

Problem of Horticulture Crops in Assam

(A study in Goalpara District)

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Abstract:

The agriculture sector is the largest and most important sector in almost all the districts of Assam, especially in Goalpara district where till now there are no large scale industries established. Almost 90% of the tribal and minority people in the district are depend on agriculture where no modern technique is used. Again all the items of agriculture sector such as animal husbandry, fishing, horticulture, sericulture, dairy farming are not developed simultaneously. Therefore the development of agriculture sector is very important for upliftment of the economy of Goalpara

In this paper, we have find out the basic problems which are associated with the cultivation of horticulture product in Rangjuli block of Goalpara district. The problems are assigned by Garret ranking technique. After that the suggestions are also given so that this horticulture sector can be developed rapidly in this region. This study also focuses the factors for which people in this region are not interested to cultivate the horticultural product.

Introduction:

The agriculture sector is the largest and most important sector in almost all the districts of Assam. More than 70% of the population in each of the districts are depends upon agriculture. Others are also directly or indirectly related to this sector by trading agricultural product and working agro-based industries. But most important thing is that, the growth of this sector is yet to be developed. Colin Clack attributes the cause of this backwardness and underdevelopment to the high density of agricultural population with low agricultural productivity. Therefore to

solve these problems, a number of effective schemes are introduced so that along with agriculture sector rural economy also developed rapidly. Among these agriculture diversification and building of rural infrastructure would create demands in rural areas for more specialised agro-processing, more sophisticated trading and repair services and more professional education, health and personal service. In this sense production of horticulture crops as diversification of agriculture and as an measure of soil and water conservation leading to increase in production and productivity of crops and sustainable development of the economy.

Horticulture industry based on fruits, vegetables, spices, ornamentals, floriculture, commercial plantation crops, aromatic and medicinal crops can play a pivotal role in diversifying agriculture in terms of production, productivity, providing food assortments, nutrition and has the potential to generate employment for a large number of skilled and relatively less skilled workers on a sustainable basis. It also contributes towards earning of foreign exchange either from fresh produce or processed products (Rasul, 2001).

Goalpara is one of the most underdeveloped district of Assam. It ranks 18th in the Human Development Index amongst the 23 districts of Assam. Its headquarter is the only urban area of the district. The primary sector provides employment to about 75 per cent of its population whereas the share of the secondary and tertiary sectors stands at 5.2 and 19.6 per cent respectively (2001 Census). The number of registered factories in the district stands at 29 in 2000. Thus, though agriculture employs 75 per cent of the population in Goalpara, it has not been able to lead to much economic development of the region. In such a situation, Horticulture is one such activity that can not only increase the income of the people, but can also generate employment opportunities.

The present study tries to find out the basic problems which are associated with the cultivation of horticulture product in Rangjuli block of Goalpara district.

Objectives:

Following are the main objectives of the study:

1. To study what are the problems associated with horticulture crops in the study area.
2. To know the casus of non-adaptation of horticulture crop in the study area.

Research Question:

The appropriate research question relating to these objectives is -Does horticulture involves some problems in study area?

Methodology of the Study:

This part includes following sections:

- Study area
- Sources of data
- Sample size
- Tools of data collection
- Data analysis

Study area:

This study carried out in Goalpara district in Assam. Out of the seven blocks of goalpara, we have considered only one blocks such as Rangjuli. The main reason for considering this

block is- it is cosmopolitan in nature as it includes general, tribal and minority people. Again two villages are taken.

Sources of data:

The study is based on both the primary and the secondary data. Secondary data has been collected from the books, journals and other necessary web pages. Primary data has been collected from the horticulturist in the form of individual and house-hold.

Sample Size: Size of the sample is determined by following formula

$$n = \frac{N}{1+Ne^2}$$

Where, n = size of the sample

N = Total population

E = error term

Here, n= 100. Out of these 100 samples, 50 respondents have been taken from each villages.

Tools of Data collection:

Household survey schedule is used to collect information from respondent at house hold level. To understand the various aspects of the horticulture like land, climate and awareness about the various govt. schemes, Focus Group Discussions were also conducted in village.

Data Analysis:

Data are analyses with the help of Garret ranking technique. Henry E Garret, in his book Statistics in Psychology and Education, explain a technique which is appropriate in our case. At the first step the respondents will be asked to rank the enlisted factors. Enlisted factors are those 10 factors identified in a pilot survey. The orders of merit assigned by the respondents will then be converted in to percentage position using the formula:

$$\text{Percentage position} = 100 \times \frac{(R_{ij}-0.5)}{N_j}$$

Where, R_{ij} is the rank given for the i^{th} factory by j^{th} individual; N_j is the number of factors ranked by the j^{th} individual.

The percentage position of each rank will then be converted in to scores using the Garret and Woodworth (1969) Table. For each factor, the scores of individual's respondents are added. Then the mean scores for all the factors will be arranged in descending order, revealing the importance of various factors.

The data for analyzing the problems faced by the horticulturist has been collected from the respondents involving horticulture in the study area such as production of fruits, vegetables, medicinal plantation etc.

Results and Discussion:

Most of the people in the Rangjuli block are tribal people. They basically involve in the agriculture sector especially in horticultural product like production of fruits such as pineapple,

orange, banana etc. But they face serious problems. Following are the main problems associated with horticulture in the study area.

1. **Limited use of advanced technology:** In the study area, the people who are involved in horticulture are very poor. Therefore they have no advanced on farm agro-techniques and those who applied are not scientific.
2. **Lack of quality planting materials:** Scarcity in the availability of quality planting materials like seeds, fertilizer and plant protection chemicals etc also affects the production of horticulture sector.
3. **Lack of knowledge and skill:** Scientific knowledge and application of integrated nutrient supply, pest and disease control system are also not available in the study area. Which directly reduce the productivity
4. **Non-replacement of old and non-productive orchards:** Since most of the respondents are tribal people, they use the old and non productive orchards
5. **Limited access to modern technique:** In recent time post harvest management is very important for export promotion of horticulture product. But duo to the absence of modern post harvest handling, processing and packaging, the export of horticultural product especially medicinal plant are affected.
6. **Lack of innovative technology:** Lack of application of innovative and new technologies like bio-technology, plasticulture, vermiculture etc to enhance horticulture productivity
7. **Limited scope for research and development work:** Shortage of skilled manpower and insufficient basic infrastructure for R&D work in horticulture directly hamper the growth of horticultural product.
8. **Lack of proper transport system:** Transport and communication is a very effective tool for any production. But in the study area, the transport and communication system is very poor. There is no railways connectivity. Road connectivity is also week.
9. **Lack of financial support:** Finance is very much essential for any type of production. As already mentioned that horticulturist are poor in the study area there is only one bank in Rangjuli block which is far away from the villages, therefore, it is a serious problems for horticulture development in the study area.
10. **Improper market and storage system:** Proper market facility is very important for selling of a product because it directly relates the buyers and sellers. Thus improper market not only reduces the production and productivity but also psychologically affects the horticulturist.

From the above discussion, we find that horticulture in Goalpara faces a number of problems - to identify the major ones, the sample farmers (100) of the study area were asked to list their problems and these problems were ranked following Garret ranking method. The results obtained are shown in the following table.

Sl No	Problems	Rank
1	Improper market and storage system	1st
2	Lack of knowledge and skill:	2nd
3	Lack of financial support	3rd
4	Lack of proper transport system	4th
5	Lack of innovative technology	5th
6	Limited access to modern technique:	5th
7	Limited use of advanced technology: :	6th
8	Non-replacement of old and non-productive orchards:	7th
9	Lack of quality planting materials:	8th
10	Limited scope for research and development work	9th

Source: Computed from Field Data

The table indicates that among the different problems faced by the people practicing horticulture .Improper market and storage system has got the topmost rank. Since due to absence of proper market system and lack of storage production are wiped out and it affects the fluctuation of prices. Lack of knowledge and skill, Lack of financial support, Lack of proper transport system Lack of innovative technolog Limited access to modern technique, Limited use of advanced technolog Non-replacement of old and non-productive orchards, Lack of quality planting material are ranked as 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th & 10th respective levell . Above mentioned problems has been identified as the serious problems by the people practicing sericulture in the study area. All these problems may said to be hindrance for promotion of horticulture in the study area.

Reasons for non-adoption of sericulture:

As already said horticulture has a large potential for employment generation, It also leads to an innovative agriculture technology for the restoration of natural environment and maintenance of ecology. . However, horticulture in the study area has not developed to the desired/ expected level .

The present study tried to identify the reasons why people are not keen on adopting horticulture as an primary occupation. The result based on a sample of (100) is shown in the following table.

Table

Sl no	Problems	Rank
1	Lack of irrigation facilities	1st
2	Lack of proper market	2nd
3	Lack of finance	3rd
4	Non availability of seed, fertilizer etc	4th
5	Lack of knowledge about modern technique	5th

6	Lack of land	6th
7	Shortage of skill labour	7th
8	Lack of training-	8th
9	Non-availability of proper price	9th
10	Uncertainty of production	10th

Source: Computed from Field Data

It is seen from the above table that among the various reasons for non adoption of horticulture in the sample cluster, the top most difficulty is the Lack of irrigation facilities. Due to the uncertainty of returns, most of the people gave up the horticulture although they were engaged in horticulture as their prime occupation. Since Proper market facility is very important for selling of a product therefore it has got the second rank for non-adaption of horticulture in the study area. Again it is known that most of the horticulturists are poor tribal people of the rural areas. Therefore lack of capital has been identified as third rank for non-adaption of horticulture in the study area. Similarly Non availability of seed, fertilizer etc , Lack of knowledge about modern technique Lack of land , Shortage of skill labour Lack of training, Non-availability of proper price, Uncertainty of production - are 4th, 5th, 6th, 7th, 8th, 9th & 10th respectively and the other problems are ranked accordingly.

Suggestions and Conclusion:

Assam possesses good growth potential for horticulture development. For rapid and speedy growth of horticulture, a prospective plan is required. It is very difficult for rapid development of horticulture in Rangjuli unless deterrents and bottle necks for horticulture developments are tackled by appropriate action.

The main limitation for speedy growth from the point of view of horticulturists in the study area are absence of absence of good marketing, infrastructure, weak and absolutely inadequate credit facilities, environmental and climatic hazards. To survive, horticulturists, in the study area, require a minimum floor price for their products and stable price level free from vibrant/quick fluctuations.

Besides these, speedy development of horticulture in the study area also requires integrated programme of development to examine the weak points in the chain of horticulture activities and to strengthen the base of development. Again, the state has to play a vital role to develop the infrastructure and also should monitoring why the existing infrastructure are not fully utilised.

Following are the main suggestions for horticultural development in the study area-

1. Proper land use planning on model basis should be followed along with the due emphasis on optimum use of soil, water and plant resources
2. Application of scientific "on farm" technology package requires due emphasis to remove problems of the availability of planting materials, nutrient supplies and plant protection manners
3. Access to scientific post harvest management techniques to ensure and minimize post harvest loss and receipt of remunerative price to farmers for their crop cultivation

4. Strengthening and creation of regional facilities for research and development, promotion and publicity
5. Due emphasis on export oriented production programme of various horticultural produce fresh and processed products.

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Horticulture in North-East India: Challenges and Prospects

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Abstract

The North-East region offers scope for cultivation of a wide variety of horticultural crops because of its diversities in topography, altitude and climatic conditions. Horticulture is recognized as an important sector for potential diversification and value addition in agriculture. The North-East region is one of the richest reservoirs of genetic variability and diversity of different crops like various kinds of fruits, different vegetables, spices, and ornamental plants, medicinal and aromatic plants. The paper highlights the Challenges and prospects of horticulture crops in North-East India.

Keywords: North-East India, Horticulture crops, Challenges, Prospects

1. Introduction

The term horticulture has been derived from the Latin word. 'Hortus' means garden and 'Cultus' means tilling. It is also generally defined as the sub-division of agriculture dealing in gardening. In other word, we usually understood as the culture of growing garden plants. Horticulture includes the cultivation of medicinal plants, fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds and non-food crops such as grass and ornamental trees and plants. The North Eastern region of India has its own unique combination of living species, habitats and eco-systems that jointly make up its rich diversity resource. The diversity for horticultural crops of the North East region has mainly been managed by local farmers, often women. Apart from the nutritional value, many regional horticultural crops are used for medicinal, industrial, as ornamental plant purposes and income generating source in the rural areas. Rapid growth of horticulture is essential not only to achieve self-reliance but to bring

about the equity in distribution of income and wealth. The horticultural crops are contributing 3.14% of the total geographical area of the North-East region. The region is one of the richest reservoirs of genetic variability and diversity of different horticultural crops, which exist in plant types, morphological and physiological variations, reactions to diseases and pests, adaptability and distribution.

2. Objective

The objective of the study is to highlight the problems and prospects of the horticulture crops in North-East India.

3. Methodology

This descriptive type paper is based on secondary data collected from the various research papers, books and internet.

4. Constraints associated with horticulture of North-East Region

The North-east region has high potential for the development of horticultural crops, but ample of efforts have not been made to develop it as a commercial venture. Constraints associated with horticultural development in the region are as follows:

4.1 Lack of marketing facilities:

Due to lack of marketing facilities in North east India, farmers are getting low return compared to the other parts of India. Except the organized tea industry, almost all the commodities the producers face considerable marketing problems. The producer sells their products at a low price without even getting the opportunity to display them due to thin primary markets. Transportation is the most serious constraints in the horticultural development of North East region.

4.2 Scarcity of trained manpower and extension support:

NE region lagging behind in the efficient extension services whereas the other states of India like Punjab, Himachal Pradesh, Haryana, etc., extension services are very efficient. On the other hand, scarcity of trained manpower and low priority to horticulture in the development plans of states despite high potential are some of the factors responsible for ineffective extension program.

4.3 Low level of formal education and skills:

Education and skills are important for improving farming practices, investment and productivity. It is important for the farmers to have a reasonable level of awareness regarding information on agriculture so that the level of awareness regarding bio-fertilizers, agricultural techniques is increases.

4.4 Financial constraints:

Finance is the major constraints in horticulture crops. Due to the finance problems farmers face difficulties in maintaining warehouse, infrastructure, and transportation or in planting high cost crops. Finance is the problems for high cost crops in plantation and maintenance.

4.5 Lack of research work:

There is a lack of good researches on horticulture and Investments for research on horticulture have always remained low when compared to the large number of crops it covers.

There is lack of adequate work force infrastructure to address the entire problem of horticulture despite of creating department of horticulture in many states.

5. Prospects of horticulture crops in the region

The prospect of the horticulture crops in the North-East region are as follows:

5.1 Industrial uses

There are several important products produced from plants, such as wood, fibers, oils, and rubber. Many of the fibers that are used in textile manufacturing come from cotton. The wood from timber production is used to make furniture, homes and many other products. The demanding plants like bamboo is mostly used in paper industries are founded in this region.

5.2 Medicinal Uses

Different parts of medicinal plants were used in treatment of diseases of different body parts such as bronchitis, bones, skin, ear, stomach, teeth, nose, throat, snake bites etc. In ancient Ayurvedic medical text books it is recommend that quality of water can be increased by boiling it with several locally grown medicinal plants (Unnikrishnan Payyappallimana and Osamu Koike). Increasing demand of fast-growing market of herbal medicines and other herbal healthcare products obtaining from medicinal plants has resulted into trade.

5.3 Orchid as ornamental plant:

Large number of ornamental and flower species are grown wild and semi wild conditions and about 693 species of orchids are flourishing in the North-East region. Economic Uses Orchids are among the most highly prized of ornamental plants.

5.4 Government, Non-Governmental and Research Organizations:

Many state and central government research organizations, universities are now engaged in research, inventory and conservation of diversity in the region.

5.5 Climate condition:

North-East region has potential for horticultural development since the climate condition.

5.6 Production of fruit crops and vegetables

Crops like banana, citrus, pineapple; jackfruit, potato, cassava, sweet potato, ginger, turmeric, large cardamom, coconut and good number of vegetable crops are well adopted in larger parts of the North-East region. Adapting scientific technologies may increase the production of fruit crops. There is ample scope to increase the area under orange, acid lime, guava, jackfruit, plum, peach and walnut etc. Among the fruits mandarins, lemon, banana and pineapple alone constitute more than 2/3rd share for both in area and production. Temperate fruits can be successfully grown in higher altitude of Arunachal Pradesh, Nagaland and Manipur, whereas Shillong plateau is ideal for potato cultivation. Coconut and areca nut which are presently confined to Assam, Tripura and some parts of Meghalaya having sizable area under mango, jackfruit and litchi have to be extended to other nontraditional areas of north eastern region. Papaya is also having good potential in the North-East region.

6. Conclusion:

It can be conclude that the prospect of horticulture crop in North-East region of India is bright. Horticulture crops need priority research attention for increasing the productivity and

quality of the produce. Organic cultivation of crops can pave the way for successful venture. In the North-East region the productivity of vegetables per unit area is much low, hence there is ample scope for adopting modern technology. To bring the horticultural industry back from brink, some bold initiative has to be repeated like introduction of apple in Meghalaya, Nagaland and Arunachal Pradesh, which has taken place in early seventies. Adapting modern technology emerged horticulture as a prominent sector in the near future.

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Export potentiality of Horticultural Products in North-Eastern States (An Analytical Study)

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Introduction:

Diverse agro climatic conditions ranging from the temperate to tropical, fertile soils and abundance of rainfall offer immense scope for development in the horticulture sector of northeastern region of India. The major horticulture crops of the region are potato, onion, sweet potato among vegetables and tuber crops; ginger, turmeric and chillies among spices; banana, pineapple, orange/other citrus fruits, mango, litchi, jackfruit among fruit crops and coconut and areca nut among fruit-nuts. Other horticultural crops, which are produced in the region, are cabbage, brinjal, cauliflower among vegetables; apple, pears, plums/peach and passion fruit among fruit crops.

Total production of fruits in the region is estimated about 23.35 lacs tones, which is only 5.1% of the total production of the country. As regards production of vegetables, the contribution of the region is only 4.5% of the total production in the country. The geo-climatic situation in the region offers excellent scope for growing different horticultural crops including fruits, vegetables, spices, and plantation crops, medicinal and aromatic plants. A wide range of tropical, subtropical and temperate fruits such as banana, Mandarin orange, pineapple, jackfruit, papaya, hatkora (*Citrus microphylla*) etc. and vegetables, both indigenous and exotic, are grown in the region. The high altitudinal places in the region provide good opportunities to grow offseason vegetables, including potato etc. during the rainy season. The region has a huge potential of horticulture development both in terms of market expansion and production growth. The Planning Commission has recommended that the Centre must get together with the States to give a new thrust to horticulture and vegetable gardening. This will include everything from plant breeding and tissue culture propagation, demonstration, training of manpower, including barefoot extension agents to post-harvest technology, marketing, cold storage, processing and pricing. The North Eastern Region has the potential to be a major player in the emerging South East Asian Markets in view of its close proximity to those markets.

Objectives:

1. To assess the exportable surplus quantities of horticulture products in the North Eastern States.
2. To estimate the resource requirement for providing support in terms of transport assistance for exporting these products.
3. To identify various potential international markets for exporting these products.

Methodology of the study:

To prepare the proposed paper, basically the secondary sources of data are used like books, Journal and internet scanning was also under taken to collect relevant data. Data are taken from various sources, informations such as APEDA, CMI, Social Reseach centre and other sources.

Major Horticultural Products of Northeastern India (in MT)

Northeastern Region has excellent scope of export promotion of horticulture produces. Almost all the States have huge surplus quantities available and a few of them are also being exported to neighbouring countries like Bangladesh and Myanmar. The production of major horticulture crops in all the Northeastern States is provided at Table below.

Commodity	A.Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura	Total
Citrus/Orange	27251	142000	12987	36805	21967	12500	8350	17044	278904
Banana	14817	581000	15308	67779	8059	5000	-	69330	761793
Pineapple	36310	199000	79889	92036	2456	24800	-	105086	539577
Papaya	-	99000	21282	4484	821	672	-	9633	135892
Jackfruit	-	170000	3137	-	1065	-	-	254945	429147
Ginger	36666	116000	12524	47138	29582	-	24710	2774	279394
Turmeric	-	8000	4092	9242	2258	-	1735	3751	29078
Potato	-	543000	-	160757	-	1750	32612	93472	831591
Chillies	-	10000	29296	1193	2307	-	-	16279	59075

Source: APEDA report.

From the table it is observed that Citrus/orange is largely produced in Assam amounting of 1, 42,000 metric tones and followed by Meghalaya amounting of 36,805 metric tones. Lowest citrus fruits are produced in Sikkim with 8,350 metric tones. The total production of citrus fruits in Northeastern region is 2, 78,904 metric tones.

Banana, highest produces in Assam (5, 81000 mts.) followed by Tripura (69,330 mts.) and lowest production is in Nagaland and there is no production of banana in Sikkim. The total production of banana in the Northeastern states is 7, 61,293 metric tones.

Pineapple is highly produced in Assam, amounting 1, 99,000 metric tones and second place is occupied by Tripura with 1, 05,086 metric tones, lowest in Mizoram (2456 mts.) and there is almost no production of pineapple in Sikkim. The total production of pineapple in the northeast region is 53, 9,577 metric tones.

Among the northeastern states, highest production of papaya is produced in Assam with 99,000 metric tones and 2nd place is occupied by Manipur with 21,281 metric tones and lowest production of papaya among the northeastern states is Mizoram. There is almost no production of papaya in Arunachal Pradesh and Sikkim.

Among the northeastern states highest jackfruits are produced in Tripura amounting of 2, 54,945 metric tones and 2nd place occupies by Assam with 170,000 metric tones. Total production of jackfruits in northeastern region is 4, 29,147 metric tones.

Highest turmeric is produced in Meghalaya with 9242 mts. And followed by Assam with an amount of 8000 metric tones and lowest production of turmeric is in Sikkim with 1735 metric tones. Total potato production in the northeastern states is 8, 31,591 metric tones, where Assam produces the highest amount of 5, 43,000 metric tones and followed by Meghalaya with 1, 60,757 metric tones. Total 59,075 metric tones of chillies produces in the northeastern states, where the highest production of chillies supplies in Manipur (16,279 mts) and followed by Tripura.

Surplus Quantities of Horticultural Products in the North-Eastern States (in MT)

After local consumption and average post- harvest crops loss of 30% in case of fruits, the following table shows the net surplus quantities of horticulture crops of the northeastern states of India.

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

Source: APEDA report.

It is observed from the table that the total Citrus fruit 74,564 metric tones is surplus in the northeastern states, where highest 23,000 metric tones surplus quantities comes from Meghalaya followed by Arunachal Pradesh (18,702 mts) and Assam by 12,000 metric tones. Total surplus quantities of banana in northeastern states of India is 96,368 metric tones, the highest quantities of surplus banana produces in Assam with 85,000 metric tones and next place is occupied by Arunachal Pradesh with 10,168 metric tones. It is observed from the table that Manipur, Meghalaya, Nagaland, Sikkim and Tripura have no any surplus quantities of banana after local consumption to export. On the other hand, total surplus and exportable quantities of pineapples from the NER is 1, 84,319 metric tones, whereas Meghalaya supplies the highest quantities of pineapples with 70,000 metric tones, followed by Tripura and Assam with 31,000 metric tones and 29,000 metric tones respectively. Total surplus quantities of Papaya from the northeastern states are 20,320 metric tones. These surplus quantities are produced only in Assam and Manipur with 15,000 metric tones and 5,320 metric tones respectively. The surplus quantities of jackfruits observe in Assam and Tripura only. Except Nagaland, every states of northeast produce surplus quantities of Ginger.

The highest quantities of various horticulture products produces in Assam with 2, 08,000 metric tones and next place occupied by Arunachal Pradesh with 78,952 metric tones. The total surplus quantities which can be exported to other places or countries is 8, 40,923 metric tones.

Export potential of Horticulture Produces in the International Markets:

The horticultural Crops are considered a better option for diversification of agriculture due to higher returns available from them. It also helps in improving productivity of land, generating employment, improving economic conditions of the farmers and entrepreneurs. In developed countries the growing concern for health and nutrition has caused consumer preferences to shift from high-fat, high-cholesterol foods, such as fish to horticultural products, especially from the countries like India. But India is unable to reach the sufficient markets because there are no regulated markets and the trade moves around the private traders who procure the produces at local markets in the village areas of the NER, Some traders from Assam are procuring mandarin orange and exporting them to Bangladesh. It is also reported that good qualities of Ginger is also being sold outside, however, no organized market information system is in place to assess the quality and price of such transaction taking place.

There is high demand of fruits like orange in the countries like UAE, Saudi Arabia, Bangladesh and EU countries. The demand of fresh and processed Banana has in the countries like UAE, UK, Saudi Arabia, Sri Lanka and Singapore.

Transport system in the NER:

The inadequate transport facilities and the difficult terrain are the major reason for the very low level of export of horticulture products in the Northeastern states. There are a number of national highways in the region connecting the states capitals and state highways and other roads connecting the district headquarters and towns. However, the condition of these roads is very poor and gets worsen even during the monsoon seasons.

The status of road network in the Northeastern states has been shown in the following table.

Road Network in the NER

States	Total length (in Km)	Surfaced roads(in Km)	Unsurfaced roads(inKm)	% of surfaced roads
Arunachal Pradesh	18,365	5,689	12,676	30.97%
Assam	89,486	12,882	76,604	14.40%
Manipur	11434	3,863	7,571	33.78%
Meghalaya	9565	6,560	3,005	68.58%
Mizoram	5075	2,877	2,198	56.69%
Nagaland	21021	6,451	14,570	30.69%
Sikkim	2019	1,546	473	76.57%
Tripura	16296	4,393	11,903	26.96%

Source: Basic Road Statistics, Dept. of Road Transport and high ways, GOI

The railway network in the Northeastern states is also very poor and majority of the areas are not connected in these states. The railway network in the NER has been shown in the table.

Railway Network in the NER

States	Broad gauge	Meter gauge	Narrow gauge	Total gauge
A.Pradesh	0	1.27	0	1.27
Assam	902.94	1470.58	0	2373.52
Manipur	0	1.35	0	1.35
Meghalaya	0	0	0	0
Mizoram	0	1.50	0	1.50
Nagaland	7.63	5.22	0	12.85
Sikkim	0	0	0	0
Tripura	0	44.72	0	44.72

Source: NEDFI Data Bank.

The status of air facilities in this region is very poor. The L.G. B international airport at Guwahati has commenced some international flights however, they only link to the far Eastern countries and are not any help for the export promotion of horticulture produces. Very small Cargo space is available in the domestic flights connecting to the major cities like Delhi and Mumbai. The other domestic airports in the region are at Imphal, Dimapur, Tezpur, Jorhat, Dibrugarh, Lilabari, Silchar and Agartala etc. However, the capacities to carry Cargo are minimal on this sector and are not of much use to the horticulture exports. The other nearest airport with international connection is the Kolkata airport. However, the connection is again largely to Eastern countries, which do not have the desired market potential for the products of NER.

Support structure for Export Promotion:

The promotion of exports of horticulture products from the northeast region requires a major support in building the necessary infra-structure and support systems. The existing infra-

structure for the development of horticulture is highly inadequate in many ways. The technological base and limited market infrastructure with no storage facilities and inadequate means of transport have resulted in a very low or even no growth in this sector. The role played by the Government Department is highly inadequate. Owing to many other problems like insurgency and political instability, the growth of private sector in this area has also been very poor. The existing players in the market are mostly the age-old traders, who lack the long-term vision and are exploiting the farmers for meager gains. The Northeastern states can become a key centre for production of a variety of fruits and vegetables and as a major supplier of this product to the international markets. The location of these states, having extensive international border also provides remarkable opportunities for border trade and export to the neighbouring countries.

Major findings of the Study:

- 1) It is observed from the analysis that the NER has huge surplus quantities available of horticulture products to market in the other states and for exports to the international markets.
- 2) The major export-potential crops in this region are Citrus (orange), Banana, Pineapples, Papaya, jackfruits, ginger and Turmeric etc
- 3) The promotion of export of horticulture products from the NER requires a major support in building the necessary infra-structure and support systems. The existing infrastructure for the development of horticulture is highly inadequate in many ways.
- 4) There is an inadequate transport facility like road network, rail networks and air network in this region.
- 5) The markets of horticulture products in the region are largely unorganized and dominated by the private traders.
- 6) The processing capacity is developed on the potential of supply of raw materials of these areas; however, despite of huge surpluses available in the region, the development of processing industry has been negligible in these states.

Recommendations:

1. At present there are no pre-cooling or cooling facilities for the produces of the Region. In order to exploit the potential of horticultural exports, an efficient cold chain needs to be developed.
2. Proper packaging and presentation is critical for success in the export market of high value horticulture crops. Good quality of packaging material and local sources of supply needs to be provided to the Region for promoting the exports of horticultural products.
3. For any agriculture based activity, supplies such as planting materials, fertilizers, pesticides and other farm equipments are to be made available to the farmers and the concerned State Governments need to be sensitized for taking up this in a big way.,
4. Many agencies/departments of the Governments such as NEDFI, NABARD, NHB, Ministry of Agriculture, Govt. of India and State Governments need to offer financial assistance in the form of loans, subsidies. participation for taking up projects for promotion of Horticulture in the NER.
5. Air transport system is to start to export these horticulture products to the other countries like UAE, Saudi Arabia, where there is huge demand of these products.

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