,097	1150
9.	Mesta	4,753	21,826	-	4,681	21,422	824
10.	Cotton	7,515	5380	-	7,549	5599	126
11.	S.cane	85	229	-	83	225	2711
12.	Chillies	1,739	1073	-	1, 764	1051	596
13.	Tobacco	760	525	-	742	507	683
14.	Turmeric	1,348	1784	-	1, 375	6997	5089
15.	Arecanut	8,771	8440	-	9, 585	11,567	1207
16.	Potato	17,689	118,138	6,678	20,753	201,059	9688
17.	Sweet Potato	5,280	17,324	-	5,181	17,291	3337
18.	Tapioca	4, 046	22,138	-	3, 963	21,251	5362
19.	Soyabean	918	876	-	899	812	903
	Cash Crops			-			
20.	Ginger	6, 670	41,837	-	7, 403	45,590	6158
21.	Pine Apple	8,205	66,259	-	9,291	80,116	8625
22.	Citrus	7, 206	34,220	-	7, 523	35,205	4680
23.	Banana	4,959	62,643	-	5, 194	62,888	12,108
24.	Papaya	456	3757	-	495	3997	3997
25.	Horticulture			-		176,752	
	Total			-			

Table 5.3

District-wise Market centres in Meghalaya

Sl.No.	District	No. of Markets
1.	Ri- Bhoi	08
2.	East Khasi Hills	15*
3.	West Khasi Hills	12
4.	Jaintia Hills	23
5.	East Garo Hills	20
6.	West Garo Hills	31*
7.	South Garo Hills	Nil
	State Total	109

* Includes the wholesale regulated Market of MSAMB

Figure 5.1A
Area of Major Crops in Meghalaya

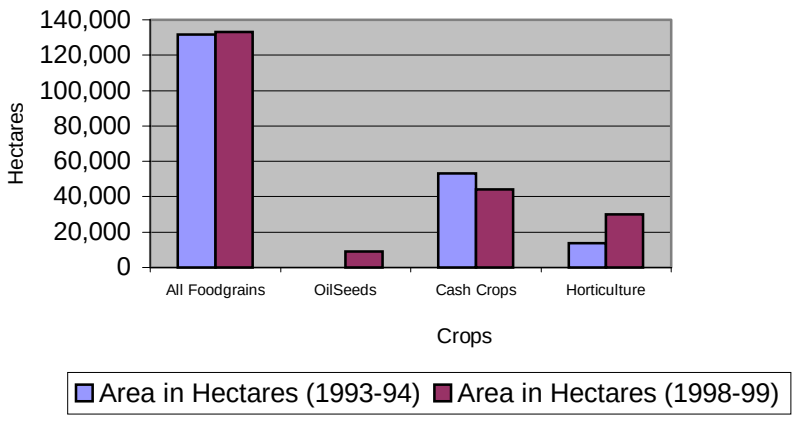


Figure 5.1B
Production of Major Crops in Meghalaya

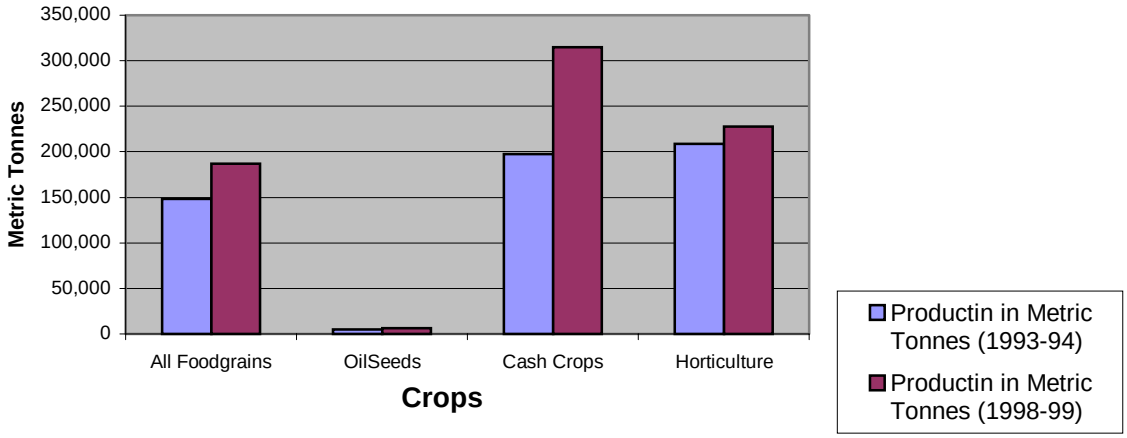
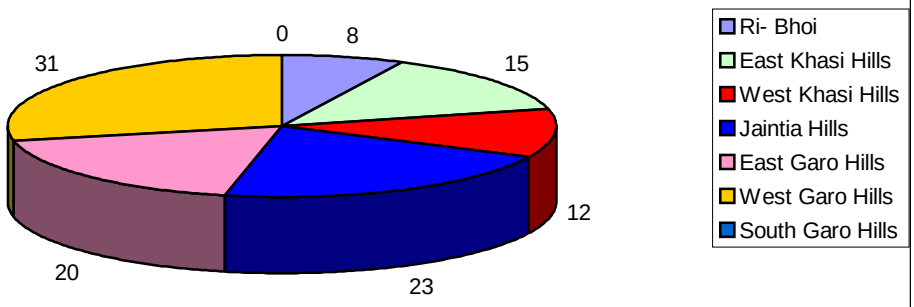


Figure 5.2
District-Wise Market Centres in Meghalaya



CHAPTER 6

PERCEPTIONS OF FARMERS ON RURAL MARKETING

The economy of the northeastern states is largely agriculture based and with a small percentage of population engaged in the non-farm activities like handlooms, handicrafts, rural industries, services and business. The marketing of farm produce and non-farm products is largely unorganized in the region. However, efforts of institutionalizing the agricultural marketing activity in the states of Assam, Meghalaya, Tripura, Manipur and other states in the region have been made continuously by the respective governments of the states. The private trade channels in the agricultural produce marketing and the non-farm sector products marketing are predominant in the region in general and the selected states for the study in particular. The institutional interventions are made in the marketing of agricultural produce through the regulated markets, cooperative organizations and processing activities managed under the government and public sector undertakings.

Profile of Respondents

The practices of agricultural marketing in the selected states in all the existing marketing channels have been discussed in the previous chapters in reference to each state. The following discussion presents the perceptions of the farmers and non-farm sector entrepreneurs on the marketing of their products in rural and urban markets channel performance and problems thereof. The analysis on the key indicators have been based on the primary data collected from 142 respondents in the spread over Assam (71), Meghalaya (24) and Tripura (47) states. The respondents are of mixed nature who have both farm and non-farm activities and had experienced the marketing of their farm produce and non-farm products. The Table 6.1 shows the occupational distribution of sample respondents in the selected districts of the above states. The data reveals that

all the sample respondents had agriculture as primary occupation however, 71.83 percent of them were also engaged in cottage industry preparing various handicrafts items to supplement their farm income. Of the total respondents 28,17 percent were engaged in the services and business activities in the village and its surroundings. It has been found that most of the respondents were had land holding size of less than 2.5 acres. The respondents included also the nomadic tribes practicing *Jhum* cultivation.

Land and Economy

The Table 6.2 exhibits the land use pattern of the respondents. The data shows that 83.2 percent respondents had owned land up to 2.5 acres and only 16.2 percent of the respondents were holding land size between 2.6 to 5.0 acres in the selected districts. It has been found that as many as 83.1 percent respondents had dry land for cultivation. The respondents were found in the four annual income categories as shown in the Table 6.3. The data shows that the maximum respondents (43.66 percent) had annual income between Rs. 15-30 thousands derived from their primary and secondary occupations. It has been observed that the respondents were supplementing their farm income by the handicrafts products marketing to the extent of 40 percent to their total income. Hence about 30 percent of the respondents were found having annual income in the range of Rs. 30-45 thousand on an average.

Agriculture

It has been observed that the cropping practices of the sample respondents in the selected region dominated the cultivation of cereals, cash crop like cotton, fruits and vegetables and spices. The Table 6.4 details the cropping pattern observed by the sample respondents. It may be seen from the data that a large number of farmers cultivate spices in Kamrup and East Garo districts of Assam and Meghalaya respectively. The fruits and vegetables are cultivated in all the districts and treated as a ready cash crop. Vegetables are also exported to the cross border countries and

domestic destinations like Calcutta. Majority of farmers get good production of cereals, fruits and vegetables in all the sample districts of the selected states. The Tables 6.5 exhibits the data on crop production as stated by the respondents in the Kamrup, East Garo and North Tripura districts of the selected states. It has been found that the marketable surplus of marginal and small farmers in foodgrains is in meager volume, accounting for about 12 percent of their total production. However, the marketable surplus of large farmers in cereal crops is found to be 45 percent of their production on an average. The cash crops like cotton in Kamrup and East Garo districts of Assam and Meghalaya had 90 percent of marketable surplus whereas the farmers who have secondary occupation as handloom weaving used about 6-7 percent of the production. The cotton after manual ginning is being used for yarn reeling at the household level in Assam and Meghalaya. There is about 95 percent of the marketable surplus or fruits and vegetables available with the farmers across the sample districts.

Cost of Production

The cost of production per acre of various food and cash crops seems to be higher in the northeastern region as compared to other states due to high wages of agricultural labour, paucity of farm inputs and physical infrastructure prevailing in the region. The Table 6.6 shows the average cost of production of the major crops cultivated by the respondents. The data reveals that a large number of farmers incur Rs 10-25 thousand per acre in cultivating the food and cash crops. The principal attributes to the production cost are wages and input costs like seeds and fertilizers. The small and marginal farms in the selected districts are not mechanized and the farmers do not hire tractors, harvesters, weeding machines or other light machines for agricultural operations. However, the large farmers holding 10 acres of land and above use the farm machinery during the sowing and harvesting operations.

Marketable Surplus

Amidst various constraints in farming in the northeastern region a small number of farmers are not satisfied with the production and marketable surplus, they get out of their land. The Table 6.7 exhibits the marketable surplus of major crops grown by the respondents. About 50 percent of the respondents stated that they are satisfied with the production and marketable surplus derived from their land despite physical and financial constraints in farming activity observed in their village. The status of marketable surplus of major crops across the sample status is shown in figure 6.1.

Marketing

Marketing of agricultural produce in the northeastern region is a major problem due to infrastructure and lack of alternative channels available with the farmer. It has been observed that the private traders procure the farm and non-farm produce at the village through their agents. The farmers also feel convenient to dispose off their produce at the village as it save their time and energy in transporting the produce to the urban markets.

Marketing Practices

The Table 6.8 exhibits the selling practices existing in the sample districts. It may be seen from the data the about 50 percent of the farmers sell their produce in the village market which are largely unorganized and are held periodically in the village. The large number of itinerant traders who procure the farm produce including the fruits and vegetables attends such markets. The traders who have informal contract agreements of procuring the cereals, fruits, oilseeds (Mustard) purchase from the farmers soon after the harvest at their doorsteps and 16 to 30 percent farmers stated that they have such practice. However, it has been found that about 32 percent of the respondents stated that they take their foodgrains to the regulated markets for sale. The figure 6.2

illustrates the practice of sales of agriculture produce in the sample districts of selected states in the NE Region.

The Table 6.9 shows the channels that operate in the agricultural and rural marketing in the northeastern states. It may be observed from the above Table that a large number of farmers sell their agricultural and horticultural produce to the agents of the traders who collect it either from their conventional storage at house or from the field during the post-harvest period. The itinerant traders in the rural market also play a significant role in agricultural marketing as about 65 percent of respondents stated that they used the itinerant traders as the channel for marketing their food and fruit crops in the village market. These traders also visit the regulated market on a scheduled date for holding transactions. As discussed earlier the transaction pattern in the rural markets shows two categories, firstly, the traders purchase agricultural and horticultural produce against the money advanced to the farmer for agricultural operations. Under such deal the farmer is also at the disadvantage as he has to compromise for the lower pre-harvest price and adjust more volume of the produce towards the interest of the debt availed. The Table 6.10 exhibits the buying arrangements, which prevail in the sample districts and the transaction patterns followed by the respondents. Secondly, the farmers sell their produce to the available channels in the village at comparative by lower price than the urban markets in order to avoid the problems of transport. The marketing channels available to the farmers and the pattern of business involvement with them are exhibited in figure 6.3.

Logistics

The farmers and village entrepreneurs face major problem in transporting their produce/-manufactured goods to the urban markets for sale at remunerative prices. It has been observed that over 50 percent of the farmers and entrepreneurs transport their saleable on head loads, as the public transport in the region is expensive and many times inaccessible from the village. The movement of goods through the trucks is very limited due to terrain conditions. The Table 6.11 exhibits the movement of goods in

the region. The head loads are carried to a distance of 5-10 kilometers on an average to reach the rural market or a point from where the motor transport is available for transporting the goods to urban or terminal markets. The figure 6.4 depicts the rural transport patterns in the sample districts. The Table 6.12 reveals the distance travelled by the farmers and entrepreneurs with their non-farm goods to reach the market. The transit loss of small volumes of food crops amounting to less than 10 percent of the total produce transported, and 28.1 percent of oilseeds in Kamrup district has been reported. The transit loss for the same crops was borne by over 50 percent of respondents in the East Garo and North Tripura districts. The accessibility to the rural and urban markets in the study region is shown in figure 6.5. The Table 6.13 shows the status of transit loss of various crops as observed by the respondents. It may be seen from the data that the transit loss was found to be higher in case of fruits and vegetables due to improper packaging and lack of adequate knowledge of post-harvest management.

Market Information System

It has been observed that in the rural markets in the northeastern region the marketing activity is largely dominated by the private traders and often the rural producers suffer from the distress sales. There is no awareness among the farmers and entrepreneurs in the non-farm sector about the prices in the neighboring markets and under such circumstances the rural producers largely accept the price quoted by the traders. It was found during the study that 56.3 percent and 45.8 percent respondents were aware of the market prices in Kamrup and East Garo districts while awareness on prices was found lowest with only 27.6 percent respondents in the North Tripura district.

The Table 6.14 exhibits the sources of market information available to the farmers and other non-farm sector entrepreneurs. It may be seen from the above Table that the information is gathered through inter-personal communication of the fellow farmers and entrepreneurs. The traders also help in disseminating market information and the data reveals that above 30 percent respondents were aware of the market trend in terms of quality and prices though this channel. The government and media were found to be an

ineffective channel for providing market information according to the primary data of the study.

Marketing Decisions

It has been found during the study that irrespective of market information the farmers dispose off their produce immediately after the harvest is over for various economic reasons. The Table 6.15 shows the trend of disposal of marketable surplus by the farmers. It may be observed from the data that the a large number of farmers dispose off the marketable surplus of their produce immediately after the harvest, however, about 20 percent of the respondents revealed that they hold back the surplus in anticipation of the better price in the future. The marginal farmers were found disposing off the surplus in small quantities in the market as per their monetary requirement. The attitude of farmers in disposal of agricultural produce is shown in figures 6.6.

It has been observed during the study that the farmers have not build-up their attitude to sell their produce in the regulated markets. However, during glut of the produce or low demand in the private market the farmers pursue the agricultural marketing authorities to help in selling their produce. The regulated markets have not attracted the farmers to identify this channel as the most beneficial channel for various reasons. The farmers do not get the desired facilities in the regulated markets like storage, grading, and help in negotiating better price for the produce. The Table 4.16 details the farmers' perceptions about the facilities used by them in the regulated markets. It may be seen from the data that farmers are not happy about the room storage and cold storage facilities provided at the regulated markets. However, the display platforms for the produce has been well constructed as opined by the respondents of the study. It has also been stated by the respondents that there is no intervention of the staff of the regulated market committees while negotiating the price with the traders, as there is no auction system prevailing in the study region. It has also been stated by the respondents that the agricultural inputs like seeds, fertilizers and pesticides are not sold in the regulated market premises, as is the practice in many states other than the northeastern region. The Table 6.17 exhibits

the channels of input supplies and the buying practices of the farmers thereof in the study region. The data reveals that about 50 percent of the farmers buy agricultural inputs from the traders. The cooperative societies in the regions sell small volume of fertilizers to the farmers.

Grading and Packaging

It has been observed during the study that the farmers do not possess adequate knowledge about the grading the produce and its impact on the price. The traders also do not grade the produce at the village market level. However, the physical grading is done by the traders at the terminal markets for forwarding the produce to the other markets and processing units. The Table 6.18 exhibits the farmers' views on grading their agricultural produce. It may be observed from the above Table that about 40 percent of the respondents of Kamrup district of Assam stated that the physical grading of the produce is done at the farm level by the farmers while in the East Garo and North Tripura districts such activity has been taken up by a small number of farmers. However, about 26 percent of the farmers stated that the traders did grading of the produce at the time of buying for the convenience of differentiating the price and the sometimes the crop was graded by the variety of seeds used.

As stated in the state profiles of the selected states for the study in the previous chapters, the packaging of the foods and fruit crops at the farm level is conventional and suffers from quality deterioration and transit loss. It has been observed during the study that the over 70 percent of the farmers use bamboo baskets for storage and transportation of cereals and fruit crops. Only the large farmers use jute bags for storage and transportation of food crops and oilseeds. About 20 percent farmers have stated that they use jute bags for transporting the produce to the market. The traders provide jute bags to the farmers who abide with the informal agreement of supplying the produce to the traders.

Problems in Agricultural Marketing

All farmers have stated that they are not satisfied with the existing arrangements of rural markets in terms of their physical infrastructure, coverage of villages, accessibility and market information system. The farmers and entrepreneurs feel that there is a large number of villages, which are not connected to the rural markets and are deprived of in transacting the farm and non-farm produce therein. The rural godowns are not available either at the panchayat level or in the district headquarters for storage of the produce. A large number of farmers are not aware of price movements in the principal market yards within the state and the neighboring markets as official channels are out of reach of the farmers. The farmers in large number are in favour of contract farming as the traders assure procurement though the price paid is lower than the price existing in the market. However, the advantage stressed by the respondents in the contract farming is the advance money paid by the traders at the time of sowing operations which helps them to a large extent in meeting their input costs. The respondents as an inactive agent feel that the regulated markets in the entire states do not provide desired services to the farmers. In all, it may be stated that the private traders are predominant in the marketing of produce of farm and non-farm sector in the region.

Statistical Tables of Chapter 6

Table 6.1

Occupation Distribution of Respondents in the Selected Districts

(N = 142)

Regional Spread		Occupation Distribution					
		Agriculture		Cottage Industry		Services & Business	
State	District	Primary	Secondary	Primary	Secondary	Primary	Secondary
Assam	Kamrup	71 (100)	-	-	51 (71.8)	-	20 (28.2)
Meghalaya	East Garo	24 (100)	-	-	16 (66.6)	-	8 (33.3)
Tripura	North Tripura	47 (100)	-	-	35 (74.4)	-	12 (25.5)
Overall		142 (100)	-	-	102 (71.83)	-	40 (28.17)

Table 6.2

Land Use Pattern of Respondents

(In Acres)

Region Spread	District	Category of Land	Land Holding Size			
			Up to 2.5	2.6 – 5.0	5.01 – 10	10 & Above
Assam	Kamrup	Dry	36 (50.7)	16 (22.6)	-	-
		Irrigated	18 (25.3)	1 (1.4)	-	-
Meghalaya	East Garo	Dry	12 (50)	-	-	-
		Irrigated	6 (25)	-	-	-
Tripura	North Tripura	Dry	23 (48.9)	-	-	-
		Nomadic	24 (51.1)	-	-	-

Figures in Parentheses indicate percentage to the sample size of respective Districts

Table 6.3

Annual Income of Respondents

(Rs in `000)

States	District	Categories of Income				
		Up to 12	12-15	15-30	30-45	45+
Assam	Kampur	2 (2.8)	15 (21.1)	33 (46.4)	21 (29.5)	-
Meghalaya	East Garo	-	7 (29.1)	12 (50)	5 (20.9)	-
Tripura	North Tripura	2 (4.2)	8 (17)	17 (36.3)	20 (42.5)	-
Overall		4 (2.8)	30 (21.3)	62 (43.6)	46 (32.3)	

Figures in Parentheses indicate percentage to the Total Sample

Table 6.4

Cropping Practices of the Respondents in Selected Districts

(No. of Respondents)

Region Spread		Category of Crops						
State	District	Cereals	Spices	Cash	Fruits	Vegetables	Plantation	Others
Assam	Kamrup	46 (64.7)	37 (52.1)	49 (69)	36 (50.7)	34 (47.8)	11 (15.4)	8 (11.2)
Meghalaya	East Garo	18 (75)	11 (45.8)	17 (71)	11 (45.8)	8 (33.3)	3 (12.5)	4 (16.6)
Tripura	North Tripura	47 (100)	6 (12.7)	-	45 (95.7)	43 (91.4)	-	-

Figures in Parentheses indicate percentage to the Total Sample

Table 6.5

Average Production of Major Crops Cultivated

(No. of respondents)

Region Spread		Production In Quantals	Crops						
State	District		Cereals	Spices	Cash	Fruits	Vegetables	Plantation	Others
Assam	Kamrup N = 71	25	-	1 (1.4)	-	12 (16.9)	8 (11.26)	3 (4.2)	5 (7)
		26-50	-	15 (21.1)	9 (12.6)	20 (28.1)	19 (26.7)	11 (15.4)	1 (1.4)
		51-100	6 (8.4)	20 (28.1)	39 (54.9)	5 (7)	1 (1.4)	1 (1.4)	-
		100 & above	40 (56.3)	1 (1.4)	-	-	-	-	-
Meghalaya	East Garo N = 24	25	-	-	-	2 (8.3)	1 (1.4)	2 (8.3)	4 (16.6)
		26-50	-	4 (16.6)	5 (20.8)	8 (33.3)	2 (8.3)	1 (1.4)	-
		51-100	1 (1.4)	7 (29.1)	12 (50)	2 (8.3)	2 (8.3)	-	-
		100 & above	17 (70.8)	-	-	-	-	-	-
Tripura	North Tripura N = 47	25	-	1 (2.12)	-	-	3 (6.3)	-	-
		26-50	-	5 (10.6)	-	14 (29.7)	21 (44.6)	-	-
		51-100	13 (27.6)	-	-	31 (63.9)	19 (40.4)	-	-
		100 & above	34 (72.3)	-	-	-	-	-	-

Figures in Parentheses indicate percentage to the Total Sample

Table 6.6

Average Cost of Production of Major Crops

(Rs. in `000 per Acre)

Region Spread		Cost per Acre			
State	District	Up to 10	10-25	25-40	40+
Assam	Kamrup	5 (7)	36 (50.7)	27 (38)	3 (4.3)
Meghalaya	East Garo	1 (4.16)	14 (58.3)	9 (37.5)	-
Tripura	North Tripura	3 (6.3)	29 (61.7)	15 (31.9)	-
Overall		9 (6.3)	79 (55.6)	51 (35.9)	3 (2.1)

Figures in Parentheses indicate percentage to totals of respective districts

Table 6.7

Status of Marketable Surplus of Various Crops Cultivated by Respondents

(No. of respondents)

Region Spread			Crops						
State	District	Volume In Quintals	Cereals	Spices	Cash	Fruits	Vegetables	Plantation	Others
Assam	Kamrup N = 71	25	36 (50.7)	35 (49.2)	41 (57.7)	27 (38)	23 (32.3)	11 (15.4)	3 (4.2)
		26-50	8 (11.26)	1 (1.4)	6 (8.4)	1 (1.4)	-	1 (1.4)	-
		+51	2 (2.8)	-	-	-	-	-	-
Meghalaya	East Garo N = 24	25	15 (62.5)	10 (41.6)	15 (62.5)	9 (37.5)	7 (29.1)	2 (8.3)	1 (4.12)
		26-50	2 (8.3)	-	1 (4.12)	-	-	-	-
		+51	-	-	-	-	-	-	-
Tripura	North Tripura N = 47	25	29 (61.7)	5 (10.6)	-	40 (85.1)	37 (78.7)	-	-
		26-50	17 (36.1)	-	-	4 (8.5)	2 (4.2)	-	-
		+51	-	-	-	-	-	-	-

Figures in Parentheses indicate percentage to the Total Sample

Table 6.8

Selling Practices of Agricultural Produce

(No. of respondents)

Place of Sales	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Door Steps	15 (21.1)	4 (16.60	7 (29.1)
Village Market	35 (49.3)	12 (50)	24 (51.06)
Regulated Market	21 (29.6)	8 (33.3)	16 (34)
Overall	71 (100)	24 (100)	47 (100)

Figures in parentheses indicate percentage to column totals

Table 6.9

Marketing Channels Used by the Farmers

(No. of respondents)

Channel of Marketing	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Agent of Trader at the door Steps	56 (78.8)	15 (62.5)	32 (68)
Itinerant Traders in Village Market	41 (57.7)	17 (70.8)	32 (68)
Trader in the Regulated Market	43 (60.5)	13 (54.1)	28 (59.5)

Figures in parentheses indicate percentage to the total sample size of respective districts

Table 6.10

Transaction Patterns in Rural Markets for Farm and Non-Farm Products

(No. of respondents)

Transaction Patterns	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Purchase Against Money Advanced	58 (81.6)	10 (41.6)	14 (29.7)
Purchase at Village Market on Low Cash Payments	13 (18.4)	14 (58.4)	33 (70.2)
Overall	71 (100)	24 (100)	47 (100)

Figures in parentheses indicate percentage to column totals

Table 6.11

Rural Transport Practices

(No. of respondents)

Mode of Transport	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
On Head Load	20 (28.16)	7 (29.1)	16 (34)
Public Transport	40 (56.33)	12 (50)	21 (44.68)
Trucks	11 (15.49)	5 (20.8)	10 (21.2)
Overall	71 (100)	24 (100)	47 (100)

Figures in parentheses indicate percentage to column totals

Table 6.12

Accessibility to Market Place

(No. of respondents)

Region Spread		Distance Traveled (In Kilometers)						Overall
State	District	Up to 5	5-10	10-15	15-25	25-50	50+	
Assam	Kamrup	3 (4.2)	24 (33.8)	31 (43.6)	5 (7.04)	8 (11.26)	-	71 (100)
Meghalaya	East Garo	3 (12.5)	9 (37.5)	4 (16.6)	2 (8.3)	5 (20.8)	1 (4.1)	24 (100)
Tripura	North Tripura	1 (2.12)	22 (46.8)	11 (23.4)	2 (4.25)	5 (10.63)	6 (12.76)	47 (100)

Figures in parentheses indicate percentage to row totals

Table 6.13

Status of Transit Loss

(No. of respondents)

Crops	Extent of Loss (in percent)	Region Spread (State/Districts)		
		Assam	Meghalaya	Tripura
		Kamrup	East Garo	North Tripura
Food Crops and Oilseeds	< 10	20 (28.1)	13 (54.1)	24 (51.06)
Fruits and Vegetables	11-20	53 (74.6)	14 (58.4)	33 (70.2)
Other Crops	Insignificant	22 (30.9)	9 (37.5)	14 (29.7)

Figures in parentheses indicate percentage to the total sample size of respective districts

Table 6.14

Dissemination of Information on Prices of Farm produce and Non-farm products

(No. of respondents)

Channel of Market Information	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
PrivateTraders	25 (35.2)	8 (33.3)	18 (38.2)
Inter-personal Communication	31 (43.6)	8 (33.3)	11 (23.4)
Market Board/Government Officials	5 (7.04)	-	1 (2.12)
Media (Press/Electronic)	-	-	1 (2.12)

Figures in parentheses indicate percentage to the total sample size of respective districts

Table 6.15

Trend of Disposal of Marketable Surplus

(No. of respondents)

Occassion	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Immediately after Harvest	37 (52.1)	11 (45.80	20 (42.5)
When price is Higher	17 (23.9)	5 (20.8)	11 (23.4)
Whenever Money is Required	15 (21.12)	8 (34.04)	16 (34.04)
Overall	69 (100)	24 (100)	47 (100)

Figures in parentheses indicate percentage to column totals

Table 6.16

Farmers Perception on Facilities at Regulated Markets

(No. of respondents)

Services Offered	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Display platforms of Produce	51 (71.8)	13 (54.1)	27 (57.4)
Storage Chambers	26 (36.6)	5 (20.8)	11 (23.4)
Cold Storage	1 (1.40)	0	-
Primary Grading of the Produce	-	0	-
Help in Negotiating Price	21 (29.5)	9 (37.5)	18 (38.2)
Overall supervision in transactions	12 (16.9)	5 (20.8)	18 (38.2)

Figures in parentheses indicate percentage to the total sample size of respective districts

Table 6.17

Channels Supplying Agricultural Inputs

(No. of respondents)

Channels of Input Supply	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
Traders	22 (30.9)	6 (25)	19 (40.4)
Cooperatives	32 (45.07)	12 (50)	19 (40.4)

Figures in parentheses indicate percentage to the total sample size of respective districts

Table 6.18

Grading Agricultural Produce Followed

(No. of respondents)

Grading Practices	Region Spread (State/Districts)		
	Assam	Meghalaya	Tripura
	Kamrup	East Garo	North Tripura
On-Farm Physical grading	29 (40.8)	6 (25)	10 (21.2)
Traders grade at the time of buying	18 (25.3)	10 (41.6)	19 (40.4)
Produce graded as per the crop variety	10 (14.08)	4 (16.6)	6 (12.7)
No grading is done at any level	13 (18.3)	4 (16.6)	12 (25.5)
Overall	71 (100)	24 (100)	47 (100)

Figures in parentheses indicate percentage to column totals

Figure 6.1
Status of Marketable Surplus of Various Crops Cultivated by Respondents

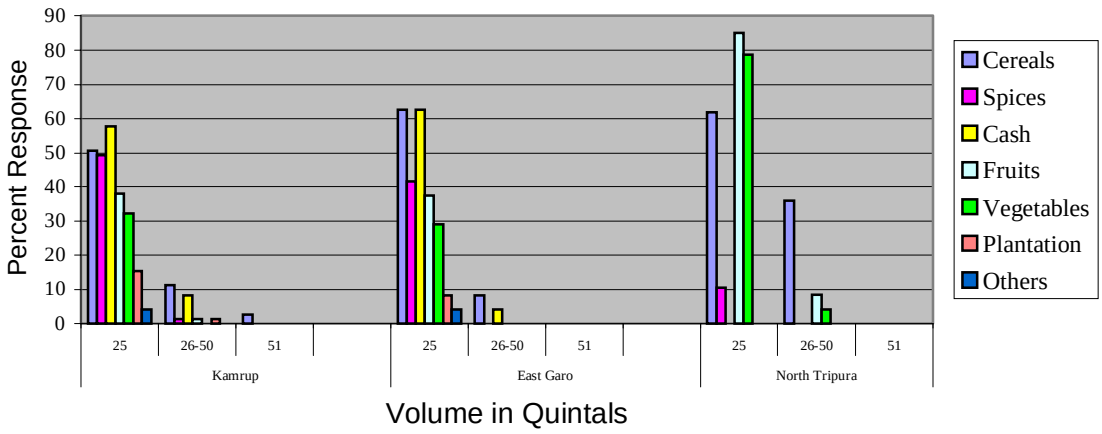


Figure 6.2
Selling Practices of Agricultural Produce

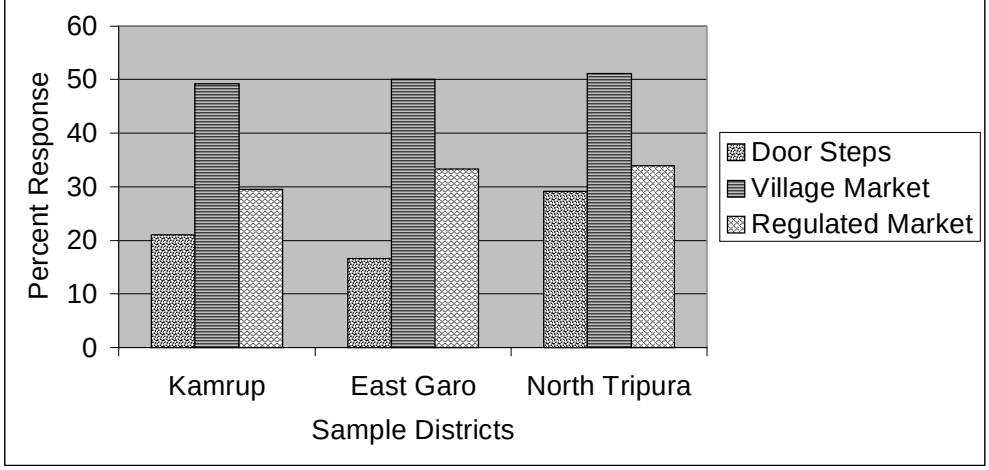


Figure 6.3
Market Channels Used by the farmers

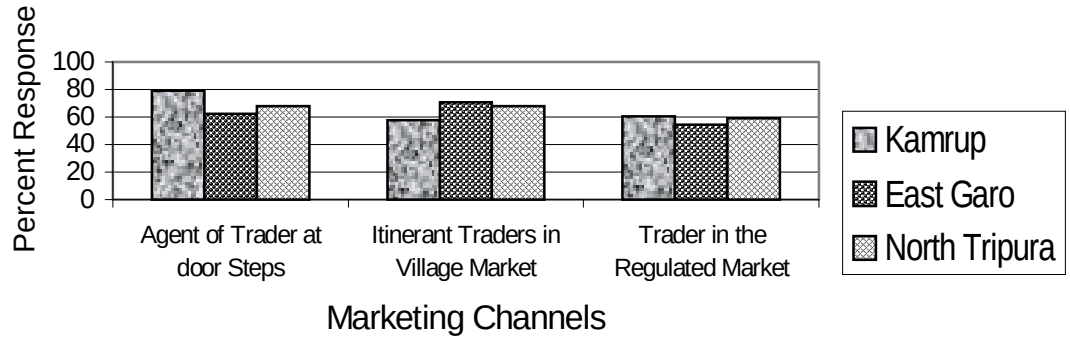


Figure 6.4
Rural Transport Practices

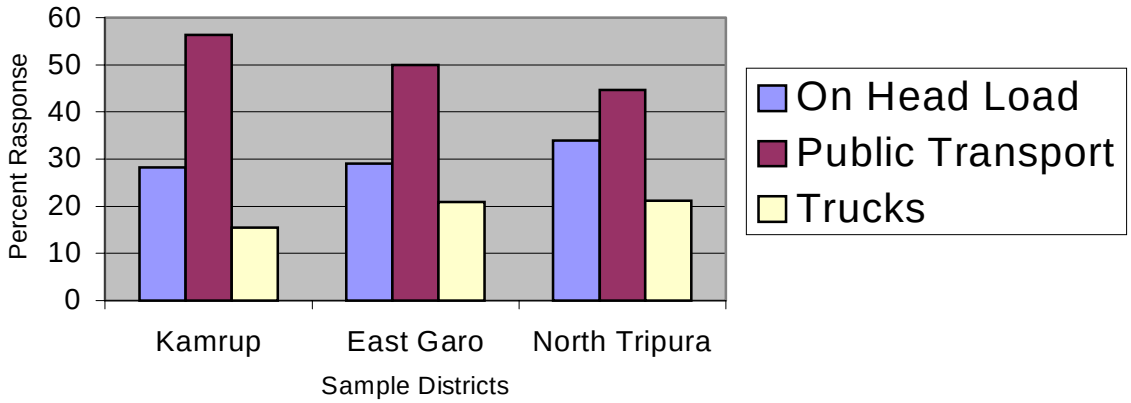


Figure 6.5
Accessibility to Market Place

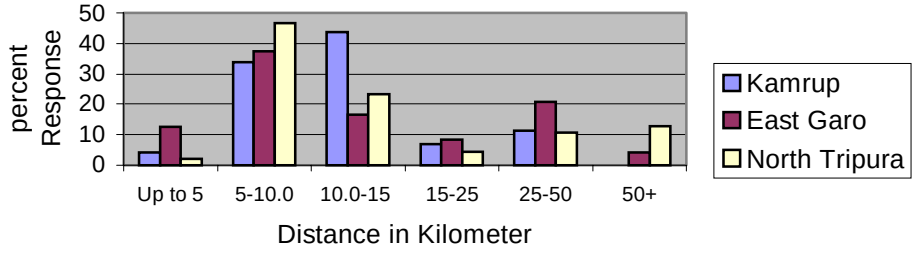
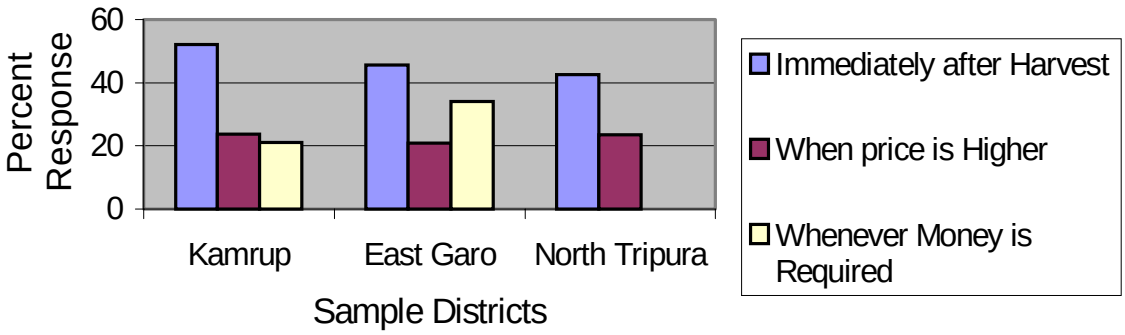


Figure 6.6
Trends in Disposal of Marketable Surplus



Chapter 7

PLANNING FOR AGRI-PROCESSING ENTREPRISES IN NE STATES

Medium Scale Enterprise

Agri-processing activities in the north-eastern region largely consist of fruits and vegetables, spices and grain processing. There is enormous potential for the processing activities of the horticultural and food crops in the north-eastern region which also envisages the scope of agro-industrial infrastructure like cold storage, pre-cooling chambers, packaging plants and other ancillary activities. Over 5000 fruits and vegetable processing units have been established in India but there are only a few in north -eastern states. This potential is not utilized even to the extent of 1 percent of the total production of fruits and vegetables in the region. The spread of the processing units in the fruits and vegetable sector in the country is largely of cottage scale which accounts for about 70 percent of the total plants accounting for about 50 tons of processed products per annum.

The major fruit crops in the north-eastern region include pineapple, banana and orange while the potato, tomato and onion constitute the principal vegetable varieties. Besides, the spices are also grown in the north-eastern states and have scope for commercial processing. It has been found that there is an increasing potential for exports of the processed products from India and the contribution of the NE states may turn significant provided the processing potential of F&V , food crops and spices is utilized to its optimum level. The Table 7.1 exhibits the production of major fruits and vegetables in the NE states. The following discussions in this chapter highlights the project plans for the processing of major fruits grown in the NE states and value additions to the spices in reference to the commercialization.

The places suggested for the project in the NE states are based on the in-depth discussions with the officers of the agriculture and industries departments of the respective state governments, financing institutions like commercial banks, SIDBI and NABARD and the entrepreneurs who have expressed interest in taking up the agribusiness projects in the state.

Pineapple Processing

It has been found during the study that the pineapple processing in the NE states particularly in Meghalaya, Upper Assam and Tripura would be economical provided there is total market assurance. The cost of production and logistics contributes the largest share in the determining the maximum retail or wholesale price for these products and it has been estimated to be higher by 2 times the price of the product available in the domestic market. It has also been found that the cost of production and marketing can not be brought down below certain level. Hence it advisable to look for setting up of the total export units under the export processing zones. The fully export oriented units (EOUs) can be set-up for pineapple processing units in the places where the backward and forward linkages in terms of availability of raw materials, power, roads, cold storage, packaging facilities and the like are accessible. In view of the above requirement the following places may be selected for setting-up of the pineapple processing units. Assessing the available infrastructure , the study suggests that the EOUs for pineapple processing may be planned in the following places as stated in the Table 7.2.

Table 7-2 Proposed Sites for Pineapple Processing as Full EOU

State	Proposed Place	Proposed Principal Products
Meghalaya	Tura and Nongpoh	Slices and Jam
Assam	Nalbari and Sibsagar	Dehydrated Fruits and Jam
Tripura	Two units already exits	By-products

The EOUs in agro-processing sector would provide the encouragement to the entrepreneurs for venture development, market assurance and quality production. Such enterprises will also receive all the benefits of the EOUs like duty free imports, soft loans and other managerial subsidies. The export obligation would be the driving forces for the entrepreneurs to prove growth in their business. The buyback agreements may be taken from the companies at export destinations and market assurance may be guaranteed in such manner.

Project Profile (Estimates) of the Pineapple Processing Unit –Manufacturing Pineapple Jam/Beverages in the NE States

This is a fully export oriented project. The main use of the product will be preparing the Jam and beverages. The unit is estimated to produce 12 MT per day of Pineapple jam/concentrate. In 3 shifts. The estimated outlay of the project is Rs 286.37 Lakh. The technology used by the Germen Agro-processing Units may be borrowed. There is a need to identify a collaborator for the project with a capacity to invest in equity in tune of Rs 30 Lakhs. The product has a ready European market where Pineapple is not grown but has developed good market for its products. The firm may have buy-back commitment from the collaborator. The USP of the project may be "Natural Product" without any preservatives or colours as the European markets prefer to avoid the products with synthetic ingredients.

The total cost of the project with an installed capacity of 600 Mt/year is estimated at Rs. 286.37 lakhs. The breakup is as below (Rs. in lakhs).

(a)	Land		
(b)	Development of Land		13.80
(c)	Buildings		5.00
(d)	Plant & Machinery		9.00
(e)	Utilities		202.00
(f)	Misc. Fixed Assets		2.50
(g)	Preliminary expenses		4.00
(h)	Pre-operative expenses:		
	Interest during construction		
	Other overheads		12.25
	(including upfront fee)		13.96
(i)	Contingencies		10.00
(j)	Deposits		2.00
(k)	Margin for working cap		11.26
		Total	**286.37**
Means of Finance			
Equity			146.37
Term Loan			140.00
Loan Participation break-up:			
Own Capital			90.00

The study found on discussing with various processing industries in different states that the manufacturing different product s from pineapple would cost on an average an out lay of Rs. 325 lakhs with a production target 10 MT per day on 3 shifts basis for an effective capacity utilization. The following project delineates the economics of the jam manufacturing unit suggested at medium scale in the NE region.

One of the salient features of this project is that the collaborator shall make available to the joint venture company without charge all such technical data and information as shall be necessary for the joint venture company to manufacture, sell and service licensed products and all products related thereto.

Profitability at Optimum Level

a.	Installed capacity	:	600 MTS/year
b.	(3 shifts & 300 days per year)	:	
c.	Optimum utilization	:	85%
d.	Optimum sales	:	Rs. 262.29 lakhs
e.	Cost of Sales	:	Rs. 265.66 lakhs
f.	Profit before interest and depreciation	:	Rs. 104.28 lakhs
g.	Profit after term loan interest and	:	Rs. 74.84 lakhs
h.	depreciation	:	
i.	Cash accruals		Rs. 150.79 lakhs
j.	(year of T L closing)		

Financial Ratios:

a.	D.E ratio		0.95:1
b.	Promoter's contribution		37%
c.	DSCR		2.23:1
d.	I.R.R.		22.52%
e.	Break even point	:	47.61%
f.	Pay back period	:	5 years
g.	Return on investment	:	24.96%
h.	Security margin	:	48.63%
i.	Return on Capital employed	:	22.78%
j.	PBID/Sales as %	:	40%
k.	Operating profit/Sales	:	29%
	Employment	:	33 persons
	Implementation period	:	12 months

The requirement of raw material for the project is 12 metric tons/day. Kannara variety of pineapple which is more commercially grown is alone used in the project. Except during the lean season of 4 months the supply is in substantial quantities. Even during the lean season sufficient availability is there: however, the quality of the fruit is not very good, and hence harvesting during this period is controlled to a bare minimum. The price during the season and during the lean season could vary by almost 60%.

SPICES : Value Addition

There is a growing market for value added spices in India and abroad. There is significant production of ginger, chillies and turmeric in the states of Assam, Meghalaya and Tripura. The processing of spices has better domestic and international markets with value added price. A number of existing spices exporters have themselves moved from exporting raw spices to processing it for the domestic and foreign markets.

Indian spices are superior in quality and have established good name on account of their better spicy constituents. Basically, spices are used in food preparations as an adjunct to improve the palatability of foods. Many spices possess medicinal properties and are widely used in the Indian system of medicine. The demand for spices in value added form like spice powders, curry powders, spice oils and oleoresins in the national and international markets is reported to be growing at a faster rate. Some of the projects that can be started in this area include:

Blended Spice Powders

Capacity: Recommended capacity is around 1 ton per shift, per day. Assuming 300 working days on single shift basis annual installed capacity is fixed at 300 MT.

Infrastructural Requirements:

Land: Approximately 5000 sq.ft. of land with permission for industrial use is required.

Building: Total constructed area of approx. 1500 sw. ft. for the machine hall (1000 sq.ft.) storage godown (400 Sq. ft.) and office (100 Sq. ft.).

Raw Material: Various spices are required in different proportions based on the end product. The spices could easily be procured from local sources.

Power: Machines proposed to be installed have an aggregate demand for 25 KVA. Connected load is recommended at 30 KVA of 3 phase nature.

Labour: Basically, a Production Manager supported by 5 unskilled labourer would be sufficient to manage production operations. Support service by way of Lab Chemist (1 No.) andFitter (1 No.) make up as the rest of the technical team.

Plant & Machinery: The machinery involved in operations are listed below. No import is required and they are locally fabricated and supplied.

- Micropulversier along with accessories
- Stainless steel ribbon blender
- Stainless steel storage tanks
- Augur doser weighting and sealing M/C.

Cost of Project

Description	Amount (in lakhs of Rs.)
Land	1.00
Building	2.25
Plant & Machinery	8.53
Other Investments	0.25
Capital Expenses	
Pre-operative expenses	8.00
Int. during construction	0.70
Total	8.70
Sub-total	20.73
Contingencies 10.00%	1.97
Total Value of Capital items	22.70
Margin for working capital @ capacity 50.00%	7.30
Total Project Cost	30.00

Spice Powder

Different kinds of spices and spice powders are at present exported from India to more than 160 countries. On an average about 80,000 tons of spices and spice products are exported from India annually.The main steps involved in the preparation of spice powders and curry powers are pre-cleaning, drying, roasting, (optional), mixing of spices, grinding, sieving, mixing, fumigation, packing and storage.CFTRI can assist the interested parties to establish spice powder plant under a technical consultancy arrangement.

Spices, Oil and Oleoresins

The major uses for spice oils in the importing countries are in food industry, wherein oil is used for flavouring processed meat, pickles, sauces, seasoning, beverages- alcoholic and non-alcoholic. The other uses are in perfumery components, frangrances and pharmaceuticals. Spice oleoresins or spice extracts are largely used for food flavouring in the importing countries. They are convenient to use and store while it is easy to maintain the uniform flavour characteristics.

Spices Oils	
Capacity:	annuam60 Mt/
Working	300 days/annum
Infrastructure	
Land:	4,000 sq.m
Building	900 Sq.m
Plant and Machinery	Grinders, stainless, Extractors, vacuum still,distilationunit, drier, desolventiser, storage tanks and auxiliary facilities
Cost of Project:(Rs. in Million)	
Land and building	3.28
Plant and Machinery	10.50
Auxiliary equipment	2.43
Other fixed assets	2.70
Know-how/preliminary and pre-operative expenses	2.17
Working capital margin	5.75
Total:	23.25
Means of Finance (Rs. in million)	
Equity	7.,75
Equity Share capital	5.75
Subsidy	2.00
Manpower: About 75 persons	15.50
Turnover and Profitability	23.25

Production and export of essential oils from India were primarily based on aromatic herbs, largely for perfumery uses. Spice oils produced and exported from the country include celery seed oil, ajwain oil, cardamom oil, ginger oil, pepper oil, anise seed oil, cinnamon and cinnamon leaf oil. The potential for production and marketing of spices oils appears to be encouraging from the country's performance in export trade during the recent past and the moderate but definite growth rate in the consuming industries in developed countries.

The process for spice oil consists of cleaning, drying of raw materials, pre-processing and steam distillation. The distillate is condensed and water phase separated to produce the oil. The de-oiled materials is fed into extractors where it is subjected to batch-wise counter current solvent extraction. The extract having 15-18% of solid content is distilled. The oleoresin after complete removal of solvent is filled hot in suitable containers. The technology on spice oil and oleoresins has been developed at CFTRI, Mysore

Value Added Agro-Processing Projects in the Horticulture Sector

Horticulture has enormous potential in the north-eastern states both for domestic and export markets. The processing of fruits and vegetables would further provide value addition and help in paying remunerative prices to the farmers. In spite of the infrastructure and territorial constraints the horticulture processing in the north-eastern states may attempt to make niche products for the domestic and international markets. Such projects may look for joint venture partners and strategic business alliances. There are some horticultural processing projects briefed below that may be considered for implementation in the NE states.

Vegetable Processing Plant (EOU)

This unit is advised to be developed under the EOU scheme. The suitable locations for the projects seem to be Shillong in Meghalaya and Tezpur in Assam. These units may produce dehydrated vegetables and canned vegetables in a preservative medium. Onions, beans, ladies finger, leafy vegetables and the like may be used for dehydration in the plants. The present world market for the dehydrated vegetables is estimated to $ 310 Million and is expected to increase to $360 Million by 2002. The average growth of

demand in the international market is estimated to be around 10 percent per annum. There is an increasing demand for the quality dehydrated vegetables.

The installed capacity of the project may be 3 tons per hours with annual production capacity of 7200 tons. The total investment in this project would be Rs 16 million. The operating profit is estimated to be Rs 81 million in the first year and the IRR is estimated to be 16.5 percent . The project managers may look for the improved plant and machinery either under the EOU scheme or arrange through joint venture partners, if the project is proposed as a joint venture. It is essential for the project managers to ensure buy-back marketing support . This can be done for the domestic and export markets. The EOU would also provide opportunity to sell 25 percent of the goods in the domestic tariff area (DTA) along with their target of exports in order to fulfill the export obligations as per the EOU norms.

There are many units of dehydrated vegetables in Maharashtra and an EOU is located in Buldhana in Nasik district of the state. A detailed study of on the operational variables of the project can be made on this plant for deriving lessons and strategies.

Banana Processing

Banana processing in India is an attractive agribusiness because there is an increasing demand in the global market. The domestic market can also be explored as banana concentrate is used in the confectionery industries. Banana is one of the major fruit crops in the NE region and particularly in Meghalaya and Assam. The unit may produce banana pulp. The plant and machinery may also be used for processing the mango and papaya pulp on the commercial scale. The installed capacity of the unit may be 10 tons per hour for optimum economy. The annual production capacity of the plant may be 15000 tons .

The project for banana processing may be planned in Lower Assam in Rangia located on the main broad gauge train line close to Guwahati. This unit would be able to receive the raw material for processing from all parts of Assam, Meghalaya and Nagaland. The total investment will be Rs. 261.70 Millions and the operating profit of the project is estimated to be Rs. 26.96 million for the first year. The IRR is estimated to be 21.5 percent . The projects is proposed to be a total EOU and may enjoy the tax holiday on profit, duty exemption on capital goods and packaging and part of retention and repatriation of foreign exchange.

The benefit may also be taken by the project subject to negotiation with the government and joint venture partners. The joint venture alliances may be explored in the areas of technology, finance, packaging and buy-back.

Orange Processing

The growth rate of the orange juice consumption in the country is 16 percent and its share in the total fruit juice and natural beverages market is 55 percent. However, there exists the possibility of export to the European markets and that can be explored by establishing the EOUs in the NE states like Tripura where the orange production is significant and the quality of the fruit is suitable for extracting juice. The present world trade is estimated to be 2 million tons and Indian exports of fruit juices is estimated to be only 2 tons during 1995-96. The main market for India is exporting Mandarin orange juice to Japan. The orange juice project may be considered for setting up in Agartalla in Tripura state as an EOU . The project accordingly may enjoy all incentives applicable to EOUs like tax holiday on profit, duty exemptions on capital goods and packaging material and repatriation of the foreign exchange. The project may further look for strategic alliances on technology, finance and marketing. There is an assured market for the orange juice in DTA which lies in the hotel, tourism and travel sector. The installed capacity of the project may be 5-10 tons per hour with an annual production of 25,000 tons. This unit can be used for production of orange juice, concentrate and peel oil, papaya pulp, tomato pulp and pectin. The total investment of this unit will be about Rs 220 million with an IRR of 23 percent.

Packaging

Packaging of fruits and vegetables plays an important role in agribusiness enterprise. It is necessary to ensure the availability of packaging technology, packing material and storage facilities. The packaging industries for corrugated fibre boxes, corrugated paper boxes, tetra packs and aseptic packaging plants may be set up in Assam at appropriate location. This could be convenient for supplying the packaging material to all the fruit processing units in the NE states.

Table VIII-3: Impact of Inappropriate Packaging

Impact	Reasons
Vertical Impact	Dropping of packages while unloading from the carrier
Horizontal Impact	Shunting of railway wagons
Vibration	Engine vibration of carrier
Static Compression	Stacking in warehouses and carriers
Transient Compression	Packages stacked in rolling pitching ship
Deformation	Uneven support due to floor surface and uneven lifting
Puncture and Snagging	Projections on vehicles
High Temperature	Exposure to sun and heat transmission from the ship boilers
Low Temperature	Cold storage temperature variations
Water Impact	Rain, spray, condensation
Water vapour	Relative humidity of atmosphere (Natural or artificial)
Biological	Insects, rodents and microbes
Human	Pilferage and inspection

The packaging for the fruits is required to keep them together for enabling convenient handling during the transportation and storage. An appropriate packaging is also required to protect the produce against any physical damages and to communicate the intermediaries on the variety, quality, destination, weight, level of toxic residual, if any etc. The packages maintain their integrity through out the network of distribution under varied transportation and storage conditions. In addition a good package for fruits protect the fruits against bruising and impact by load-spreading and cushioning, retard the transmission of external compressive forces to the contents during the staking of cartons. In addition an appropriate external graphics and printing of information helps the distributors and consumers to know about the statutory sales data and make purchase decisions accordingly. The consumer packs of fruits include perforated polyphonic plastic bags, window cartons and boxes of paperboards with plastics cushioning. The usual capacity of packages is between 15-20 Kg, which is also suitable for carrying by head loads. Smaller weights of 2-5 Kg are generally used for fruits. The transport packs are to be made in to the unit loads either on pallets or other cargo devices.

Corrugated Fibre-Board (CFB) Boxes

The CFB boxes are widely used for the transport containers because of the following advantages:

- Excellent physical and strength properties
- Low cost to strength ratio
- Non-abrasive and cushioning properties
- Surface for coating and lamination
- Good printable surface and appearance
- Efficient recycling ability and bio-degradability

CFB boxes are available in a large variety of styles and shapes as described in the international Fiber Board Case Code. The strength of the CFB box depends on the quality of craft paperboard used and the efficiency of fabrication of the boxes. It is recommended to use virgin craft board for packaging of fresh produce as it possesses high strength and low moisture absorption (Cobb Value). The moisture content of the board material has direct bearing on the compression strength of the box. The compression strength of CFB box is recommended to be such that it can carry a load of minimum 2-5 meters high in the actual condition. The CFB boxes of test compression strength of 5 times the stake load is recommended to be used as the relative humidity remains high in case of fruits.

Good air circulation is obtained in the CFB boxes by the provision of ventilation holes. The size, shapes and position as well as the number of vents depends on the size of the box and contents. Vents in the box panels need not be positioned close to the vertical edges as they considerably reduce the staking strength. In case of the double telescopic boxes care need to be taken to match the vents with the upper and lower parts of the box. The cushioning material used inside the box is generally paper shavings that work as good shock absorber.

Standardization of Packages

A regulation of packaging is a pre-requisite for export of games in view to maintain constant quality of fruits. The individual exports may have specific packaging requirement as per the needs of the importers or the destination country standards. The organisation for Economic Cooperation and Development (OECD) has prescribed standards for the international packaging of fruits. The Inland Transport Committee of the Economic Commission for Europe has adopted a draft resolution and drawn few recommendations on the standards for the packaging of fruits and vegetables in (ECE). The package modules need to be adopted in

such a fashion that could fit on the pallets. The quality of packaging materials and packaging should be monitored constantly in order to achieve good result in the actual shipment. The following commonly tests are employed for the quality evaluation of the packaging of fruits.

- CF Boards: Flat crush test, short column test, bursting strength, puncture resistance, Cobb test, flute height etc.
- CFB Box: Compression test, vibration test, drop test, inclined impact test and revolving drum test etc.

It is necessary to follow the specifications for the grape box in the manner as stated below and mention them on the packaging boxes for international markets.

- Style
- Type of packaging material used, International Fibre-Case Code,
- Outer dimension in mm.
- Ventilation holes and percentage aeration
- Content weight gross and net when packed in Kg.
- Cobb Value in Gm/m^2
- Compression strength in Kpa
- Number of stacking layers

There are different international codes of boxes and style of packaging for fruits. They are one-piece case (code 0201), full telescope (code 0320), case lid (code 0301); die-cut full depth lid (code 0422/314) and die cut part depth lid (code 0422/314). The buyer and seller should pack in bamboo baskets or wooden boxes or CFB cartons or HDPE crates or as agreed fruits. Packaging material such as paper cuttings or any cushioning material used should be soft, clean and free from any taint liable to impart any objectionable flavour to the fruits. While packing, care should be taken that the fruits are not unduly pressed when the lid is closed and all packages are securely closed. The fruits in any container shall be reasonably uniform in shape, size and colour characteristic to the relevant variety, maturity and ripening.

MARKING:

Each container/ package should be marked with the following particulars:

- Commercial name of the variety and the area of production.
- Grade
- Net weight
- Address of the packer and date of packing
- Destination

Planning of Small Scale and Cottage Agro-Processing Industries

There is considerable scope in India for developing modern fruit and vegetable preservation industry, as a small scale or cottage scale industry. There are varieties of fruits and vegetable products which can be processed on small scale such as canned fruits and vegetables jam, jellies and marmalades, pickles, chutneys, preserves candied and crystallized fruits, squashes and syrup.

The fruit products order of the Government of India has laid down some guidelines regarding building, equipments, personnel, capital involved, production targets etc for small, medium and large scale unit of fruit and vegetable preservation in India. Cottage scale factory has a capacity of annual turn out of not more than Rs. 50,000 whereas a small scale factory is one with manufacturing products having an ex-factory sale value of not less than Rs. 50,000 and not more than Rs. 1,00,000. The cottage scale plant should have an area of 23 to 93 square meters with potable water supply of 0.45 kilolitre depending upon the quantum of production ranging from Rs. 10,000 to Rs. 50,000. Whereas small scale factory should have a manufacturing area of at least 200 square meters and potable water supply should not be less than 1.13 kilo litres per day.

The capital outlay on all the above items would not normally exceed Rs. 7,000 (say Rs. 10,000) excluding the cost of buildings, stores and office. The equipment and accessories would be suitable for preparing many of the useful preserved fruit and vegetable products. The items mentioned are readily available in the country. For heating and sterilization, gas ovens or kerosene stoves are quite handy. Where large quantities of cans and bottles are to be sterilized, a charcoal or wood furnace with chimney will have to be provided at extra cost.

The small - scale units will be well suited for adoption by women's organizations, demonstration fruit preservation centres, community canning centres etc.

Need of Processing

Fruits and Vegetables in general have short shelf life due to their high moisture content, The water activity and pH range of perishables favour the spoilage. Various physical , chemical and preservation methods are used to avoid huge. losses of fruits and vegetables. There is a range of

processed food products. such as RTS beverages ,canned and bottled fruit and vegetables , fruit juices , fruit pulp , jams , jellies , squashes . concentrates, pickles , preserves, , Chutneys Dehydrated and frozen fruits and vegetables. These products have good market value. The basic objective of processing of fruits is preservation and developing products up to consumer acceptance . There are different methods of preservation based on physio-chemical principles. Some methods are more commonly used for preparation of fruit products.

CANNING

Canning is the thermal method of preservation in which prepared fruits are filled in a can within a liquid medium, which is de-aerated , sealed, then heated up to a specific temperature for definite time & cooled. As a result the product will be safe from microbial hazards and spoilage. The Two basic principles of canning are destruction of microorganisms by use of high temperature and use of Airtight Containers. The fruits pass through several processes before turning out as the finished product.

SELECTION OF FRUITS

The quality of product largely depends upon raw material. During the selection of fruits for canning following points should be considered.

(a) Varieties :- All varieties of fruits are not suitable for canning as canning is a thermal process.

In India some varieties are developed considering process of canning.

(b) State of maturity – Several important biochemical changes occur in fruit from maturity to ripening. Selected fruits should be ripe but firm and evenly matured. Over-ripe fruit is generally infected with microorganisms and would yield a pack of poor quality under ripened fruit will generally shrivel and toughen on canning

(c) Shape of Fruits- The shape of fruits should be attractive and uniform. Deformities in fruit hinder the product quality.

(d) Microbial Count- The fruits should be free from all blemishes, insect damage and malformation. These deformities favour the presence of micro organisms and create complications in processing.

(e) Freshness- Raw materials for canning should be absolutely fresh. Post harvest changes affect the product quality.

SORTING AND GRADING-

After preliminary sorting the fruits are graded for the uniformity in products. Different types of mechanical grader like screen grader, roller grader are used, but hand grading is more common in India.

WASHING

The graded fruits and vegetables are washed with water in different ways such as soaking or agitating in water, washing with cold water, water spray etc. Electrical fruits-vegetable washing machines also used for this purpose.

PEELING

Coring, Pitting & Cutting .- The cleaned fruits are prepared for canning by peeling coring, blanching etc. Fruits are peeled by hand with knife, by machine, by heat treatment and by lye solution, there are special knives for coring & pitting of apple, pineapple etc.

BLANCHING

Fruits are not blanched like vegetables in boiling water. In small canneries perforated baskets are used for blanching. In large canneries belt conveyors are used for blanching

FILLING

Prepared fruits are now filled in cans. Before filling the cans are washed with water or subjected to a steam jet. In large canneries jets of compressed air or water are used for washing. In most of the factories open tanks containing hot water are used. In some units simple device for steam sterilization of cans has been designed. In India filling by hand using rubber gloves is the common practices

SYRUPING

The canned fruits are boiled with hot sugar syrup to improve the taste of canned products, to fill the interspaces between the fruits in the can and to facilitate further processing. The syrup should be

added to the can at a temperature of 79°c to 82° leaving suitable head space in the can. 3.2 to 4.7 mm. of space left inside. Facilitates closing with double seaming machine. Syrup is drawn into cans through horizontal pipe, having row of small holes. The cans travel on a continuous belt. Cane sugar (Sucrose) used for syrup is usually prepared by hot water or cold water process, Before filling syrup it is essential that the strength of syrup (Concentration of sugar) should be checked, which is expressed in terms of Brix or Balling. It can be determined by Brix or Balling hydrometer at 20°c. temperature. Another instruments used for determination of sugar percent are Baum Hydrometers and Refractometer.

LIDDING OR CLINCHING

In conventional method cans are covered loosely with the lid and passed through exhaust box. Due to some disadvantages, lid process has now been modernized by the "Clinching Process. " in which lid is partly seamed to the can by a single first roller action or a double seamer. The lid remains sufficiently loose to permit the escape of dissolved as well as free air from the contents and also the vapour formed during the exhaust process. Counting and cooling device are also generally incorporated in the clinching machine.

EXHAUSTING

Before final sealing it is necessary to remove all the air from the contents. This process is known as " Exhausting" Removal of air helps in creating vacuum in upper space of can, reducing tin corrosion. Pin holing during storage also helps in maintaining the quality of products. The temperature of syrup between 79°c to 82°c is effective. Overfilling or under filling of the cans should be avoided at this stage. Creating vacuum is very important in controlling bulging of cans which affect the marketability of canned products. Vacuum in the can after exhausting depends on several factors such as time , temperature of exhaust head space in the can altitude etc. A can sealed at a lower altitude will show a lower vacuum inside than at a higher altitude. Cans with a low vacuum generally become "Springer" at high altitudes, though the contents remain fit for the consumption.

Containers are exhausted either by the heat treatment or by mechanical means. In heat exhaust method the can is passed through a tank of hot water at about 82-87°c on a moving belt through a covered steam box. In the "Water Exhaust Box" the cans are placed in such a manner that the level of water is 1.3c.m. to 2.5 cm. below their tops. The time varies from 5 to 25 minutes, depending on the nature of product. At the end of the exhaust the temperature at the of centre of can should be

about 79°c. In the case of glass jars "vacuum closing machines" are generally used. The jar is placed in a closed chamber in which a high vacuum in maintained.

SEALING

After exhausting the cans are sealed by special closing machines known as "Double Seamers" These are of various design and capacities. These are hand operated as well as semi automatic and fully automatic. Airtight sealing is also known as "Hermetical Sealing." In bottling "Vapour Sealing" is used.

PROCESSING

In canning, processing refers to heating and cooling of canned foods to inactivate microorganisms. It works as partial sterilization. The selection of time and temperature for processing depend upon kinds of fruits and vegetables & size of cans. Almost all fruits can be processed at a temperature of 100°c .The centre of the can must reach this temperature for sufficient time, but over cooking should be avoided.

Heat penetration in cans - Generally Thermometer is used to determine the temperature. To study the heat penetration in the can, "Thermocouple, fixed to the centre of the cans are used.

Processing methods - Usually three types of cookers are used for processing of fruits - open cookers, continuous non-agitating cookers and continuous agitating cookers. Commercially, cookers are modified and used in canning of non-acid vegetables are known as "Retort". Retorts are of different capacities, which can hold 50 to 3000 cans at a time. Commonly horizontal and vertical retorts are used. In India small vertical stationary rotors are generally used.

COOLING

After processing the cans are cooled to stop the cooking process, to prevent stack burning especially in the cans at the centre, where they remain hot for several hours. Improper cooling affects the quality of product and may result in the development of "Flat Sour" by the heat resistant spore forming bacteria. In this case the cans do not show any bulging but the contents will be sour.

Cooling is done by (i) Immersing or passing the hot cans in cold water tanks. (ii) Spraying with jets of cold water (iii) Turning in cold water into pressure cooker. (iv) Exposing the cans to air in small lots

when water supply is scarce. Various types of equipments from simple open galvanized iron tanks to the complicated automatic coolers are available

TESTING FOR DEFECTS

Batches of finished cans should be finally tested for leakages or imperfect seals. A simple way for this is to tap the can top with a short steel rod, a clear ringing sound indicates perfect seal while a dull and hollow sound implies a leaky or imperfectly sealed cans. Experienced workmen seldom fail to detect defective seal. In another method vacuum inside the cans is tested by means of a simple gauge fitted with a sharp point pierced in the lid of the can protected with a thick rubber gasket. Vacuum in the can is directly read on the dial of the gauge, faulty can do not show any vacuum. Vacuum tester is also helpful which is developed by CFTRI Mysore. A Flip tester is also available.

LABELLING, STORING AND PACKING

The outer surface of the can should be perfectly dry, small traces of moisture are likely to induce rusting . The cans are labeled by hand or by machines. Label should mention the date of manufacture, date of expiry name of manufacturer. License Number and permitted colours & preservatives, additive. This ensures the quality of products. Now cans are packed in strong wooden cases or corrugated cardboard cartons or in standard packing. They should be stored in a cool and dry place till dispatching.

In India basement stores are helpful specially during summer months, as the temperature in these stores is lower by about 6^0 to 8°c compared to the outside temperature. Storage at high temperature

Minimum requirements for small scale & cottage canning unit

One chemist or B.Sc. (Agriculture) and one Diploma holder in fruit preservation course should be deployed as supervisor

Production Cost	(i) Upto Rs. 50,0000 Sales turnover
	(ii) Rs. 50,000 To Rs. 1,00,000 Sales turnover
Area	(i) 23 Sq. meter to 93 sq meter
	(ii) 186 sq meter.
Water Supply	1.13 kilo litre / day.
Washing of fruits & vegetable	90.92 lt capacity tanks 181 ltr tank washing of bottles
Preparation of fruits vegetable	1.86 sq mt. 4.65 sq. mt. (tin coated or stainless steel tables, Peeling, slicing, Trimming, coring, weight grader, pineapple eyerm, pineapple puncher corer, utensils for Blanching, Vat, 5 to 10 trays.

For Tanks with crates processing, furnace, boiler, double seamer, thermometer, cooling unit, pressure cooker, Exhaust Box-Semi-automatic, Retort (100 A -21/e cans/ change Incubator, pressure can tester etc.

shortens shelf life, forms hydrogen that causes swelling & perforation in cans.

CANNING OF PINEAPPLES

PINE APPLES :

In India Pineapple are grown mostly in North Eastern states & West Bengal along the Western Coast and in other parts of the country. Some Varieties of excellent quality with respect to texture taste, flavour and canning quality have been grown in the Coorg area of Karnataka state. Giant Kew and Queen are the two important varieties, Kew is performed for canning.

Harvesting : The fruit is allowed to reach full maturity, not only for maximum flavour and quality, but also texture so that the optimum canning and yield may be attained. Workmen walk along the rows and pick the pineapples from the plants by bending the pineapple sharply. They then cut off the crown with a sharp knife and place the pineapple on a belt of an extended boom that carries it to a large bin on a special truck. The truck also moves the harvesting machine. When the bin is full, the harvesting machine lifts itself off the truck by four hydraulic lift legs, and the truck drives the bin to the

cannery or to the barge for transportation to the cannery. Another truck drives under the harvester, and the picking continues.

Most of the crop is picked during June September, although in remaining eight months of the year there is usually enough crop to permit canning operations for several days of the week on a partial-capacity basis.

The Ginaca Machine : The fruit bins from the fields are lifted mechanically from the trucks and conveyed to a central dumping station. The bins, each holding about 8 tons of fruit, are dumped and pineapples are graded mechanically for size ; each size goes to a Ginaca machine adjusted to its diameter. This machine is entirely automatic in operation. It cuts a cylinder from the centre portion of each fruit, removes the shell, cuts off the shell portions at each end of the cylinder, and removes the core. An *eradicator* scraps the edible flesh from the shell, as completely as possible, for use in the crush pineapple products or for juice.

In India, however, power driven slicing machines and band punches, corers and eye removers, are generally employed. As the fruit contains highly active proteolytic enzymes injurious to the skin, the worker should wear rubber gloves. The fruit, which is at the canning-ripe stage, is sliced on a power-driven slicing machine and the slices are fed to the workers, who remove the outer peel with a curved knife fixed to the edge of the work table. It is, however, preferable to slice the unpeeled whole fruit and then punch out the rings from the slices. From the peeled slices, a circular ring is punched out using stainless steel punches of different diameter ranging from 5.6 to 8.8 cm, the core is then removed with a corer and any remaining eyes and hard portions in the outer periphery of the ring are trimmed off carefully without breaking it. The rings thus prepared are graded visually for size by stringing them on to a stick, dipped in water to remove the adhering broken bits, etc., and then filled into cans.

Trimming : The cylinders from the Ginaca machine are conveyed by belt to the trimmers who inspect each cylinder carefully and trim away any small portions such as the bits of adhering shells at the ends being unsuitable for canning.

Slicing : The trimmed cylinders are carried by chain conveyors though a spray washer to the slicing machine. This machine slices them transversely into rings 1.25cm thick for No. 2 1/2 cans.

Grading and Packing : From the slicer, the pieces of pineapple pass on to endless belt conveyors from which they are removed by operators who pack them into cans. The grading for different grades

is done while passing through the belt. Certain packers pick out the pineapple which is to go into the fancy grade : others pick out seconds and broken slices which are packed separately. After hand filling into the cans, the pineapple goes either to an exhaust chamber or to the vacuumizing chamber, or directly to the syrup making machine.

Prevacuumizing : These filled cans enter a vacuumizing chamber, where they are subjected to vacuum for 5 to 10 seconds. this operation removes air from the tissues of the fruits and changes their appearance from a chalky white to semi translucency : and gives the product a more uniform colour after canning.

Syruping : The cans are further subject to syrup process in a conventional syrup making machine like rotary and straight line. The PVS machine pre vacuumises the can containing pineapple slices and allows the syrup to flow into the can while dissipating the vaccum. Its main advantages are a substantial saving of the syrup by providing a constant fill of syrup and when used in a conjunction with a vaccum closing machine or a "steam - Vac Closure. Exhausting is not required.

The syrup is made up, in part from juice expressed from the shells and other by - products. The juice is neutralized with lime, heated to throw out calcium citrate, filtered, treated in ion-exchange columns and partially concentrated in vacuum before it is mixed with cane sugar syrup and added to the cans of pineapple, Citric acid is made from calcium citrate.

Double Seaming : The cans are sealed under vacuum by the usual double-seaming operations. The pre-vacuumizing operation and sealing in vacuum make it unnecessary to heat the cans of fruit in an exhaust box.

Processing : The canned pineapples are processed in continuous pressure cookers at a temperature somewhat above boiling until temperatures in the centre of the cans reaches 90^0C. The length of process varies according to the size of the can and other conditions. The cans are cooled in water and are placed in trays and stored in the cooling room until required for labeling and casting.

Cooling : The cans should be cooled in cold water after processing, using rotating cooler, the cans pass from the cooler to a rotating cooker.

Crushed Pineapple : The previously mentioned shredded material is pumped into steam jacketed kettles and heated to 90^0C. Some of the juice is drained away to give a product optimum consistency. If it is to be sweetened, sufficiently heavy syrup is added to give the desired sugar

content. The hot mix is packed into cans automatically, sealed, given a short process to ensure keeping quality, and cooled.

CANNING OF ORANGE

Oranges are canned to a limited extent only. *Satsuma, Mandarin,* and *Unshu* of Japan are the important canning varieties. Being practically seedless unlike the Indian mandarin oranges, such as the loose-jacket mandarin oranges of Nagpur, Coorg, Assam and a few other region, they are preferred for canning. The segments are easier to handle without much breakage, which would otherwise occur while attempting to remove the seeds. *Sathgudi* and *Malta* oranges, which are tight-skinned like the Valencia organge (*Cirus aurantium* or *C. reticulata),* have been found to yield comparatively good canned products. There is a considerable export potential for canned mandarin oranges segments. A great deal of care as well as sophisticated techniques for peeling, exhausting, processing an cooling the cans is needed to get a really good canned product.

The peel of the loose jacket oranges can be removed easily with hand. In case of tight skinned oranges prior dipping of fruits in boiling water, as in the case of grape, is necessary to loosen the skin. The segments are separated and the adhering fibers removed. They are then dipped in boiling lye solution of 1 to 2 percent strength for 20 to 30 seconds, rinsed in warm water, dipped in dilute hydrochloric acid of 0.5 to 1.0 per cent strength to remove traces of alkali, and finally rinsed well in cold water. Any adhering membrane and seeds are removed by hand. The segments are then carefully filled into plain cans containing some water, to prevent undue breakage of the segments during filling. The filled cans are then drained. A small amount of orange flavour may be added to the syrup. The cans are closed preferably on a vaccum double seamer. Alternatively, the filled cans are exhausted for 15 to 20 minutes at 82^0C in rocking type pasteurizing machine in an open tank of water. After processing they are cooled in a rocking type cooler. Precautions are necessary to prevent undue breakage of segments and to minimize the loss of delicate flavour of the orange. Orange segments can also be canned as salad along with other fruits like mango, pineapple, jackfruit, banana, etc. Canning of sliced oranges, instead of segments, has been found to give a novel product. This approaches the new concept of using the 'whole fruit' as in the case of fruit drinks. Broken segments can be profitably utilized for orange jam, juice, squash, etc.

At present, the internal market for canned oranges is rather limited. There is however, good scope for developing an export market for the product.

CANNING OF BANANA

Banana is a important fruit found in India. Unripe form is used as chips, flour and salad Ripened Banana is used for canning. Lot of varieties of banana is grown in India. Some of these are suitable for canning like *Pakshbals, Chandrabale, Nantrun, Rastali, Chakanpuri Kodan , Puvan , Vannan*.

For canning purpose well matured ripe banana of same size and diameters are selected. They are peeled off then pieces of 1/2 to 3/4" diameter are cut & filled in cans. Usually pH of banana slices is 4.5 to 5.3 therefore 0.2 to 0.5% citric acid is added to the syrup. The concentration of syrup should be 25-30^0 Brix 2½" cans are suitable. After exhausting they are processed for 20 minutes at the temperature 212^{0}F. If the pH of bananas is 4.8 or less they can be processed for 15 minutes in water bath and for the high pH banana can be treated at 5 lb pressure for 15 minutes at 227^{0}F at in retorts.

Processed banana are then sealed, cooled, immediately, labeled packed and stored like other fruits.

COMMERCIAL CANNING

Canning is a very important and popular process in fruit preservation. Before planning a commercial unit it is very necessary to consider certain factors, which are essential for the successful running of a cannery.

INVESTMENT

For establishment and running of a canning unit sufficient capital is needed Expenditure in unit are of two types - Non-recurring and recurring. Non-recurring expenditures includes land cost, building of factory, cost of machineries etc. which do not give returns immediately.

Recurring expenses include cost of raw material, fruits, sugar, others ingredients, labour wages. Processing cost, storage, transportation and distribution this investment repays immediately.

At first step entrepreneur should plan carefully. The type and size of production, then other requirements should be decided.

FACTORY SITE

While selecting site for the factory, the following points shouldbe considered carefully :

(a) Adequate quantities of the right type of raw material should be readily available in the locality, because foods are highly perishable and deteriorate during long distance transport.

(b) Proper transport facilities should exist for the movement of raw materials and finished products.

(c) As far as possible the environment should be clean and free from debris, dust, etc. If the factory is to be located in an industrial area, the site should be at a considerable distance from other industrial factories spreading soot, smoke and disagreeable odours, which would adversely affect the quality of the canned product. There should also be facilities for disposal of the cannery wastes.

(d) There should be scope for future orderly expansion of the factory.

FACTORY BUILDING :

The factory building may be single-storied or multi-storied. Where the plant is a comparatively small one and works for short periods during the year, a single storied building of light construction will do. In case of the larger plants, that have to run almost throughout the year, multi-storied construction is desirable as it would facilitate and cheapen the movement of raw as well as finished products. Flooring should be firm and of good cement to withstand the constant use of water and the movement of heavy-wheeled machines. A slope of about 5.5 cm. per meter is necessary for proper drainage. All doors, windows and ventilators should be provided with fine wire-gauze to prevent entrance of flies, wasps and other insects. The roof of the building should be high and well ventilated to provide outlet for vapours and steam. The windows should have large glass panes, and part of the roof should be of ground glass to permit a gentle light inside. There should be provision for efficient artificial lighting as the cannery may have to work at night quite often.

A sufficient number of dressing and toilet rooms should be provided separately for men and women workers in the factory premises. The workers should be taught the importance of personal hygiene. There are important considerations for handling food-stuffs for human consumption.

WATER SUPPLY :

There should be abundant supply of potable water. Large quantities of water are required for cleaning fruits and vegetables, making syrup and brine, washing floors and machinery etc. The water

system should work at sufficiently high pressure so that supplies can be made at different points in the cannery without a break. The water should not be alkaline or very hard, and should be free from organic matter. Presence of iron and sulphur compounds in it renders it unsuitable for making syrups or brines. Saltish water should be avoided, as it would affect the taste of the products. If supply of the desired quality are not available, it would be necessary to install a water softening plant. Further the boiler feed water requires ion-exchange treatment to bring it to the desired pH and make it free from scale-forming ions.

LABOUR :

All the workers in the factory, whether employed on regular basis or recruited during rush periods, should wear clean, clothes and aprons to ensure hygiene conditions. They should be medically examined at regular intervals as a precaution against infectious diseases. An efficient system of chemical and microbiological control at various stages of the manufacturing process should be maintained to guard against the risk of contamination and food poisoning. There should be a trained chemist with assistants to supervise the work and to ensure the desired standard of production.

MACHINERY AND EQUIPMENT :

Great care is needed in the selection of machinery and other equipments, Different types of units are in use, but every manufacturer will have to determine his own requirements. However, as a rough guide, layout plan of a small factory with canning line having output of about 2,000 a 2l 2½ cans per day and a juice plant with a capacity of about 1,000 bottles.

The whole equipment should be arranged in a proper order so that minimum time and effort are needed for handling the products at all stages of manufacture. In short, the raw product should move practically in a straight line till it emerges as the finished product, ready for labeling and packing. During the off-season the entire machinery should be overhauled, greased and painted.

EASE OF TRANSPORTATION :

Transportation of raw material to the canning unit and prepared products from unit to distribution centre should be convenient. During rainy season there should not be any problem of transportation.

AVAILABILITY OF RAW MATERIAL :

Supply of raw material should be near the unit. This reduces the transportation, storage cost and also improves the quality of product.

MARKETING :

This is the most important aspects for smooth running of preservation unit. Before establishing preservation unit the prospects of marketing should be analyzed. Proper means of advertisement should be used for proper sale.

SMALL SCALE PROCESSING OF FRUIT BEVERAGES

In India cold drinks are in demand throughout the year. Among these, fruit juices have an important place being delicious and rich in essential vitamins and minerals. In India preparation of fruit juice is limited to small-scale productions and conventional equipments are commonly used but for concentrated juices like orange, apple, grapes juices modern equipments are in use. These are helpful in conserving the loss in nutritional properties and flavour characteristics. Concentrates are used in soft drinks, pharmaceutical preparations, baby foods, tonic foods etc.

EQUIPMENTS FOR FRUIT JUICES

It is essential that suitable equipment is employed for the successful operation of fruit juice industries.

Washing Equipments :

For citrus fruits rotating cylinder with a helical screw inside to push the fruit along, and fitted with jets of water, forced by a centrifugal pump has been found highly useful for washing loose jacket mandarin oranges. On a cottage scale cement or galvanized iron water tanks are useful.

Sorting equipments :

In small scale processing Batch sorting will be sufficient.

Extraction equipment :

There are two types of extractions.

1. The fruits are crushed and pressed continuously.

2. Fruits are crushed or cut into small pieces, then pressed with a suitable press.

In case of citrus fruits the presence of *albedo, flavado*, oil glands and seeds etc. makes juice bitter with the existing equipments. The bitter components are also extracted to varying extents along with juice. Extraction of juice from peeled segments as such or from segments dipped in lye solution for removing most of the adhering tissues, helps to minimize the bitterness CFTRI Mysore has developed Taglith type of press for juice extraction. There are four types of equipment employed for the extraction of fruit juices - Halving and Burring machines, Continuous screw expeller press, Plunger type press, Roller type press.

Pulping equipments :

These fruit juices contain different suspended matter which are separated from juice by :-

1. Straining or Screening : Different types of equipments in size and capacity are available. A pulpier made of stainless steel with power-driven wooden, metallic or brush paddles, which revolve inside has been highly useful in the case of citrus juices.

2. Setting and Sedimentation : For this purpose. wooden barrels are required.

3. Filtration : Finely suspended particles in the juice are removed by " Filter Press". Frame and Filter press are mainly used for the preparation of cordial.

De-aerator and Flash Pasteurize : Fruit juice contain appreciable quantity of oxygen which is to be removed before packing, by de-aerator. Now juice is subsequently heated in a flash pasteurization equipment.

PREPARATION OF FRUIT JUICES :

Some steps are important in processing of fruit juices such as:-

1. Selection and preparation of fruits

2. Juice extraction

3. Desertion

4. Straining, filtration and clarification

5. Preservation.

The quality of the juice depends on the manner in which these several processes are carried out.

PRESERVATION OF FRUIT JUICES :

Fresh juices are highly attractive in appearance and possess good taste and aroma, but deteriorate rapidly, if held for some-time, thus it is necessary to preserve juice immediately after extraction. The methods commonly used for this purpose are -

1. Pasteurization
2. Addition of chemicals
3. Addition of sugar
4. Freezing
5. Drying
6. Filtration

PREPARATION OF FRUIT BEVERAGES

Fruit Beverages

Fruits most commonly used for preparing beverages are : sweet orange, mandarin *(sangtra)* loose jacket orange. sour lime (*kagzi nimboo or limboo),* lemon, grapefruit, grapes, apple, mango, pomegranate, *phalsa (Grevia asiatica), jamun (Eugenia jambolana),* mulberry, passion-fruit, pineapple etc. Tomato juice also has become quite popular. Among the squashes, sweetened orange juice known as orange squash, lemon squash and pineapple squash are the most popular ones.

Squashes and Cordials

Fruit juices are most commonly packed as squashes or cordials in this country, although canned pure fruit juices like orange and pineapple juice and, quite recently, mango juice are gaining importance.

Orange Squash

Extraction of Juice

Orange squash is prepared from tight-skinned oranges such as *malta,* sathgudi or chinese and *musambi* as well as from loose-skinned oranges like Nagpur and Coorg oranges. Tight-skinned

oranges are cut into halves either with a knife by hand or by means of a halving machine having a circular knife. The halves are pressed by hand against a revolving burr or rose fitted to a rousing machine. The reamed juice is collected in a vessel. It contains plenty of coarse tissues, seeds, etc. To remove these, it is filtered through a net cloth or passed through a sieving machine known as pulpier, in which the juice gets brushed through a stationary perforated cylinder by revolving paddles of stainless steel, wood or fibre brush. The sieved juice is utilized for making squash.

Dipping of the segments in hot lye solution for ½ to 1 minute removes most of parchment - like material enclosing the juice sacs in the segments, so juice is practically free from substances that subsequently causes bitterness in the juice. This juice has been found to be highly satisfactory for canning as pure orange juice as well as for making orange squash. The segments are passed through a screw - type juice extractor.

Preparation of Squash

Sugar, citric acid, flavouring materials, colour and preservatives are added to the juice in correct proportions. Sugar, citric acid and water are mixed and heated . Any dirt is skimmed off. The syrup is cooled slightly and filtered through cloth. The clean syrup is blended with the juice. To improve flavour, peal emulsion of 2 to 4 oranges for every 100 oranges taken or an appropriate quantity of an essential oil and orange essence is added to the squash.

After mixing all the ingredients, a calculated amount of a chemical preservative, namely potassium metabisulphite, approximately about 30gm for every 500 ml of squash dissolved previously in a small quantity of the juice or water is added to the squash. While using stored and sulphur dioxide preserved orange juice for making the squash, allowances should be made for the acid as well as sulphur dioxide added to the juice for preserving it. The amount of sulphur dioxide in the final product should not exceed 350ppm. , which is the upper limit permitted by law. The bottles are cleaned and washed in a bottle washing machine, fitted with revolving brushes or in a washing machine fitted with jets of hot lye, hot water and steam, to clean and dry the bottles. The sterile bottles are rinsed with hot water before filling them with the squash, leaving about1.2 to 2.5 cm of headspace. The bottles are then closed with crown corks or pilfer-proof closures, which have been dipped in one per cent potassium meta bisulphate solution to sterilize them .The bottles are washed, dried and labeled.

ORANGE SQUASH RECIPES

Ingredients	45^0 Brix,*	45^0 Brix	65^0 Brix *	65^0 Brix**
	1.5% acidity	1.5% acidity	2.0%acidity	2.0% acidity
	(kg)	(kg)	(kg)	(kg)
Orange juice	100.0	100.0	100.0	100.0
100 Brix 0.8%				
acidity				
Sugar	165.0	120.0	240.0	180.0
Citric acid	5.0	2.5	6.5	5.0
Essence of orange water				
Orange colour	0.10	0.07	0.10	0.07
Preservative (Potassium metabisulphite)				

Pineapple Squash

Pineapple squash, and pineapple crush, which is similar to squash but with a higher sugar content, have become highly popular in this country in recent years. There is a growing demand for the product practically all over the country. The fruit is sliced and the outer skin peeled off with a curved knife. The peeled slices are cored and then cut into small pieces, which are passed through a screw-type crusher and extractor. Broken fruit slices, which are less then quarters, can be used for the preparation of juice for squash. From the crushed material juice is pressed in a basket press, or in a centrifugal extractor known as hydro-extractor. The clear juice is used in the preparation of squash.

Banana Beverage **:** To prepare banana beverage, firstly banana pulp is prepared then sugar syrup is prepared with citric acid and Ascorbic acid, cooled and clean syrup is blended with pulp. Potassium meta bisulphate is used as preservative. By 1:3 dilution RTS can be prepared.

Juices

Pure fruit juices are very nutritive breakfast foods.

Orange Juice:

Tight skinned oranges like the *malta, sathgudi and musambi* oranges give a good canned juice free from any bitterness. The juice from loose jacket oranges like the Nagpur and Coorg oranges may

develop bitter taste Taglith type press yield juice free from bitterness. Addition of 5 to 6 percent sugar to the juice is also helpful in reducing bitter taste of canned juice.

The juice is de-aerated and flashes pasteurized.

Pineapple Juice

Mauritius, Jaldhoop, Singapore varieties are used for juice preparation. Pineapple juice is generally a by product in the canning of pineapple.

The fruit is peeled, sliced minced or grated the minced material is passed through a screw type juice extractor or pulpier or hydraulic press. The juice is screened through muslin cloth, then heated to about 82 to 85^0C. For canning plain cans are used. The juice is filled hot. The cans are processed for 25 to 30 minutes at 80 to 82^0C (or for 15 to 18 minutes at 100^0C) (No 1 Tall - 448 gm cans) and cooled in water. Pineapple juice in the 156 gm midget cans (15 minutes process a 1psig.) is quite popular as a retail pack.

In the HTST method the juice is quickly heated at 88^0C held at that temperature for 2 to3 minutes and then immediately filled into clean and steamed cans. Which are closed, inverted for a minute or two & then coded. Canned pineapple juice can be stored for a period of 12 to 15 months without any serious loss in quality or nutritive value.

ESTABLISHMENT OF UNIT FOR PRODUCTION OF FRUIT SQUASH :

Enclosed financial details can be used as broad outline for establishment of a cottage scale unit.

Production Capacity

The target to produce about 25000 bottles has been set with each bottle having 1000 ml quantity. An income of Rs. 475000/- is expected if the bottle is sold @Rs. 19/- per bottle.

FINANCIAL ASPECT OF THE UNIT

1. Working plan

A provision (Rs. 5000/- must be kept to give monthly rent for the working place of 200-250 sq.feet.

2. Machines/ Equipments

S. No.	Details	No.	Rate	Cost (in Rs.)
1.	Diesel burner	1	8000	8000
2.	Container	2	500	1000
3.	Juice extractor (of screw types)		24000	24000
4.	Wooden spoons, knives etc.		-	1000
			TOTAL =	**34000**

3. Raw material (Annual)

S. No.	Details	Quantity.	Rate (in Rs.)	Cost (in Rs.)
1.	Different fruits	25000 Kg.	10/Kg	2,50,000
2.	Sugar	3000 Kg.	13/Kg	39,000
3.	Potassium metabiosulphite sodium Benzoate etc.		1000	
4.	Bottles for filling	25000	2/bottle	50,000
5.	Wax to seal the bottles		2/bottle	1000
			TOTAL	**3,41,000**

4. Salaries to the workers

Most of the work would be done by the entrepreneurs himself and a helper would give sufficient help, his monthly salary would be Rs. 1000/-

5. Utilities (Monthly)

S. No.	Details	Quantity.	Rate (in Rs.)	Cost (in Rs.)
1.	Diesel	200 Ltr.	8	1600
2.	Electricity	-	-	300
3.	Water etc	-	-	100
			TOTAL	**2000**

6. Misc. Expenses (Rs/month)

1. Stationery	100
2. Traveling/ Transportation	300
3. Water etc.	100
TOTAL	**500/-**

7. Working capital (Rs./month)

1. Rent of the working place		500
2. Raw Materials		28425
3. Employees/Workers salary		1000
4. Utilities		2000
5. Misc. Expenses		500
	TOTAL	**32,425**

8. Total Project Cost

1. Machinery/Equipments		34000
2. Working Capital (for a month)		32425
3. Miscellaneous fixed assets		3575
	TOTAL	**70,000/-**

9. Finance (Under PMRY)

Entrepreneur's contribution would be 5% of the total project cost and the bank loan would be 95% of the project cost.

1. Entrepreneur's contribution		3500
2. Bank loan		66500
	TOTAL	**70,000/-**

10. Income from the sales (Annual)

Total income would be Rs. 475000/- by the sale of 25000 bottle each sold @19/-

11. Profitability analysis

1. Annual profit	71592
2. Monthly profit	5966
3. Break even point	36%

Suppliers of the Machines / Equipments for Diesel burners

1. Jamali Laghu Udyog Factory
   Plot No. 642, Categorized Market, Bhopal
2. Paragon Industries
   Bogda Pul, Raisen Road, Bhopal
3. It can also be obtained from local markets.

For extracting juice

1. M/s. Relone Metal Works
   Kandiwali Lane,
   Andheri, Kurla road, Bombay 59.
2. M/s. Gardners Corporation
   6, Doctors lance, New Delhi

3. M/s Techno Equipments,
31, Prakash Street, Bombay 4.

4. Continental Equipment India (P)
B-66, Phase-1, Okhla,

Suppliers of the Raw Materials

Raw materials can be obtained from local markets and whole sale markets.

PRODUCTION OF JAM AND JELLY

The manufacture of jams, jellies and preserves are one of the important by products of fruit processing industries, and is based upon the high solid- high acid principle. Not only are such fruit concentrates an important method of preserving fruits, but it is an important utilization of fruits. In addition to the pleasing taste of such preserved fruits, they possess substantial nutritive value also.

Jam, Jelly, preserve, Marmalades, fruit bars and fruit butters are products from fruit with added sugar after concentrating by evaporation to a point where microbial spoilage cannot occur. The prepared product can be stored without hermetic sealing, although such protection is useful. While mold growth on the surface of fruit preserves is controlled by exclusion of oxygen i.e. covering with paraffin wax. But now paraffin wax practice is replaced with vaccum sealed containers; moisture losses, mold growth and oxidation are thus brought under control.

Jam

Jam is prepared by boiling the fruit pulp with a sufficient quantity of sugar to a reasonably thick consistency firm enough to hold fruit tissues in position. In its preparation about 45 parts of fruits should be mixed with 55 parts of sugar and should contain not less than 68.5 per cent soluble solids as determined by refractometer, when cold and uncorrected for insoluble solids.

First of all, the fruit of which the jam has to be made is put into water. About 4 gm of potassium permanganate is put into a litre of water. Later the fruits are peeled and grated in a grater and are cooked well after mixing sugar in it (1 Kg. sugar for 1Kg. of fruit). After cooking it well, pineapple essence (2ml for 1 kg and 3ml. of sodium benzoate for 1kg.) is added. The prepared jam is put into bottles and the bottles are sealed.

Jelly

Jelly is prepared by boiling the fruits, with or without addition of water, straining the extract, and mixing the clear extract with sugar, and boiling the mixture to a stage at which it will set to a clear gel.

The semi-solid food is made by not less than 45 parts by weight of fruit juice ingredient to each 55 parts by weight of sugar. And it should not contain less then 65 per cent soluble solids, flavouring and colouring agents may be added. Pectin and acid may also be added to overcome the deficiencies that occur in the fruit itself.

First all the fruits are finely chopped and put into water (1kg. fruit is mixed with 750ml water and 750gm. of sugar). This is cooked at high flame, after a boil, it is cooked at a low flame. It is again boiled at around 105^0C, froth is agitated out and is separated from rest of the mixture. After that the finally prepared mixture is, poured in a bottle, the bottle is kept for cooling, and finally sealed.

The production process of Jam, Jelly and marmalade is shown in flow chart.

Marmalade

It is fruit jelly in which the slices of the fruit or of the peel are suspended. The term "marmalade" is generally associated with the product made from citrus fruits like oranges and lemons, in which shredded peel is included as the suspended material.

Fruit Butter

It is prepared by taking 5 parts of fruit by weight and 2 parts of sugar by weight and concentrating it to a smooth semisolid product and it should not have less than 43 percent soluble solids.

Fruit Leather

It is same as fruit butter except that concentration should not be less than 77 percent of solids. The fruit leather can be dried in thin layers and drying can be done by solar or cabinet drier.

Preserves

It is made from properly mature fruits by cooking it in whole or in large pieces in a heavy syrup till it become tender and transparent. In its preparation not less than 45 parts of fruits are mixed with 55 parts of sugar and cooking is continued till a concentrate of 68 per cent solid is obtained.

Candied Fruits

Candied fruits are prepared by gradually concentrating fruits in syrups by repeated boiling until the fruit is heavily impregnated with sugar. This process being followed by drying to overcome stickiness.

Glaze fruit is prepared by coating candied fruit with a concentrated solution of sugar and confectioneries, glucose syrup, followed by careful drying to give a transparent glaze to the surface.

Fruit confectioneries

This is a general term used to describe candies in which fruits are used. A large number of products of this character which vary greatly in appearance, texture, flavour, and in the proportion of fruit used in their manufacture are available in the market.

Pineapple Jam

Pineapple Jam is very popular product. For pineapple jam, fresh pulp from broken slices is used. It has been found that about 0.5 to 0.75 percent pectin and 0.5 percent citric acid by weight of the pulp taken and 0.1 percent of pineapple essence is added.

Other Jams:

Orange jam is prepared from lye peeled segments of the mandarin orange. Coorg orange jam is becoming popular due to its full fruit taste and flavour.

Banana jam is not quite popular due to its texture and astringent taste.

Mixed fruit jam, made from a blend of fruits like pineapple, mango, orange, banana etc in different combinations is a popular product.

RECEIPES FOR TYPICAL JAMS

Pineapple Jam :

Pinapple pulp (Fresh or Canned)	75 Kg.
Sugar	75 Kg.
Citric acid	375 Kg.
Pectin, 150 grade	563 Kg.
Pineapple essence	75 ml.

Orange Jam :

Orange pulp (from lye peeled segments)	50 Kg.
Sugar	50 Kg.
Citric acid	250 Kg.

Pectin, 150 grade	375 Kg.
Orange sweet essence	50 ml.

Mixed Fruit Jam :

Blends of pulp (mango, pineapple, orange, apricots, papaya, guava etc.)	
Sugar	equal wt.
Citric acid	0.75 to 1%
Pectin, 150 grade	0.5 to 1% Kg.
Essence	Blends
colour	red

PRODUCTION OF JAM AND JELLY

Enclosed financial details can facilitate planning of a cottage scale unit.

Production Capacity : In the given unit, 22500 bottles of jam and jelly (each of 500 gms) is the production target. The estimated income would be Rs. 4,05,000/- if each bottle is sold at Rs. 18/-

FINANCIAL ASPECT OF THE UNIT

1. Working places : 200-250 sq feet of place is required for this unit, the monthly rent of which would be Rs. 500/-

S. No.	*Details*	*No.*	*Rate* (in Rs.)	*Cost* (in Rs.)
1.	Diesel burner	1	8000	8000
2.	Container	2	500	1000
3.	Pulpier	1	1000	1000
4.	Wooden spoons,		-	500
			TOTAL =	**19500/-**

3. Raw material (Annual)

S. No.	*Details*	Quantity.	Rate (in Rs.)	Cost (in Rs.)
1.	Fruits of different type	10000Kg.	10/Kg	100000
2.	Sugar	9750 Kg.	-	146250
3.	Potassium metabiosulphite sodium Benzoate etc.	-	-	1000
4.	500 gms bottle to fill jam and jelly	22500	2	45000
5.	Wax to seal the pack		-	500
			TOTAL	**2,92,750**

4. Salaries to the workers

Major work would be done by the entrepreneur, the details of additional help is following :

S.No.	Details	No.	Salary	Total Salary
1.	Helper	1	1000	1000
			Total	**10005.**

Utility (Monthly)

S. No.	Details	Quantity.	Rate (in Rs.)	Cost (in Rs.)
1.	Diesel	140 Ltr.	12.5	1750
2.	Electricity	-	-	300
3.	Water etc	-	-	150
			TOTAL	**2200**

6. Misc. Expenses (Monthly)

1. Stationery		200
2. Traveling/ Transportation	200	
3. Water etc.		100
	TOTAL	**500/-**

7. Working capital (Monthly)

1. Rent of the working place		500
2. Raw Materials		24396
3. Employees/Workers salary		1000
4. Utilities		2200
5. Misc. Expenses		500
	TOTAL	**28596**

8. Total Project Cost

1. Machinery/Equipments		19500
2. Working Capital (for a month)		28600
	TOTAL	**48100/-**

9. Finance for the proposed unit

Under PMRY the entrepreneur would have to contribute 5% to the total project cost while Bank loan would be 95%

1. Entrepreneurs contribution		2405
2. Bank loan		45695
	TOTAL	**48100/-**

10. Total production cost (Annual)

1. Working capital for 12 months)		343200
2. Interest over Bank loan @ 15.5% annually)		7083
3. Depreciation of fixed assets (@10% annually)		2000
	TOTAL	**352283/-**

11. Annual Income

22500 bottles of jam and jelly would fetch an annual income of Rs. 405000 if sold at Rs. 18/- each.

12. Profit in the unit

1. Annual profit	52717
2. Monthly profit	4393
3. Break even point	41%

Suppliers of the Machines / Equipments for Diesel burners

1. Jamali Laghu Udyog Factory
   Plot No. 642,
   Categorised Market, Bhopal
2. Paragon Industries
   Bogda Pul, Raisen Road, Bhopal
3. M/s. Gardners Corporation
   6, Doctors lance, New Delhi
4. Continental Equipment India (P) Ltd.
   B-66, Phase-1, Okhla,

Suppliers of the Raw Materials

It is easily available at local markets.

BY-PRODUCTS

By Products From Pineapple

During processing peel of fruits, shells, pulp, cores seeds, trimmings etc. are left as pineapple waste which constitutes nearly 40 to 50 percent of fruit in canning industry and can be used for preparation of some other commercial items.

Juice

All the shells, trimmings and other residues are shredded and pressed in a continuous press to recover as much juice as possible. The juice is refined by de-acidifying and decolorizing and used in canning of the pineapple after mixing with cane sugar syrup.

Alcohol & Vinegar:

This juice can be converted into acetic acid and alcohol by fermentation process. This alcohol is used in automobiles. Pineapple vinegar is also becoming popular.

Citric acid

This pineapple juice can be treated with calcium carbonate and resulting calcium citrate is changed into citric acid by evaporation.

Pineapple Bran

After the juice extraction the press cake is dried in rotary drum driers and dried product is sold as "pineapple bran" for feeding to livestock.

Pineapple Candy

The uneven pieces of slices and cores are treated with 75-80^0 Brix sugar syrup and spread over a tray. and dehydrated. These candies are packed properly.

Jam

The pomace left over after extraction of juice from the peeled fruit, trimmings and cores can be used in preparation of medium quality Jam.

Vinegar

Some caneries prepare pineapple vinegar as by product.

BY PRODUCTS OF ORANGES :

Citrus Peel Oil

The orange peel rays, is used for preparation of oil. One quintal orange peel can produce 1 kg of orange peel oil. Its commercial value is very high. It is used in Candying, Confectionary perfumery, marmalade and in cosmetics. For extraction of oil from orange peel different types of machines and techniques are used, such as fumatic types of press roller with pointed spikes. Some other simpler methods have been also developed at CFTRI Mysore.

Pectin

Residues & Skin is used for preparation of commercial pectin. Citrus peel and residues contain 2-5 to 5.5 percent of pectin. After the extraction of essential oil from the peel and juice from the fruit the residue is dried . The peel should be sliced and ground. The residue is washed with cold water on a

sieve and the washed materials boiled with 0.015 to 0.02 normal hydrochloric acid or sulphuric acid or with 0.025 molar citric acid for 40-45 minutes. The liquid is pressed and filtered. This liquid is clarified by centrifugation or settling. Then solution is treated with enzyme and purified . Now pectin solution is standardized for jelly strength. This solution is canned or bottled or can be converted into pectin powder.

Banana Wastes

In the processing of banana for canning and dehydration, the banana peel is the waste product CFTRI Mysore have developed a method in which the pulpy portion scraped from the thick peel of the banana, can be utilized for the preparation of "Banana Cheese". The pseudo stem of the banana plant can be utilized as raw material for the preparation of paper pulp.

PACKAGING OF FRUIT PRODUCTS

Food packaging is closely related with the production, preservation, storage and marketing of products. Faulty packaging undoes all preservative efforts that food processors have attempted during manufacturing. Packaging performs many functions in addition to preservation such as marketing, value addition of product etc packaging of food is becoming so complex and modernized that packaging division is becoming an essential division in food industries. There are many modified packaging materials along with conventional packaging materials.
There are two types of containers :

Primary Containers

These containers come in direct contact with the food such as a can or Jar. These must be nontoxic and non-reacting to food.

Secondary Containers

These containers have an outer box, case or wrapper that may hold cans or jars but does not directly contact the food. The selection of a package for a food product is governed by the factors like :

(1) The complex nature of the food product
(2) Physio-chemical factors
(3) Product / Package compatibility
(4) The Distribution compatibility
(5) The method of marketing
(6) Cost

Packaging materials used by the processed food industries can be classified as :-

RIGID CONTAINERS

Glass containers

These are fragile and require extra care in handling and during processing. Glass does not contaminate the contents. These are used in the form of Bottles, Jars and Tumblers. Usually this types of packs are preferred for syrups, jam, jelly, pickles, sauces, soft drinks etc.

Metal Containers

Tin containers are employed in canning industry Tin cans are made of thin steel plate of low carbon content lightly coated with tin metal. Cans are available in standard sizes as open top cans, Easy open ends, square tins such as - A1, 1lb Jam AI-T, A2, 1-lb - Butter, 2-lb Jam, A 2½. 7-lb Jam, A10 etc. Cans are preferred for the packing of processed fruits & vegetables, squashes, soup, juice, paste etc.

Aluminum Cans

Two piece cans, three piece cans are used for soft drinks and fruit juices etc.

SEMI RIGID CONTAINERS

Composite Containers

Body is made of paper board tube which is spiral or convolute, wound and ends made of metals. It is commonly used for custard powder and spices etc.

Plastic Containers

Stretch blow moulded / Blow Moulded Containers

Plastic bottles plastic jars (PET & PVC) are used for processed foods, squashes etc.

Thermoformed Containers

Skin packaging, Blister packaging (Polystyrene or PVC) are used for Jams, Cheese etc.

Paperboard Cartons

This type of cartons are available in different styles and used for spices and dried food products.

Bag - in -Box

This consists of a flexible bag fitted with a dispensable valve and outer corrugated fibreboard box. It is used as Institutional and bulk packaging media for packaging fruit juices, fruit pulps etc.

Lined cartons

This consists of duplex board carton printed with required design and an inner heat sealable liner glued to the cartons used for dried products.

FLEXIBLE PACKAGES

Pouches

Pouches are made with laminates or mono film specially suitable for each product which ensures perfect preservation of the product for required shelf life. Different types of pouches such as Flat pouch, Pillow pouch, Three sided sealed pouch, Gusseted pouches are available and used for dehydrated items.

Stand - up - Pouches

These are made of flexible laminates. The pack is self supporting and can stand on the shelf. These are mainly used for pickles, fruit juices etc.

BULK PACKAGES / TRANSPORT PACKAGES

These consist of corrugated fibre board box, Gunny bags and woven sacks, multi wall paper sacks and plastic drums - Open top type or Narrow mouth type (for fruit juices, fruit pulp and purees) for bulk packaging and transportation.

CONTROLLED OR MOODIFIED ATMOSPHERE PACKAGING [CAP/MAP]

In CAP type of packaging natural gaseous environment is modified during storage by balancing the air component. It is commonly used in ware house and throughout the distribution cycle. Whereas in MAP , at the time of packaging, internal atmosphere is modified by balancing air components. This type of Gas or Vacuum packaging is beneficial for oxygen sensitive liquid products like juices etc

ASEPTIC PACKAGING

In international marketing scenario packaging plays an important role. The presentation of product according to the consumer preference has been the major concept emerged in the food products marketing. It has been observed by the market critiques that in view of the increasing conscience towards the eco-friendly marketing strategies, packaging has taken an innovative turn among the other variables in international business. Aseptic packaging has shown potential to catalyse marketing as the canning of food products is gradually being discouraged in the international markets. In India aseptic packaging has been advocated by CFTRI and IIP for promotion of exports and some agro-food companies like NDDB, Dabur, HLL , Marico, AOML etc have already resumed to this category of packaging to promote exports. Hence, aseptic packaging has been emerged as new challenge for the marketing organisations in the developing countries to boost up international marketing performance.

It is different from conventional "Retort" packaging. Sterilized product is packed into sterilized packages in the sterile environment. This method is useful for extending shelf life of fruit juices, tomato sauce, ketchup etc. without refrigeration.

Aseptic Canning

Aseptic canning refers to a technique in which food is sterilized or commercially sterilized outside of the can and then aseptically placed in previously sterilized cans which are subsequently sealed. The point behind aseptic canning is that while food in a container will require many minutes or even hours, depending upon container size to reach sterilizing temperature, food outside a container may be passed through an efficient heat exchanger and brought to sterilization temperature almost instantaneously. Food temperatures employed may be as high as 150^0C (302^0F) and sterilization takes place in 1 or 2 seconds yielding food products of the highest quality.

Quick heating of liquid foods may be done in a plate type or in a tubular scraped surface type heat exchanger. The sterile food must now be quickly cooled with the same plate, with refrigerants instead of steam. The sterile food now enters the aseptic canning lines. The food enters the cans in a sterile filling zone. There is also heated sterile can lid dispenser and a closing machine which seals cans under a steam heated sterile atmosphere. After cans are sealed they are cooled.

Hot Pack or Hot Fill

Hot pack or hot fill refers to the filling of previously pasteurized or sterilized foods, while still hot, into clean but not necessarily sterile containers, under clean but not necessarily aseptic conditions. In commercial practice, most acid juices and vegetables are commonly hot packed, following prior pasteurization or sterilization.

"Flash 18" Process

Where conventional hot pack processing is not feasible for low acid foods, still another method of heating such foods prior to packaging has found limited use. In "Flash 18 " process entire canning line including operating personnel is placed within a room like pressure chamber under a pressure of 18 to 2 *psi*. This controls the violent boiling problem during processing under atmospheric pressure.

Micro Enterprise Strategy [1]

Strategy can be defined as a rational set of time-sequenced actions aimed at gaining a sustainable advantage over competition and improving position with customers. Strategy answers the what and where questions concerning your business. It is a shared vision describing what that the organization should be in the future and where it is going, not how it will get there.

Strategy is the framework managing the "how" choices which determine the future nature and direction of the organization. It focuses on accomplishing maximum and enduring positive differentiation as opposed to the competition in meeting customer values.

The choices guided by strategy relate to the entire range of the organization's products or services, market, principal capabilities, growth rate, return from and allocation of resources.

[1] This section delineates the process of strategy formulation for setting-up micro enterprises. It has been felt by the study team that this information would be relevant for the planners looking for developing the micro-entreprises in the NE states.

Perhaps most importantly, strategies identify critical issues which are the changes, modifications and additions to the organization's structure and systems, to its capabilities and resources. to its information needs and management that result from setting strategy.

Planning

Planning is the approach to making decisions concerning systematic allocation of resources. It is worth emphasizing that planning is a process, not an event. It is organic and ongoing and it is a key element of the overall management process.

Planning is a way of defining your own future and if you don't like what you see, you are able to change your plan.

With the above in mind, it is possible to define a strategic plan as a formal written document of what you intend your firm to become, the vision of its future position and value.

A strategic plan is a detailed, specific declaration of your intentions with regard to customers, competitors, suppliers, investors, equipment, location, employees and the future of your firm. It is a way of getting commitment from management, key employees and other key persons associated with your firm.

Common Problems In Planning Process

- Failure to develop an understanding of what strategic planning really is.
- Failure to accept and balance interrelationships among intuition, judgment, managerial values, and the formality of the planning system.
- Failure to encourage managers to do effective strategic planning through an appropriate rewards system.
- Failure to tailor and design the strategic planning system to the unique characteristics of the company.
- Failure of top management to spend sufficient time on the strategic process.
- Failure to modify the strategic planning system as conditions within the company change.

- Failure to mesh properly the process of strategic planning from the highest levels of management to its complete implementation.
- Failure to keep the planning system simple.
- Failure to secure within the company a climate for strategic planning.
- Failure to secure within the company a climate for strategic planning.
- Failure to link the major elements of strategic planning and the implementation process.

WHAT STRATEGIC PLANNING PROCESS SHOULD DO

- Force an integrated look at total commitments.
- Generate new data about the future.
- Extend time horizons being considered by managers.
- Involve more people in longer-term thinking.
- Develop a systematic method for communication about the future.
- Provide a valuable framework within which to evaluate individual proposals and budget options.
- Allows more effective management of operations.
- Establishes mutually agreed upon commitments.
- Contains sufficient information to lend credibility to its promise.
- Maintains strategic focus.
- Fosters awareness of options and their likely consequences.
- Identifies critical issues, choices and priorities on which management attention must be focused.

- Provides linkage to the system for allocating and committing capital funds.
- Keeps paperwork manageable.
- Accommodates a plurality of managerial and planning styles.
- Becomes woven into the fabric of the organization to become a natural part of getting the job done.
- Most importantly the process can be effectively used to:
- Generate critical information in an orderly and timely manner.
- Identify issues and possible crisis points.
- Improve communications.
- Reinforce teamwork
- Enhance decision making.

Structure Of Completed Plan

- Mission Statement/Objectives
- Product-Service/Market Matrix
- Industry Attractiveness and Market Structure
    - Market/Customer Group Analysis *
- Business Segment Analysis
    - Business Segment Performance Analysis
    - Business Segment Contribution Margin Analysis
    - Generic Competitive Strategies

        - Business Segment Competitive Analysis
        - Detailed Individual Competitor Strategies *
        - Competitive Analysis - Major Competitor Summary *
        - Competitive Analysis - Points of Sale/Contact
        - Business Segment Strategic Plans
        - Detailed Product/Service Analysis
        - Product/Service Line Review
        - Product Life Cycle
        - New Product Evaluation Matrix
        - Product/Services Competitive Analysis
    - Technology Plan
    - Human Resource Planning
    - Organizational Chart
        - Time Allocation *
        - Function Reassignment Plan *
        - Management Depth Chart *
        - Personnel Plan Summary
        - Personal Goals *
    - Management System Analysis
    - Benchmarking/Continuous Improvement *
    - Strategic Financial Data

- Financial ProFormas

Strategic planning is systematic means of making the firm successful through the discipline of strategic thinking and vision used as a framework for all other decisions in the firm. Strategic planning requires and honest evaluation of the company's current situation and where it has been in the past. Finally, strategic planning demands the commitment of the owner/CEO for it to be successful. It requires commitment of resources, both financial and personnel, for its development. It demands complete follow through. A plan that is not carried out due to lack of leadership or the required tools needed for completion is a total failure and a waste of time and money.

Table –7.1

Chillies

State		1984-85	1985-86	1986-87	1987-88	1988-89
ARUNACHAL PRADESH	Area	0.7	0.7	0.8	0.8	1
	Production	0.6	0.6	0.7	0.7	1
	Yeild				100	100
ASSAM	Area	11.4	10.9	11.3	11.4	12.4
	Production	6.7	6.3	6.5	6.7	7.5
	Yeild					605
MANIPUR	Area	4.2	4.2	6	6	5.2
	Production	2.5	2.5	3.7	3.7	3.1
	Yeild					596
MEGHALAYA	Area	1.6	1.6	1.8	1.8	1.8
	Production	1.1	1.1	1.1	3.1	3.1
	Yeild					1722
MIZORAM	Area	1.3	1.7	2.3	2.5	2.3
	Production	2.2	1.8	3.2	3.3	3
	Yeild					1304
NAGALAND	Area	1.2	1.6	0.1	0.2	0.1
	Production	0.8	2.2	0.2	0.2	0.4
	Yeild					4000
TRIPURA	Area	1.5	1.5	1.5	1.5	1.6
	Production	0.7	0.7	0.7	0.7	0.8
	Yeild					500
Total	Area	21.9	22.2	23.8	24.2	23.6
	Production	14.6	15.2	16.1	16.4	18.9
	Yeild		**685**	**676**	**678**	**801**

Table – 7.2

Chillies

State		1989-90	1990-91	1991-92	1992-93	1993-94
	Area	1.1	0.9	1.1	1.1	1.1
ARUNACHAL PRADESH	Production	1.1	1.2	1.3	1.3	1.4
	Yeild	1333	1182			
	Area	12.9	12.5	12.7	12.7	13
ASSAM	Production	7.7	7.6	8.3	8.3	8.5
	Yeild	597	6.8	654	654	654
	Area	5.2	4.7	4.7	5	5
MANIPUR	Production	3.1	2.8	2.8	3	3
	Yeild	596	6.8	596		
	Area	1.8	1.7	1.7	1.8	1.7
MEGHALAYA	Production	1.1	1.1	1.1	1.1	1.1
	Yeild	1722	647	647		
	Area	2.1	2.9	2.9	2.9	3.1
MIZORAM	Production	1	2.3	2.9	2.9	3.1
	Yeild	476	647	1000		
	Area	0.1	0.2	0.2	0.2	0.2
NAGALAND	Production	0.4	0.4	0.4	1.5	1.5
	Yeild	4000	2000	2000		
	Area	1.7	1.5	1.7	1.7	1.7
TRIPURA	Production	0.8	0.8	0.9	0.9	0.9
	Yeild	471	533	529		
	Area	24.9	24.4	25	25.4	25.4
Total	Production	17.2	16.2	17.7	19	19
	Yeild	691	664	708	748	748

Table –7.3

Chillies

State		1994-95	1995-96	1996-97	1997-98	1998-99	2000-01	2004-05
	Area	1.1	1.1	1.1	1.3			
ARUNACHAL PRADESH	Production	1.3	1.4	1.5	1.6			
	Yeild							
	Area	13.1	14.1	14.5	14.3			
ASSAM	Production	8.6	9.4	9.9	9.5			
	Yeild	656	667	683	664			
	Area	6.1	6.6	7.2	7.2			
MANIPUR	Production	3.6	4	4.3	4.3			
	Yeild							
	Area	1.7	1.7	1.8	1.8			
MEGHALAYA	Production	1.1	1.1	1.1	1.1			
	Yeild							
	Area	3.1	2.1	2.8	2.8			
MIZORAM	Production	3.2	2	3.3	3.3			
	Yeild							
	Area	0.3	0.4	0.4	0.4			
NAGALAND	Production	4.5	3.3	3.8	2.7			
	Yeild							
	Area	1.5	1.5	1.6	1.9			
TRIPURA	Production	0.8	0.8	0.9	1			
	Yeild							
	Area	26.9	27.5	29.4	29.7			
	Production	23.1	22	22.8	23.5			
Total	Yield	859	800	844	791			

Chapter 8

Promoting Agribusiness Marketing Channels

In agriculturally progressive areas, agriculture has become big business. The farmer is more and more a manager, running a business organization, which may be part of a huge corporation or cooperative based soundly on chemistry, biology, engineering, and economics. The goal is the same as for any businessman: to maximize profits. The agribusiness manager must be alert to government programs and regulations, must be aware of the newest varieties and growing techniques, and must be knowledgeable about pesticide hazards and hundreds of other details. Every segment of the operation is examined. The most select crop variety suited to soil conditions is chosen; special fertilizer is blended for maximum growth and yield. Chemical weed control is practiced. Irrigation may be used. Pesticides are applied at the best times. All of these have been done by farmers in the past, but now many of these activities are organizations like cooperatives through mutual efforts.

Marketing has changed as much over the years as other aspects of farming. A decade ago much of the farmer's output was sold and consumed at the nearest marketing town. The farmer might also deliver barrels of potatoes and oranges directly to nearby homes.

In most parts of the NE states, Farmers still carry their small surplus to a town market where they trade or sell it to their neighbors. The roadside vegetable stands and farmers' markets are the chief remnants of such direct trade between farmer and consumer. In general the modern farmer's output reaches the market through the hands of many businesses that buy, store, transport, process, package, and deliver it before it is sold to the consumer.

This system is necessary because people use few commodities in the form in which they come from the farm. A farm's product may be also used thousands of miles away, completely changed in form. More than a million commercial firms are engaged in agricultural marketing and processing. The people who handle farm produce en route to the consumer must be paid. Ideally, about 70 cents of every rupee people spend for farm commodities go to the people who buy, handle, sell, package, and advertise it. This should leaves about 30 cents for those who raise the produce, for gaining remunerative price.

To have an alternative dealing with commercial buyers and processors, farm groups often organize cooperatives for the processing and selling of their produce. The extra profits are shared among the

cooperative members. Farm cooperatives should also do business with items as fertilizer, seed, and gasoline in large, money-saving quantities, then sell them to members, passing along the savings.

Understanding the Market

To sell produce most advantageously, the farmer needs to understand the market for particular commodities. The farmers organizations like cooperatives, self help groups, etc., should provide information on prices and related marketing variables. Farmers must be provided with price trends to determine the most favourable time to sell. Various agribusiness services organizations issue reports on the production and prices of crops and livestock for use of farmers. They also forecast future output and furnish market news to newspapers and radio broadcasters. Boards of trade, or commodity exchanges, issue reports of prices for current sales and futures on grains, cotton, soybeans, and other commodities. The cooperatives should have access to such interactive sources. The farmer can increase profits by producing commodities that meet high standards. The Agricultural Marketing Board can play an important role in setting standards and grades for agricultural products.

Commercialization of Agricultural Activities:

Commercial vegetable production and marketing can lead to disaster for the uninitiated and those who cannot afford to take the risks involved. Although these risks can be minimized by careful marketing and production planning, they can never be eliminated entirely.

Many studies and surveys show that many opportunities exist for expansion of fresh vegetable production but they are under-used. Although few producers may abandon the guaranteed prices of food crops and markets for the risks in commercial fruits and vegetable production for high price and quick realization of output. In NE States more adventurous farmers have so diversified, that vegetable production has become their dominant farm enterprise. For many of these growers market opportunities and farm income are not increasing at anticipated level but the cooperatives and SHGs can make them profitable by taking some control of it.

The rates of interest on refinance have been revised downwards in the context of current interest rate regime and the need to provide adequate spread on refinance to the banks w.e.f. 1 May 2000 in respect of term loans for three years and above for Agriculture, Small Scale Industries and Small Road Transport Operators (owning two vehicles) as under :

For purposes other than Minor Irrigation,Cold Storages and Storage of Horticulture produce and financing of SHGs

Size of limit	Rate of Interest (% per annum)			
	Commercial Banks		Coop. Banks/RRBs	
	Existing	Revised	Existing	Revised
Upto Rs.25,000	8.5	8.5	7.5	7.0
Above Rs.25,000 & Upto Rs.2 lakhs	10.0	9.5	9.0	9.0
Above Rs.2 lakhs	11.0	10.5	11.0	10.5

For financing of Self Help Groups

NABARD to Bank		Bank to SHGs	SHGs to Members
Existing	Revised		
7.5	7.0	As decided by the bank subject to RBI stipulations	As decided by SHG

The rate of interest on refinance for financing Cold storages & Storage of Horticulture produce under Capital Investment Subsidy Scheme of Government of India will be @ 8.5% p.a. (all agencies) as indicated in ICD circular No.16/99-2000 dated 5 January 2000. In respect of externally aided projects, the rate of interest as per provisions contained in the relative agreements will apply.

Joint Marketing and Production Decisions

Two major obstacles to success in vegetable production are finding markets and establishing prices. Some producers, attracted by success stories about a particular crop, have carefully researched and grown it. Unfortunately, they never bothered to determine where, to whom, and at what price their products would be sold. Good marketing plans start with the customer and work backwards to production. Potential growers should first determine exactly what buyers want, how they want it, and when they want it. Then, they should determine how these crops should be grown. Even selecting varieties and determining planting times are basic marketing decisions.

Playing by the Rules

For wholesale market channels, growers must play by the buyer's rules. Wholesale produce buyers in the state are well established and are able to obtain products from a variety of sources around the country. Unlike tobacco companies, they don't need the grower's political support. Long-established marketing conventions in the fresh produce industry are unlikely to bend to accommodate new Kentucky growers.

The key to success in produce marketing has always been the establishment of good relationships with buyers over time. New growers, in many cases, will have to prove to potential buyers that they are serious about the business and are able to grow, grade, pack, and in some cases, pre-cool produce in the way the buyer specifies. Unfortunately, high transportation costs make local produce less attractive to buyers out side the state. However, local consumers have more interest in buying fresh, high quality vegetables—part of a rising national demand for fresh, locally-grown products. The demand for fresh products from local growers is also increasing nationwide. At least one large supermarket chain across the NE States can store in feature, the locally-grown produce and apparently would like to feature more value added horticulture products. Consumer interest in fresh F & V is creating more demand and opportunities for both direct and wholesale marketing**.**

Counting the Costs

Despite the apparent opportunities and favorable signs, vegetable production is certainly not for everyone. Day-to-day production decisions regarding pest management, irrigation, and other cultural practices are critical.

To help current and prospective growers evaluate their opportunities. Table 8.1 exhibits comparative Marketing Options for fruits and Vegetables. The growers should pay particular attention to comparisons of marketing time required, compatibility of off-farm employment, and compatibility with tobacco production. Individual situations vary, and producers must often learn about their particular markets by starting small and getting a foot in the door.

The Agribusiness planting decisions should be based on information from several sources, especially of potential buyers, experienced vegetable producers and farmers organizations, and explore what marketing approaches have worked for them. The cooperative and agricultural extension service is another source of information that can be used although vegetable marketing may be unfamiliar to

some Extension agents. (See the "Getting Help" section in this publication for more information about help through the Cooperative Extension Service and other organizations.)

Choosing a Market

Among the main factors influencing success and individual growers' choice of marketing, the prominent options are:

- marketing alternatives and facilities available in the area
- time available for marketing
- potential production volume
- adequate financing
- commitment and attention to details of marketing channels.

Direct Marketing

Direct marketing—marketing directly to consumers—includes sales at local farmer's markets, on-farm markets, roadside stands, farm festival markets, pick-your-own sales, or any combination of these methods. All forms of direct marketing, with the exception of pick-your-own, appear to be expanding in as well as other states in the region. Prices at local farmer's markets are usually higher than wholesale prices, but more marketing time is required by individual growers. Supermarkets and kiosks in urban centres have become popular forms of direct marketing.

On-farm or roadside markets

These markets need not be extensive but do need to be neat, clean, and well organized. A visible location close to high traffic areas is usually a prerequisite for a successful farm or roadside market. Direct marketing can also succeed in more remote locations, but it will require more infrastructure and promotion.

Many consumers in urban centers now consider visits to on-farm or farmer's markets as recreational activities because families enjoy seeing farms and talking with farmers. Some cooperatives have developed seasonal festival days and markets to satisfy this demand like HOPSCOMS in Karnataka, Fresh in Andhra Pradesh. Such food and vegetables stores and some other forms of direct marketing

require liability insurance coverage, large time commitments, and employees with friendly, courteous attitudes.

Pick-your-own, or "U-pick" sales type of direct marketing appears to be increasing nationally because consumers would like to optimize the utility of available time and energy. U-picks eliminate some of the harvesting, transportation, and marketing costs for growers but may require additional management, supervision, and liability insurance coverage, and such facility of marketing is well received with the wholesale traders.

Local town or community farmer's markets

These markets are probably the easiest way for new growers to sell small volumes of produce. Marketing time is required, but individual growers do not usually bear all advertising and promotion costs.

Community-supported agriculture marketing

This a term for marketing by participation through self help groups. Individual growers or a group of growers solicit members within a community who pay a minimal monthly or seasonal fee to participate in a specified mix of fresh vegetables sales on daily or weekly basis. On the contrary, the group also identifies the community as regular buyer on payment of a fixed subscription apart from the price decided for vegetables/fruits by the SHG.

Produce auctions have been popular for small growers in many agricultural produce marketing committees. Growers bring produce to the auction facility, where it is sold to the highest bidder. The auction company (sometimes a growers' organization) charges a flat commission of about 10 percent. Both large and small lots are accommodated at some auctions. At the largest Pennsylvania auction, most of the bidders are operators of medium-to-large retail produce markets and stands. Growers can sell small volumes at a produce auction without having to spend much time in marketing. Serious vegetable production requires serious investment. Plastic mulch and drip irrigation have become standard practices for many vegetable crops.

Marketing Cooperatives

A marketing cooperative is just one form of indirect marketing in which the producer deals with an intermediary rather than the final consumer. Although most forms of indirect marketing require less time of individual growers, they usually demand more product uniformity, quality, and post harvest care. Grower-owned cooperatives or marketing associations are able to assemble truckloads of produce required by large customers, which would not be possible for small growers acting individually. Formally organized cooperatives may also provide technical assistance to growers and help secure seeds, boxes, and other needed supplies. In some cases, specialized equipment is shared by growers. Co-ops usually own and operate facilities with some combination of grading, packing, cooling, and storage equipment for their members. Members typically employ a manager to oversee the co-op's daily operations. Several small growers cooperatives with grading, packing, and cooling facilities can be formed as exists in Maharashtra and Gujarat. They offer good marketing opportunities for new growers in villages near the co-op facilities.

Local Wholesalers, Grocers, and Restaurants

Many potential buyers can be found among local wholesalers, grocery stores, and restaurants. Most metropolitan areas have produce wholesalers who can be dependable buyers of moderate volumes. Local grocery stores (and even some chain stores) are sometimes willing to buy directly from growers through *direct store deliveries* (DSDs). DSDs are often possible with smaller grocery stores or chains but are discouraged by many larger chains. Most large chain stores want the quality control check that occurs when produce is handled through a regional distribution center. This situation may be changing, however, and growers would be wise to contact supermarket produce managers to discuss marketing possibilities. Many restaurants buy from local or regional wholesalers. However, more and more of them (usually upscale establishments) are promoting locally grown and seasonal items on their menus, so individual growers may be able to sell to them. Like most other forms of produce marketing, restaurant sales are based on good relationships developed over time.

Regional Wholesalers, Chain Store Distribution Centers, Terminal Markets, and Brokers

Marketing to *regional wholesalers* or large *chain store distribution centers* requires consistent quality, often requires significant volumes, and in some cases, year-round supplies. These buyers often have specific and demanding requirements for product uniformity, types of containers, cooling,

transportation, and delivery of fresh produce. Increasingly, grower-shippers are also being asked to supply produce to their supermarket chain buyers with price look-up (PLU) stickers already applied. Larger buyers look for quality and consistency. They need good incentives to interrupt year-round supplies from other parts of the country in order to buy more local produce. Some chain store buyers will pay a premium for top quality local produce.

Terminal markets have significant importance in most major cities over the years, and they offer wide marketing opportunities. These groupings of buyers and brokers may still have the potential to move large volumes of produce, however. These market provide good source of price information for selected cities. The APMCs in Maharashtra are linked with internet and wide are a network for ready information on prices across the market yards in the states as well as main agricultural markets in the country. However, the terminal market is not for the uninitiated, and good long-term relationships between buyers and sellers are critical to success. Consignment sales at terminal markets probably should be the selling option of last resort. Many growers use *brokers* to market produce. They negotiate either purchases or sales of produce on behalf of a buyer or seller. Unlike wholesalers, brokers do not take delivery nor assume ownership (title) of the produce. Brokers usually never see what they are quoting for sale or negotiating to buy. Brokers charge a percentage commission on all sales or a flat rate for each carton of produce sold. The roadside markets are generally heterogeneous and comprehensive but need improvements in terms of infrastructure and other market amenities in many places of the northeastern states. These markets may be handed over to either local governing bodies or self help groups for effective management through participatory process.

Processors

Internationally the consumption and demand for most canned and frozen vegetable products have been increasing. The export market is growing for eco-friendly and organic products. Such F&V products can be processed and canned in the north eastern states by the export oriented units. Much consolidation of production of processing vegetables has occurred in recent years, with most of the industry now located in small and cottage industry sector in the country. There are many traditional vegetable processing units set up in rural sector which perform at low business targets and products thereof are largely unbranded. Several *fresh-cut* processors exist at the cottage scale can operate to serve the domestic markets across the states in the country and most prominently in metros like Calcutta and Delhi which are nearer to the northeastern states. However, the fresh-cut and other forms of processing may represent a significant market for north-eastern states produce in the near future.

Diversity in Vegetable Marketing

Many cooperatives and private organizations are identifying ways to increase the sale of their F&V produce and to promote the attributes of health and freshness of their farm produce. Mention may be made of HOPCOMS, Safal and Fresh brands which are marketing the products on large scale as well as promoting their brand through various tie-up strategies. Several new direct marketing mechanisms have been developed or expanded such as produce auction markets, buying clubs, community farmers' markets, wholesale distribution centers, and marketing cooperatives. The large commercially oriented cooperatives offer labeling designated for fresh produce grown in the villages and provide an organic certification to the products for customer awareness and quality guarantee. Such program for farmers to promote their vegetables as organically grown have also been taken up by these organizations. These organizations have a advertising and promotion program for their retail out lets.

F&V growing farmers have profitable enterprises in tomatoes, pumpkins, cabbage, peppers, and sweet corn, and interest in vegetable production will likely continue to increase. As the market and production segments continue to enhance, many farmers organizations may form partnerships or expand their operation to compete in the wholesale markets. Others may look for opportunities in the local direct sales of produce. While direct marketing can be a way for farmers to keep a larger share of their profit, it may also limit the growth potential in their operation.

Consumers can benefit from the greater selection of fresh produce both at retail and direct market outlets, such as farmers' markets. Typically, these markets have six to ten farmer members in SHGs who sell produce. Members typically meet collectively the marketing costs. Consumers, approach individual growers to purchase a variety of produce ranging from cereals and vegetables. Produce may be sold by weight or by the count. Some markets have special events with activities that promote farm produce, and some offer fresh produce and value-added products such as homemade breads and jams and jellies as is organized by Khadi and Village Industries Commission and Agriculture and Processed Food Export Development Authority in the country.

Buying clubs comprising hotels, institutions, restaurants and service kitchens are one of several new marketing mechanisms for selling fresh produce directly to consumers. A variety of produce may be offered during the season. For example, a typical spring box (For all F&V of the season) includes turnips, beets, cabbage, potatoes, spinach, strawberries, leaf lettuce mixes, radishes, broccoli, peas, and tomatoes. However, weather conditions may affect the availability of some of the produce. The

advantages of the buying club approach is that consumers help share the production costs with the farmer in return for a steady supply of fresh produce during the season. Home delivery can be convenient for time-conscious consumers, and the buying club approach gives farmers a pre-determined, consistent market and customer base. Such marketing approaches through clubs may be promoted by the self help groups and large scale business cooperatives. The National Dairy Development Board can consider implementing the F&V project in the north eastern states alike Delhi in order to promote small cooperatives in the region.

Promotions for Categories of Cooperatives

Generally, there are three types of agricultural cooperatives: marketing, supply and service.

Marketing

Most farmers do not produce enough volume to allow direct business with wholesalers and retailers of their products. Together, through their cooperatives, producers can market their products efficiently and meet consumer demand. Today's cooperatives integrate processing, canning, concentrating, freezing, packaging and storage of dairy, grain, fish, meat, poultry, fruit and vegetable products. The cooperative assists members in meeting market and government standards for their products. Marketing cooperatives assist members maximize the return they receive for goods they produce. Most cooperative marketing activity involves either agricultural products or those of producers in related industries such as forestry, aquaculture and horticulture. New marketing ventures are developing in such diverse industries as handicrafts, professional services and information technology. Some marketing cooperatives limit their activity to negotiating prices and terms of sale with buyers. Growers of fruits and vegetables for processing and dairy farmers are primary users of these cooperatives, called bargaining associations. Other marketing associations assemble member production into large quantities for sale to further processors, wholesalers or retailers. This first-handler role is common for cooperatives of grain growers and producers of fruits and vegetables for the fresh produce market.

Other such associations add further value to member production by processing or manufacturing member products into other, more valuable products. These may serve as ingredients in further processed products or be sold to institutional buyers and restaurants for their direct use, to grocery chains for resale as private label products, or to brand-name companies for resale under their brand.

Cooperatives that process dairy products, fruits, vegetables, grains, fish, and lumber exemplify these value-added processing activities. Still others put member products right on the grocery store shelf under their own brand name. Land O'Lakes, Sunkist, Ocean Spray, Welch, Tree Top and Knouse Foods are examples of cooperatives with established brands. Marketing cooperatives enable members to extend control of their products--and realize additional margins--through processing, distribution and sale.

Supply

Supply cooperatives allow members to pool their resources to buy production supplies including seed, fertilizer, petroleum products, farming equipment, heating oil and hardware for farm businesses. Quantity purchasing realizes savings and assures quality for the cooperative members. These cooperatives frequently affiliate with other cooperatives in the United States and overseas to own phosphate deposits, fertilizer plants, research laboratories, petroleum refineries and other similar facilities cooperatives were first used by farmers to gain access to affordable, quality production supplies such as feed, fuel, fertilizer and seed. These early efforts often became businesses having full-time managers and warehouses to handle other production supplies and services such as farm chemicals, animal health products, fencing, building supplies, construction contracting, automotive accessories, etc. Many local purchasing cooperatives have affiliated with other such organizations, often through regional and national federated cooperatives. These efforts reduce member costs and strengthen their purchasing power through direct ownership of large-scale facilities such as petroleum refineries; phosphate, potash, and nitrogen manufacturing plants; feed mills; research facilities and laboratories. Today many non-farm businesses have developed supply purchasing cooperatives to gain access to the same volume discounts and quality control assurances long available to farmers. These include hardware stores, independent grocery stores and fast food restaurant franchisees

Service

Working in conjunction with other types of agricultural cooperatives, service cooperatives provide specialized programs such as feed mixing, pesticide applications, crop harvesting, artificial breeding and dairy herd improvements for their members. Service cooperatives were also developed to serve farmers. Some of these services are farm-specific, such as recommending and applying fertilizer, lime, or pesticides; animal feed processing; and crop harvesting. Others are general in nature, such as credit through the Farm Credit System, electricity through rural electric cooperatives and communications

service through rural telephone cooperatives. Nonagricultural service cooperatives are also flourishing. Credit unions and the National Cooperative Bank provide credit on a cooperative basis to non-farm individuals and cooperatives. School systems, health care providers, and insurance buyers are among the general public segments making use of service cooperatives.

Unique service cooperatives include:

- The Farm Credit System, owned by its borrowers, providing credit to agricultural producers and their cooperatives, and regulated by an independent governmental agency.
- Rural electric and telephone cooperatives providing electricity and phone service to their members in the rural areas of the United States. These cooperatives were formed when investor-owned utilities were unwilling to serve rural low-density areas.

DIRECT MARKETING ACTION PLAN

Collectively, the plan is designed to enhance small farmers' ability to thrive in their businesses by facilitating the marketing of their agricultural products. Farmer direct marketing, or growers selling their farm products directly to consumers, has been gaining popularity in recent years. Direct marketing includes farmers markets, pick-your-own farms, roadside stands, subscription farming, community-supported agriculture (CSA), and kiosk sales. Farm products sold through direct marketing include fruits, vegetables, nuts, honey, meats, eggs, flowers, plants, herbs, spices, specialty crops, and value-added products such as maple sugar candies, cider, jellies, preserves, canned food, and firewood. Direct marketing is especially beneficial to small farm operators. Nearly 1.9 million farms, or 94 percent of all farms, qualify as small farms. Through this plan, Agricultural Marketing Service(AMS), cooperatives and F&V SHGs will facilitate cooperation and collaboration among agencies and organizations that promote direct marketing and help small farmers benefit from the growing consumer interest in direct marketing. The plan will enable AMS to:

- Identify farmer direct marketing issues and opportunities for small farmers.
- Promote the development and operation of farmers markets and other marketing activities which support small farmers.
- Serve as a one-stop information source for farmer direct marketing activities.

- Conduct, support, and promote research in farmer direct marketing.

As this plan becomes fully implemented, AMS will be able to identify and coordinate solutions to many of the challenges small farmers face in marketing their products. Consumers will benefit through a fresh supply and wide variety of farm-fresh products. Society will benefit from a strengthened bond between grower and consumer, a more sustainable agricultural base, and the continued heritage of the American small farm.

Within 5 years of implementation of this plan, accomplishment of the above objectives may result in:

- Establishing a principal contact at Apex cooperative organizations for information regarding farmer direct marketing.

- Creating new direct marketing networks and identifying and responding to marketing issues affecting small farmers by sponsoring an annual forum of farmers market managers and conducting regional focus groups.

- Establishing a one-stop farmer direct marketing information clearinghouse for handling inquiries and routing calls to appropriate sources.

- Establishing a directory of all active farmers markets, which will be maintained at the website, with a new directory published in July of each year.

- Developing a training program for managers of farmers markets and marketing information programs for small farmers, which will be available electronically or through distance learning facilities.

- Feasibility studies for year-round farmers market facilities.

- Increased participation by limited-resource, women-owned, and/or minority-owned farms in direct marketing.

Women's Organization for Agro-economic Development

A farm women's body may be registered under Companies Act to provide them economic empowerment as well as opportunity for developing the agribusiness sector. This may be set up Village/District Advisory Committees to assist and aid itself in the discharge of duties such as help poor and needy women, particularly in the area of economic development. Accordingly, this organization may take up manufacturing of a number of items, either directly or secures various items prepared by individual women/their village institutions and also markets these products.

The organization may work with the following objectives.

1. To establish and maintain work centres and handicraft centres at various places for the benefit and welfare of women.
2. To establish educational and training projects and schemes to improve the economic and social welfare of women.
3. To develop aid assist initiate promote organise and finance women organisation/bodies engaged in the field of industry, trade, commerce, agriculture, manufacturing, marketing, warehousing and cold-storage.
4. To provide financial assistance in any form whatsoever to women and organisations engaged in the welfare of women for starting, running, expanding, modernising any commercial or industrial activities.
5. To carry on the business of marketing, processing, branding, investigation, market research, storing, warehousing, cold storage, distributing rendering assistance and other services.
6. To acquire from time to time and to manufacture and deal in all such stock-in-trade, goods, channel and effects there of as may be necessary or convenient for any business for the time being carried on by the organization.
7. To establish laboratories for control of the quality of raw materials, intermediates and finished products and to carry out research and investigations to process, improve and invent new and better techniques and methods of making products in which the organizationdeals.
8. To communicate with chambers of commerce and other mercantile and public bodies in India and elsewhere, and concert and promote measures for the protection and advancement of trade, industry and commerce and other facilities.

9. To consider, originate and support improvement in the commercial and other law affecting trade, commerce or manufacture and to promote legislation and other measures affecting such trade, commerce or manufacture.
10. To carry on the business in agricultural production and to purchase, acquire, use and employ any land in agricultural, horticulture, or pastoral use and to carry on the business of general farmers, dairy farmer, orchardists, pastoralists and growers of produce of any description for which the lands may from time to time be found to be most adoptable or suitable.
11. To set up and carry on the business of refining, preparing, buying, selling, importing, exporting, distributing and dealing in all items in which the company deals as stated above.

Institutional Intervention in Agricultural and Horticultural Marketing

Except for commodities whose prices are administered - petroleum, coal, nitrogenous fertilizer - the agricultural commodity markets operate under the normal forces of supply and demand. Regulation and development of agricultural markets, standardization and grading of agricultural commodities, assistance for creation of infrastructural facilities in agricultural produce markets and assistance for setting up of rural godowns are the major activities falling under agricultural marketing. The Government role is limited mainly to protecting the interests of both consumers and producers through farm support policies and promotion of organized marketing of agricultural commodities. Most of the State Governments have also enacted the necessary legislation for regulation of agricultural produce markets. Some of the official organizations and institutions currently engaged in dealing with product and area specific problems having a bearing on production, pricing, and marketing of agricultural products are Commission for Agricultural Costs and Prices (CACP), the Food Corporation of India (FCI), the Cotton Corporation of India (CCI), the Jute Corporation of India (JCI) and the Commodity Boards.

The Central Government has provided assistance for the creation of infrastructural facilities for marketing and also for setting up of rural godowns. A network of cooperatives at the national level, state level and at primary level operates to help farm producers with access and farther reach for sale of produce. National Cooperative Development Corporation (NCDC) is the apex institution which formulates the policy for marketing, storage, production, export and import of agricultural produce

through cooperatives. The National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) is an apex cooperative organisation dealing in distribution, procurement, export and import of selected agricultural commodities. NAFED is a central nodal agency for undertaking price support operations for pulses and oilseeds and market intervention operation for horticultural items like potato, onion, grapes, kinoo/malta, black pepper and red chilli etc. Other organisations in the cooperative sector are the National Cooperative Tobacco Growers' Federation Ltd., the National Consumers' Cooperative Federation and the Tribal Cooperative Marketing Development Federation of India Ltd. (TRIFED) which attends specifically to the marketing problems of the tribal areas.

Table 8.1 Comparing Marketing Options for Fruits and Vegetables

Things to consider	Available Sales Opportunities					
Direct: On-Farm, U-Pick, Farmer's Markets, CSA	**Produce Auctions**	**Marketing Cooperatives**	**Local Wholesalers, Local Grocers, DSDs, or Restaurants**	**Regional Wholesalers, Chain Store Distribution Centers, Terminal Markets, or Brokers**	**Processors or Fresh-Cut**	**Exporters**
Production and Marketing Challenges						
Difficulty getting into the market	Low	Low	Low-medium	Medium	High	Medium-high
Marketing time required	High	Low	Low	Medium-high	Medium	High
Compatible with off-farm employment	Yes	Yes	Somewhat	Somewhat	Difficult	Yes
Importance of product quality (especially shelf life)	Medium	Medium-high	High	Medium-high	High	High
Investments: Time and Money						
Initial commitment level required	Low	Low	Medium-high	High	High	High
Management level required	Low	Low	Medium	High	High	High
Level of service buyers expect from Farmers	Low-high	Low	Low	High	High	High
Initial capital investments required	Low	Low	Medium	Medium-high	High	Variable
Postharvest equipment and facilities investment required	Low	Low	Low	Medium	High	Variable
Income and Potential						
Prices	High	Variable	Medium	Medium-high	Medium	High
Price stability	High	Medium	Medium	Medium	Medium	Low
Product volume required	Low	Low	Medium	Medium	High	Large
Market/sales volume potential	Low-medium	Low-medium	High	Medium	High	High
Potential Growth	Excellent	Good	Good	Good	Fair-good	Low-fair

Table 8

Fruit Crops in N E Region 1996-97
Area in Hectare Production n M T

Fruit crops	category	Assam	Arunachal Pradesh	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
Pineapple	Area	13997	6633	9950	8793	1033	1805	5025
	Production	207838	29922	69650	77202	7154	44170	44470
orange	Area	5895	5566	830		7017	1265	4484
	Production	68527	11842	3320		28068	18031	21000
Other Citrus	Area	7367	2717	965	6961	964		2710
	Production	40639	3981	5888	32980	2787		3520
banana	Area	41337	2645	1410	5370	2814	1505	4927
	Production	595258	9495	10718	63967	14871	23360	33630

Chapter 9

Development of Marketing Infrastructure for Farmers

Immense agro-climatic diversity enables India to grow a large variety of horticulture crops that include fruits, vegetables, flowers, spices and plantation crops. From organized upland tea and coffee plantations to extensive and often dense coastal strips of coconut trees as also the sub-terrain tuber and root crops characterize the variegated nature of the horticultural potential in the country. The country holds the first position in global production of bananas, mangoes, coconut and cashew and is amongst the first ten in citrus, pineapple and apple production. India holds first position in global production of cauliflower and is amongst top ten in production of potato, tomato, onion and green peas.

I. Development of Commercial Horticulture through Production and Post-Harvest Management.

Name of the Scheme/ Project	Components	Pattern of Assistance*
i) Production Related ii) PHM/ Processing related	• High quality commercial horticulture crops • Indigenous crops/produce, herbs • Aromatic & Medicinal Plants • Seed & Nursery • Biotechnology, Tissue Culture • Bio-pesticides • Organic Foods • Primary processing of products • Estt. Of Hort. Health Clinics/ Laboratory(For Agri/Horti unemployed graduates) • Consultancy Services • Bee-keeping. • Grading/ /Washing/Sorting/Drying/ Packing centers • Pre-cooling Unit/Cool Stores • Refer Van/Containers • Sp.Transport Vehicle • Retail Outlets • Auction Plateform • Ripening curing chamber • Market yard/rope ways • Processing unit/ Radiation unit/VHT unit • Hort. Ancilliary industry e.g. tools, equipment, plastics, packaging etc. • Crates, Cartons, Aseptic Packaging& Nets (50% subsidy)	• Back-ended capital subsidy not exceeding 20% of the project cost with a maximum limit of Rs 25 lakh per project. For the North-Eastern/ Tribal/Hilly Areas, maximum limit of subsidy would be Rs 30.00 lakh per project • The subsidy to be released to the leading participating leading Financial Institution on the completion of project as in the case of cold storage projects approved by the Government. • For projects in the cooperative sector funded by NCDC, the subsidy would be through NCDC

***** These schemes are of National Horticultural Board.

Capital Investment Subsidy for construction/expansion/ modernization of cold storage/ storages for horticulture produce

Components and Pattern of Assistance

- Projects upto a capacity of 5000 MT with an average cost of Rs.2 crore (Rs. 4000/MT) would be promoted for wider dispersal, which includes expansion of existing capacity (including CA/M.A. stores/Pre-cooling units).
- In case of modernisation and rehabilitation, subsidy @ 25% of the capital cost will be determined @ Rs. 1000/MT capacity created
- For other storages, subsidy @ 25% of the capital cost is to be determined @ Rs 2000/MT capacity created to be created.
- 25% promoters' contribution
- 50% term loan by banks at PLR+1% through NABARD refinance

- Banks not availing refinance may also finance such projects with the overall operational guidelines of Govt. of India
- 25% back-ended capital investment subsidy by NHB not exceeding Rs 50.00 lakh per project. North-Eastern States, maximum subsidy admissible would be @ 33.1/3/% upto Rs.60.00 lakh.
- The Subsidy would flow from NHB and operated by NABARD, through commercial/cooperative banks, and by NCDC where cooperatives seek loan from NCDC
- Wherever term loans are not raised from institutional sources and the promoters fund projects entirely through internal resource generation, NHB would provide subsidy directly
- The emphasis shall be laid on the following points
- Reducing PHM losses with multi-chamber and multi-product facilities;
- Modern Design/Technology and Energy Saving Equipment's/ Devices to be adopted to avoid obsolescence of machinery, etc.
- Improvement in technology like shifting from Diffuser system to Gravity cooling System/Fincoil system, etc.
- This scheme will be implemented only in those States/UT's/Area which do not control rentals for cold storages.
- The respective Banks/FI's/NCDC/NABARD, etc, will adhere to their own appraisal norms.

BENEFITS:-

- Impetus to the farmers to grow more
- Shelf life of the produce will increase
- Losses shall be reduced
- Consumer shall be able to relish the produce in a "Farm-Fresh" State.

Technology Development and Transfer

• Introduction of New Technologies • Visit of progressive farmers • Experts Services from India/ Abroad • Technology Awareness • Organisation/participation in seminars etc. • Udyan Pandit • Publicity • Observation-cum-study tours abroad • Honorarium to Scientists for effective transfer of technology.	• 100% financial assistance upto Rs 10 lacs/project for production related and upto Rs.25.00 lakh to R&D efforts • 2nd Class Sleeper Rail/ ordinary bus fare and Rs 100/day/farmer for a group of 30 farmers • Actual basis • Upto Rs 50,000/seminar • Upto Rs 3.00 lakh for State, Rs 5.00 lakh for National and Rs 10.00 lakhs International event • Rs 1.50 lakh • On merit • On actual basis • Upto Rs 20,000/- for each expert upto 5 experts/ project

Market Information Service for Horticulture Crops

• Generate information on wholesale prices, arrivals and trends in various markets for horticulture produce and • Dissemination of information through media and publications.	• To assist farmers, Exporters, dealers, research organisation etc.

Establishment of Nutritional Gardens in Rural Areas

• Distribution of fruits plants and vegetable seeds in Minikits • Zero Energy Cool Chambers • Demonstration	• Rs 250/minikit/family • Rs.2500/zero energy cool chamber per school/ village in a panchayat selected for the demonstration • Upto Rs.5000/- per school/panchayat selected for Demonstration

Horticulture Promotion Service

• Techno-Economic Feasibility Studies to review the present status of horticulture development in particular area/state • Identify constraints and suggest remedial measures • Develop short term & loan term strategies • Provide consultancy services and expert services	• Studies through Professional Consultants • 100% financial assistance

Eligible Organisations

The eligible promoters under the above schemes shall include NGO's, Association of Growers, Individuals, Partnership/Proprietary Firms Companies, Corporations, **Cooperatives,** Agricultural Produce Marketing Committees, Marketing Boards/Committees, Municipal Corporations/Committees, Agro-Industries Corporations, SAU's and other concerned R&D organizations. However Individuals, SAU's and other concerned R&D organizations are not eligible for the cold storage capital subsidy scheme

Capital Investment Subsidy Scheme for Construction/Expansion/ Modernization of Cold Storages and Storages for Horticulture Produce.

Nearly one third of our horticultural produce, especially fruits and vegetables are wasted, mainly on account of poor cold storage and other storage facilities. The country also experiences wide fluctuations in prices of horticultural produce, particularly potatoes and onions. The Government of India had, therefore, appointed a High Level Expert Committee in November 1998 for improving the cold storage/other storage capacity for horticultural produce of the country. The Committee has made an assessment that additional cold storage capacity of the order of 12 lakh tonnes would be required. Besides, rehabilitation/renovation of 8 lakh tonnes capacity (approximately), which is lying unutilised in various states especially in U.P, Bihar and Orissa would be necessary. The Committee has also assessed the requirement of storage for onion of 1.5 lakh tonnes on-farm storage in producing areas and 3 lakh tonnes buffer godowns at APMC Yards and terminal markets in different states. The scheme would be implemented by NABARD/NCDC/NHB.

The post-harvest storage and marketing infrastructure is very weak in the north eastern states. This causes tremendous national loss. To overcome this problem, it is proposed to introduce a new credit-linked capital subsidy scheme for construction of cold storages and godowns. This scheme, which will be implemented by the Ministry of Agriculture with the help of NABARD, will help create additional cold storage capacity of 12 lakh tones and will rehabilitate and modernize 8 lakh tones of existing units over the next few years. We also propose to create 4.5 lakh tones of onion storage capacity though out the country and the northeastern states would get the proportionate resources under the scheme.[1]

Outline of the scheme

A new capital investment subsidy scheme for construction/expansion/ modernization of cold storage and storages for horticulture produce is introduced by the Government of India. It would help in minimising post-harvest losses being suffered by farmers, particularly small and marginal farmers. The Scheme would be a part of the ongoing Post Harvest Management (PHM) Scheme of National Horticulture Board (NHB), of which cold storage is one of the components. The projects would also cover the facilities constructed under controlled and modified atmosphere on the same parameters as have been stipulated for construction of cold storages under the scheme.

1. Where cold storage is a subsidiary and small component of an integrated food processing unit and the cold storage facility is meant for captive use for storage of raw material or the processed product.
2. Facilities under the scheme "Food Park".
3. The controlled/modified atmospheric storage systems.

The main features of the scheme are as under :

(a) Eligible Organisations

Cooperatives, Companies, Corporations, Partnership and Proprietary firms, Agricultural Produce Marketing Committees/Boards, Agro-Industries Corporations and Growers' Associations.

[1] NABARD has outlined this scheme. The details of this scheme have been drafted in consultation with the NABARD officials. Such scheme is available with NABARD and can be referred.

(b) Project Cost

The project cost will depend upon the capacity, technology used for cold storage/storages for horticulture produce and will be arrived at on the basis of actuals/estimates of architects/invoice prices of machineries, etc., subject to the norms of appraisal of financing banks/NABARD regarding technical feasibility/ financial viability.

(c) Eligible Institutions for refinance from NABARD

Commercial Banks (CBs), Regional Rural Banks (RRBs), State Co-operative Banks (SCBs), State Co-operative Agricultural and Rural Development Banks (SCARDBs), Agriculture Development Finance Companies (ADFCs) and other institutions that are eligible to obtain refinance assistance from NABARD.

(d) Technical Aspects

Type of Technology

Emphasis shall be laid on the following points :

- Reducing Post Harvest Management (PHM) losses with multi-chamber and multi-product facilities;
- Modern Design/Technology and Energy Saving Equipments/Devices to be adopted to avoid obsolescence of machinery, etc.
- Improvement in technology like shifting from Diffuser system to Gravity Cooling System/Fincoil System, etc.

A back up arrangement of supply of power through diesel generating sets would be necessary for cold storages and it would form part of the capital cost of the project.

(e) Quantum of Subsidy

i) The subsidy will be available only in States/Union Territories/Areas which do not administer or control rentals for cold storages under any statutory or administrative order. In addition, the State Governments

would be advised to carry out market reforms to facilitate access of producers to primary markets, enhance holding and carrying capacity of producers/farmers and introduce measures to ensure transparency in transactions. The scheme should be technically feasible and financially viable.

ii) The office of the Agriculture Marketing Adviser (AMA), Directorate of Marketing & Inspection would continue to pursuade removal of control on rentals in those states where the respective states are still operating their own Cold Storage Control Acts.

iii) AMA will also provide free consultancy support for construction of cold storages and also manpower - training, especially to the North-Eastern States.

(a) New cold storage/expansion of existing cold storage Rs. 4000 per tonne
(b) Modernization/rehabilitation of existing cold storage Rs. 1000 per tonne
(c) Storage for horticulture produce like onion Rs 2000 per tonne

The permissible subsidy calculated as above is subject to a maximum of Rs. 50 lakh per project. However, for the projects in the North-Eastern States, maximum subsidy admissible would be Rs.60 lakh @ 33.33% of the project cost. For calculating subsidy, the capacity of cold storage can be decided by providing a volume of 3.4 cum. per tonne or 120 cft. per tonne of produce.

v) Projects upto 5000 tonnes capacity would be preferred. The banks may sanction projects having cold storage capacity of more than 5000 tonnes on the basis of techno-financial appraisal but the maximum amount of subsidy under these projects would be calculated as per the guidelines at sub paragraph (iv) above and restricted to Rs.50 lakh and in the case of North-Eastern States, the limit of subsidy would be Rs.60 lakh.

(f) Term Loan/Margin Money

(i) The margin money is 25% for the term loan. 50% of the project cost can be raised as term loan from institutional agencies. The eligible amount of subsidy also would be allowed as term loan.

(ii) The value of land to be computed in the project cost should not exceed 10% of the project cost. In other words, in case the cost of the land exceeds 10% of the cost of project, such value to the extent of 10% of the total cost should only be computed in the project cost. The cost of land computed in the

project cost is to be reckoned towards the margin money required to be met by the enterprise. The above is also subject to the following conditions :

1. The cost of the land will be computed in the project cost only when the land is to be purchased by the enterprise.
2. The cost of the land should be the purchase value and not the market value.
3. The value of that portion of the land which is need based for the project only is included.

(g) Rate of Interest to be charged from borrower

Size of Limit	Commercial Banks	RRBs/ADFCs/SCBs/SCARDBs
i) Upto Rs.2 lakh	Not exceeding PLR of the bank	Not exceeding PLR of the convenor bank of the State Level Bankers Committee (SLBC) of the concerned state.
ii) Above Rs.2 lakh	Not exceeding 1% above PLR of the bank	Not exceeding 1% above PLR charged by the convenor Bank of the State Level Bankers Committee (SLBC) of the concerned State.

(h) Rate of Interest on refinance amount to be charged to financing banks : 8.5% p.a.

(i) Quantum of refinance

90% of amount financed to borrower (95% in case of SCARDBs in North-Eastern Region and Sikkim).

(j) Repayment Period

Repayment period will depend upon the cash flow and will be up to 9 years including a grace period of 2 years.

(k) Period of Implementation of Project : 3 Years from the date of implementation of the project.

(l) Other modalities

(i) NABARD would release subsidy to the financing bank on submission of commissioning certificate and the same would be dealt with as provided in sub paragraph (iii) & (iv) below.

(ii) In case the unit has not submitted the commissioning certificate, NABARD would refund the subsidy to NHB.

(iii) Adjustment in Borrowers' Account

The subsidy released by NABARD to the banks on behalf of individual units that are sanctioned assistance will be kept in a separate account. The adjustment of subsidy will be on the pattern of back-ended subsidy. Accordingly, the full project cost including the subsidy amount but excluding the margin money contribution from the beneficiary would be disbursed as loan by the banks. The repayment schedule will be drawn on the loan amount in such a way that the subsidy amount is adjusted after the bank loan portion (excluding subsidy) is liquidated.

(iv) No interest chargeable on subsidy portion

The subsidy admissible to the borrower under the scheme will be kept in the Subsidy Reserve Fund A/c. - borrower-wise in the books of the financing banks. No interest should be applied on this by the bank. In view of this, for the purpose of charging interest on the loan, the subsidy amount should be excluded. The balance lying to the credit of the Subsidy Reserve Fund A/c. will not form part of Demand and Time Liabilities for the purpose of SLR/CRR. Suitable instructions to banks in this regard would be issued by RBI.

(m) Monitoring

- NHB will monitor the progress of this scheme and a proforma for such monitoring would be developed by NABARD for submission of report on quarterly basis.
- Commissioning certificate obtained by the financing banks would be furnished to NABARD for onward transmission to NHB in respect of all such cold storages/storages for which subsidy has been released through NABARD.
- NABARD/NHB monitors the progress regarding construction, operation, etc. of the cold storages/storages from time to time by conducting field visits to the project site along with the representatives from financing bank(s), wherever necessary.
- The progress report of these projects shall be reviewed by the State Level Bankers Committee Meetings**/**District Level Bankers' Committee Meetings.

(n) Physical Outlay

i) Physical programme envisages creation of 12 lakh tonnes capacity of additional cold storage, modernization/rehabilitation of 8 lakh tonnes of cold storage capacity and addition of 4.5 lakh tonnes of

onion storage (1.5 lakh tonnes `on-farm' storage in production areas and 3 lakh tonnes buffer godown at APMC and terminal markets). The scheme would include construction of a 4000 tonnes capacity onion storage with modern technology at a cost of Rs.2.50 crore on a pilot basis which would be implemented by NAFED. The target for the year 1999-2000 is creation of additional cold storage capacity of 3 lakh tonnes, modernisation/rehabilitation of cold storage capacity of 2 lakh tonnes and other storages of the capacity of 1.5 lakh tonnes to be implemented by NABARD/NCDC/ NHB.

ii) Wherever term loans are not raised from institutional sources and the promoters fund projects entirely through internal resource generation, such proposals may be submitted to NHB directly. As regards the projects financed by NCDC the subsidy applications may be submitted to NCDC.

(o) Other terms and conditions:

The usual terms and conditions on which refinance is given to banks continue to be applicable for the above scheme

Identification of problems and opportunities

The ways in which problems can be solved and opportunities exploited will change from area to area. To help the extension officer take a clear overview of the area, he or she will need to identify what stage in horticultural development the region has reached. Normally the aim will be to try to introduce the next steps in horticultural progress.

TABLE 9.1. Analysis of constraints and opportunities

Constraints	Opportunities
Problems	Advantages
No local market. Poor transport services.	Capable of early crop production.
Solutions	Actions
Organize local farmers' market. Encourage buyers with own transport.	Encourage growing early crops and develop production techniques for earlier crops.

To help clarify the extension officer's thinking in analysing constraints and opportunities it can help to use two pieces of paper, as set out in Table 9.1.The best solutions to marketing problems are normally

relatively simple and ought not to require any major changes in production or new technologies. Complex plans or highly innovative plans are much more likely to fail. Three examples are discussed as under:

1. If the area produces but has not before sold horticultural crops then the extension officer should be looking for ways to establish a local market. This might involve, for instance, coordinating growers to assemble their produce on one particular day of the week at a convenient location. Middlemen would be invited to attend the market. The buyers would compete with one another to buy produce so that fair prices should be achieved. As produce is assembled in volume, cheaper bulk transport to the major markets is made possible.

2. If produce is only being sold into a local market there may be opportunities to start supplying more distant, major markets. The extension officer's research should have indicated what the produce requirements, prices and costs are likely to be and identified potential trading partners. He may then want to persuade growers to attempt a test marketing programme to new markets, initially of existing produce and then for new types of produce. If this proves successful then commercially sized shipments could be made. Another option would be for a local representative to take on the role of transporting and selling produce.

3. In an area which is already a major force in horticultural production and marketing the extension officer may concentrate on improving the existing system.. When individual growers already have good links with the market it will be difficult to form producer groups or cooperatives-unless there is some major problem or need. Extension advice is likely to cover generalized advice to groups of growers and specific advice for individual farmers. Potential improvements are likely to be identified at critical points along the production/marketing chain. These may involve anything from new crops and improved production practices to post-harvest techniques, better designed packaging, improved transport methods, better access to credit and production inputs and the establishment of improved market information services.

Finally, it is important to remember that there is always the danger of trying to make changes when they are not necessary. All systems are imperfect inevitably farmers will always complain that they receive

too little money while consumers complain of too high prices. Proposals for change do need to be carefully thought through and any additional costs or disadvantages balanced against the advantages.

Extension techniques

The two chief functions of an extension officer are:

- to reduce the learning time for an individual farmer to accept a new idea or technique;
- to increase the number of farmers who understand the new ideas.

In some countries certain extension officers are given the responsibility of becoming subject matter specialists in marketing. It is then their task to train other extension officers and provide specialist marketing advice. By working through other extension officers their effectiveness is increased. Generally the marketing extension officer is based in the production area. He or she must make regular visits to the markets in order to maintain contacts and keep in touch with changes in price and demand. Sometimes, however, he is based away from the production areas. In this case he will have to return regularly to the production areas to maintain contact with growers' problems and to provide relevant marketing advice.

Experience has shown that one of the most effective ways of working is to work with groups of farmers.

An extension technique, very much under-exploited, is helping farmers indirectly by providing guidance and advice to private-sector companies. For example, companies who either supply inputs or, more importantly, assist in the marketing and distribution of produce can often use timely and reasoned advice to put into motion a process which brings benefits to large numbers of growers. For example:

- if shortages of the required input supplies (e.g. seeds or sprays) are restricting market-oriented production, shops selling agricultural equipment may be persuaded to buy in the necessary materials and even advise growers on their correct use;
- if middlemen or traders can be persuaded that there is a business potential in marketing produce, they can be very effective in establishing workable marketing systems. They can supply seeds and packaging material, give guidance on produce presentation and provide credit for farmers;

- advice and encouragement could be provided to a packaging manufacturer to improve design or use better materials;
- a local transport firm could be assisted to establish a produce collection service.

Leading local farmers strongly influence the decisions of other farmers, e.g. to coordinate their production and marketing. They will generally need to be persuaded of the potential advantages to themselves of improved marketing practices. The extension officer should beware that unless the wealthy farmer is genuinely concerned for the community's welfare he may try to suppress the planned changes. He may do this because he does not want other farmers to become better off. Alternatively, he may see an advantage in carrying out the scheme on his own.

The extension officer may also find it valuable to work with public-sector organizations such as:

- agricultural banks, to improve their credit service to growers;
- farmer cooperatives wishing to undertake input supply and marketing activities;
- research institutes, to ensure they tackle farmers' market-oriented production and post-harvesting problems.

The scope of the work clearly extends far beyond advising farmers. This is because marketing is only as successful as the weakest link in the production/ marketing chain.

Agreeing on an action plan

In this chapter we have considered four potential activities of the extension officer.

The first involves giving advice to an individual farmer. This should be a low priority as it is an inefficient use of time and larger-scale farmers obtain the most benefits.

The second involves providing marketing advice to farmer groups, particularly through the methods of mass extension. This has the advantage of reaching a large number of growers and allows coordination of farmers' activities and cooperation in marketing.

The third technique involves providing advice or information to critical individuals, organizations or private-sector companies in the marketing chain whose actions can have a beneficial effect on marketing.

Finally, and perhaps most ambitiously, an extension officer may decide it is necessary to attempt a project approach to developing horticultural marketing. Marketing is normally achieved by a series of interlinking stages and coordination between the stages is essential. A project approach is one which involves coordinating the activities of a number of different intermediaries in a marketing chain. It may involve a group of farmers assembling their produce at one point so that it can be transported in bulk to the market.

More complex schemes could involve ensuring a supply of inputs, providing growers with production advice and negotiating contract terms with a buyer, be he a food processor or exporter.

As discussed at the start of this chapter, extension officers can have a credibility problem. One way of overcoming this is to achieve a good reputation by successfully resolving some smaller problems. A second way involves securing influential support for the scheme, particularly from farmer leaders or marketing companies. Sometimes them is a reluctance for people to implement someone else's ideas enthusiastically. A clever advisor sometimes overcomes this problem by not revealing his project plans to the individual he considers to be the most important in the scheme. Instead he provides him with the information on the problem and then in discussion leads the individual to come up with the same (or a similar) solution. The individual then thinks it is his own idea and has the enthusiasm and commitment to ensure the plan's implementation.

MARKETING EXTENSION TECHNIQUES

Farmer teaches farmers

A successful farmer explains to a group of farmers his production and marketing practices. The meeting is most effective on the farmer's own farm.

Demonstrations

Practical demonstrations of techniques such as harvesting, cleaning, grading and packing, preferably taking place on a farm. Prepared samples which demonstrate the differences overtime of different handling practices can be effective, as are samples of competing produce and photographs.

Talks and seminars

Possible topics include: market possibilities successful case studies, postharvest techniques, prigs assessment, market-oriented production techniques. Buyers and middlemen should be involved to talk.

Problem-solving techniques

The farmer group is encouraged to identity its own major problems. The problem solving can be tackled systematicaly, by calling In specialists individually to advise the group or by forming a panel to answer farmers' questions. Alternatively, the group might be encouraged to decide their own solutions which they then implement themselves collectively.

Study tours

Farmers are taken on a study tour to make their own contacts and to see the market for themselves, visit processing centres and observe how their produce withstands transportation. Farmers visit farmers in another area to exchange experiences and see new techniques. This experience alone can transform a grower's views on production and marketing.

Written information

Fact sheets are prepared and distributed. These can identity potential trading partners or provide technical information on production and post-harvest techniques.

Market news services

Establishing a market news service which provides regular, reliable, relevant and timely information. This may be in the form of a news sheet or a radio bulletin.

The extension officer's role is then to support the individual, to coordinate the activities of the different parties involved and to chase up the progress of the project. A planned project approach to horticultural marketing development will increase the chances of genuine improvements being made. It is important for the extension officer to have a clear mental image of the desired outcome and successfully

communicate that objective. The project must be understood by all parties, if they are going to be able to work effectively together. Business management experience has shown that targets, such as tonnages to be shipped or selling prices, are important too, as they provide challenges to the parties involved and can be used to monitor the progress of the project. This technique is called management by objectives.

However, no matter how good the preliminary work has been, when a plan is put into action the unexpected will happen. Allowances for the unexpected should be made. It is advisable to start the project with a pilot stage so that mistakes can be made on a small scale and reamed from. Furthermore the project must be flexible so that changes can be made in the light of these lessons. Inevitably the project's critics will try to emphasize any problems; most successful projects will have had to face problems, particularly in the early phases, and their success is often a measure of their ability to learn from and overcome difficulties.

Table –9

Vegetables & Tuber Crops in the N E Region 1997-98

Area in Hectares
Production in M T

Fruit crops	category	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
	Area	4.5	75.3	3.2	20.8	0.7	3.8	4.9
Potato	Production	33.3	671.9	16.9	200.5	3.7	30.7	91.3
	Area		2.5		4	0.5	0.8	
Tapioca	Production		11.7		21.1	7	15.8	
	Area		7.8					0.1
Onion	Production		17.9					0.2

CHAPTER 10

SUMMARY AND RECOMMENDATIONS

General Scenario

The economy of the northeastern states is predominantly agriculture having 77 per cent of the working population engaged in cultivation and the role of agricultural marketing system has considerable importance in the overall economy of the region. It has been found that the in the selected states there are large number of unorganized rural markets and the private traders hold the core agribusiness activities in the region. It shows that a major share of marketable surplus finds its outlet in the poorly equipped markets held periodically in the villages. Most of the transactions in the rural markets involve small quantity of agricultural Produce to purchase the commodities of daily requirements. The private traders, middleman, petty retailers and moneylenders locally known as *Mahajans* dominate these markets.

The bargaining power of the farmers is very weak and, therefore, the traders dictate the price. One of the main reasons for prominence of the traders in the agricultural produce markets in villages is the heavy indebtedness of the farmers to the traders, commission agents and middleman. Besides the organizational and functional dimensions of the marketing system, the flow of commodities in the NE region is restricted and localized to certain specific areas due to geophysical conditions as well as lack of infrastructural facilities. Consequently, the factors of marketing such as pricing, backward and forward linkages, demand and supply of commodities are greatly affected to the disadvantage of both the producers and the consumers. The basic infrastructure facilities include storage and warehousing, road links,

transportation and communication aids. Of these, storage and transportation network performs a significant role in stocking and mobilization of goods. The storage facilities in the region are located mainly at district headquarters and state capitals. Marketing of agricultural commodities in the northeastern states, by and large, is dominated by the private traders due to the absence of proper implementation of market regulation act by the state agricultural marketing boards The state wise problems emerging in the management of rural markets and various functions thereof is detailed in the following text.

Assam

The farm produces in the state pass through a number of channels before reaching the consumer. The farmer gets only a small producer's share in the consumer's rupee. Middlemen at different stages of marketing process have emerged as a powerful channel for the procurement of food grains taking the advantage of the farmer's poor economic condition and weak bargaining power. Thus, the farmer needs protection from such exploitation and also assistance in many respects, more so in a state like Assam where the agriculturists are subject to natural calamities and various other constraints. The village moneylenders advance loans to the cultivators at the time of need making it obligatory on the part of the farmer to deliver their produces after harvest at a price offered by the moneylender. The farmers lose market price significantly due to lack of proper sale arrangements in markets. In addition, farmers do not undertake proper cleaning and grading of the produce before sales, which is also one of the reasons for low price.

The scheme for development of Regulated Market is directly implemented by the Assam State Agricultural Marketing Board, a statutory body constituted under section 3 (1) of the Assam Agricultural Produce Market Act, 1972 (Assam Act XXIII of 1974 with amendment in 1983). The Board is responsible for supervision, control and monitoring activities under the market committees as per the provisions under Act and Rules. The major constraints experienced in the implementation of the Act effectively and development of regulated markets in Assam is the unsettled court

cases filed by the traders of different notified market areas. The markets in Assam are still functioning under the management and control of the municipalities, town committees and *Mahakuma Parishads* and as a result, operation of transaction and enforcement of regulatory provisions have not become effective.

There are many infrastructure problems faced by the farmers in the rural markets. Of many, the rural storage facility is found to be very weak. The farmers are not able to store the cereals, horticultural crops like potatoes, spices, fruits and vegetables for striking a better price deal in the rural markets. The transport is a major bottleneck in the region and due to poor accessibility a large number of farmers carry their produce on head loads. The inadequacy of infrastructure and lack of awareness of the market information has been found as one of the prominent reasons for the distress sales in the village markets or to the itinerant traders. The market information is not effectively disseminated by any of the organization in the and farmers are not largely benefited thereof. The processing of food crops, oilseeds, fruits and vegetables is inadequate in the state. The private sector is also not enterprising in setting-up the processing units in the state for harnessing the surplus fruits and vegetables and oilseeds like mustard.

Meghalaya

Paddy is the main food-crop grown in the state. Maize, wheat, millets and pulses, potato, jute and rnesta, cotton, mustard, ginger, turmeric, areca nut and betel leaf are some of the important cash crops produced in the state. Among the horticultural crops, banana, pineapple, citrus fruits mainly oranges are grown in abundance. There are a number of constraints such as transport, communication, suitable organized marketing set-up, weak cooperative organization, and deteriorating conditions of the primary markets in the rural areas of the state. The private traders have, by and large, monopolized the trade and commerce in the state. Marketing of surplus agricultural produce and other minor forests produce, supply of essential foodstuffs, agricultural inputs etc. are mostly handled by the private traders. The local autonomous administrative bodies are the controlling authorities over these markets including collection of tools and levies without having any control on the

price or quality of the produce sold in the market. The primary markets in the rural areas do not have required facilities of a regular and economic transport. Besides, the market stalls are not properly laid down and are mostly temporary structures made of thatches and bamboo. Basic amenities like godowns or storage facilities, drainage and pavement, parking facilities, supply of drinking water are generally not available in these markets. The farm produce are generally sold without any grading. The traders and the middlemen used to take advantage of the situation by paying lower price for even good quality of produce. As such, the farmers need to be trained for grading of the produce and maintain quality to fetch a better price.

The problerns of marketing of the surplus fruit produce of the border areas of the state needs to be tied up with the fruit processing units under the Department of Agriculture, Meghalaya Cooperative Federation (MECOFED) and other marketing organizations in the State as well as outside the State for the benefit of the growers by utilizing the border tracks as transport links. The fruits and vegetables growers of the state face a number of problems particularly in the rural areas for the disposal of their surplus produce and are deprived of a reasonable price. As such, it is felt that marketing of these commodities may be organized through cooperative organizations/growers organizations etc. for sale in the urban areas by giving transport subsidy. The market regulation in the state is not enforced in many urban and rural markets due to the administrative problems. The markets have not been transferred to the local bodies for the management and control.

Tirpura

In the local context of Tripura, the interaction of the producer - Seller, particularly the small and marginal farmers, is inexplicably linked to the efficient working of rural markets and periodic hats. The rural farmers look up to these markets not only for disposing off their Small Surpluses but also for several other Services including the Supply of their day to day requirements. From the point of helping the disadvantaged group of small farmers a well planned and executed programme of development of rural market and *Haats*, thus, become more relevant for the state.

The increased production on the small farms in Tripura witnessed during recent years demand the development of rural markets. A marginal or small farmer having a little marketable surplus does not find it economically feasible to carry his produce to a distant wholesale assembling market although there are chances of his getting a better price there. The prices prevailing in the rural markets of Tripura are invariably much lower. Price variations are attributed to many reasons such as lack of Storage, transport and marketing facilities at the base market level. Due to lack of transport facilities the farmer is unable to bring his produce to the market. In the absence of the storage & warehousing facilities, the farmer is forced to sell all his produce at harvest time at low prices, only to buy back in off-season at high prices. This highlights the need for Survey and planning of rural markets to enable them to play their role effectively. They can be provided with adequate facilities including warehousing, Storage, etc., at market place especially in the interior tribal belt where the farmer is much deprived of the remunerative price.

Inadequate infrastructure facilities like roads, market yards, etc., discourage the traders' interest in purchasing the agricultural produce and non-farm commodities in these markets. For the same reasons, the procurement agencies of the Government are also unable to make effective purchases. For lack of competition the prices tend to fail or linger at low level. The rural markets should come up to a level, where their prices formation process would promote the off flow of Surplus to and in-flow of Scarce produce from district level. Selling at farm or village level relieves the farmer of botherations of arranging transport, storing, taking it to market to find buyers, etc. The difficulties aggravates when a farmer has a Small marketable surplus to offer. Many a times the farmer is forced to sell owing to financial linkages with the visiting trader.

Sound identification of deficiencies vis-à-vis requirements followed by cost-benefit calculations is necessary. Rural markets are often held in *Jute* lands and *Khas* lands convenient lanes, open space, Shadows of trees etc. With the increase in number of users and the volume traded as well as with change in the trend of handling and trading practices, space, layouts and facilities become important for the Smooth and

efficient functioning of a market and deficiencies in these areas are considered a main foot for bad performance.

The transport bottleneck is prevalent in the state and is being tackled by the local Panchayats by constructing link roads. As per the existing systems markets are developed by the Department of Agriculture, State Government and the same are handed over to the Statutory Market Committees for management and control. Central assistance is also availed of from Directorate of Marketing and Inspection and Department of Rural Development, Government of India both for Regulated and Rural Markets.

Recommendations

The following recommendations have emerged after the study of the rural marketing system in the selected states.

Agriculture Production and Yield

- The agriculture in the northeastern states is the main stay of the economy and is yet to be geared-up commercially. The higher production of cereals, pulses, oilseeds, cash crops and horticulture produce in the region would subsequently lead to higher marketable surplus, larger scope for processing activities and input marketing. There is a need to enhance the agricultural production base, as existing yield levels are no where near the national averages.

- In order to consider the improvement in the agricultural practices in the region, the stasis in the cropping pattern should be broken. It is necessary to explore the possibility of taking farmers from the northeastern region to the other states in western and southern area where farming in the new areas like floriculture, exotic vegetables etc can be studied.

Management of Rural Markets

- The northeastern states like Assam, Meghalaya and Tripura have the legislation for the marketing of agricultural produce but there exist many problems in enforcing the Act in various markets in the states through the regulated market committees. Consequently a large number of rural markets are unorganized and should be brought into regulation in a phased manner.

- The management of rural and apex markets should be handed over to the local bodies elected democratically including cooperatives. Professionally qualified managerial talent should replace the officers on deputation to facilitate long term planning and development of marketing institutions.

Logistics and Infrastructure

- Storage and grading is an important function in the agribusiness and needs to be strengthened in the region. Since the concepts of grading and scientific grading are unheard at the farm level, the apex marketing boards should organize on-farm as well as classroom based training for both farmers and village traders. Focus should be given on retaining traditional bamboo based mat age but at the same time sensitize the farmers to other alternatives like Polypropylene , High Density Polyethylene based materials for storage as well as handling of agricultural produce.

- Most of the existing storage capacity is concentrated in major towns with institutions like State Warehousing Corporations, Marketing Boards and Apex Cooperative Federations which is neither accessible to the farmers nor affordable to them. The efforts should be made on creating rural storage capacity with primary agricultural credit societies and *panchayats*.

- Transportation of agricultural and other rural products has become both expensive and inadequate despite the fact that speed of movement is so vital for

realizing good returns on the perishable horticultural produce. The team does not support the idea of apex marketing boards operating their own fleet of vehicles as the system leads to several managerial problems as noticed in other states. While they may continue to operate refrigerated vans purchased under central schemes of Government of India (GOI), private transporters should be encouraged with adequate credit support though the financial institutions to purchase the light commercial vehicles and operate. To check exploitation of farmers the transport tariff may be fixed from time to time by the respective state governments as is done for passenger transport in major towns and cities.

Processing

- The team recommends two-fold approach for processing of all agricultural and horticultural produce. With respect to the crops like citrus and pineapple all over the northeastern region, large commercially managed economically viable processing units may be encouraged in the private sector. For crops like ginger, papaya, tapioca, areca nut etc. small low cost processing units where even only intermediate value additions is possible, may be encouraged through cooperatives, farmers associations, non-government organizations and autonomous district councils etc. in the region.

Business Linkages

- There is a need for strong horizontal linkages among the unorganized rural markets, regulated markets of apex marketing boards and primary level cooperatives on one hand and the vertical linkages across the national institutions of the GOI, state level marketing organizations and primary level institutions. These linkages should facilitate the flow of market-related information and skills as also resources information on physical infrastructure such as transportation, storage, packaging and other facilities for planning and implementations of government schemes.

- The northeastern region has historically enjoyed good trade relations with the erstwhile East Bengal that continues even today across the Bangladesh border. As agribusiness has fast taken shape in the country, the northeastern states should create export wings in their apex marketing boards, corporations and related marketing organizations to drive home the market advantage that already exists.