

## HORTICULTURE SCENARIO IN NE REGION OF INDIA

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### ABSTRACT

*There Is Immense Potential For Vertical And Horizontal Growth In Horticulture Sector In The Region. At Present Horticultural Crops Account for Only 18.60% of Cultivated Area. This Share Is Highest In Sikkim Followed By Manipur, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Assam And Nagaland. There Is Need To Expand Area Under Horticultural Crops Particularly In Assam, Mizoram And Nagaland Where At Present It Is Less Than 20% of The Cultivated Area. In Terms Of Its Contribution To The National Production, The Region Accounts For About 5.1% Fruits And 4.5% For Vegetables. Organized Cultivation Of Crops Like Kiwi, Passion Fruit, Off Season Vegetables, Anthurium, Cut Flowers (Rose), Patchouli, Geranium Etc. Has Stared In Recent Years.*

**KEYWORDS:** Arunachal Pradesh, Meghalaya, Tripura, Anthurium

**Received:** Jan 23, 2017; **Accepted:** Mar 02, 2017; **Published:** Mar 08, 2017; **Paper Id.:** IJASRAPR201734

### INTRODUCTION

The economy of the North Eastern states is mainly rural and agrarian. The region offers scope for cultivation of a wide variety of agricultural crops because of its diversities in topography, altitude and climatic conditions. The extent of cultivable land in the NE region varies from state to state. Land is a critical resource in many of the NE states, and availability and management of land for agricultural activities are essential for raising the region's overall agricultural production and productivity. The region's agricultural system is predominantly traditional. The overall geographical land to man ratio for the NE region (0.67 hectare/person) is much higher than the national average (0.32 hectare/person). Population to land ratio is highest highest in Arunachal Pradesh followed by Mizoram, Sikkim and Manipur.

The per cent utilization of cultivable area in the NE regions (62.04%) less than the national average (73.05%). About 80% of the farmers in the NE region belong to small (less than 1.44ha) and marginal (less than 0.40 ha) category. Moreover, with increase in population, the average size of land holding is gradually reducing over the years. This is primarily because hilly terrain constitutes nearly two third of the regions geographical area, and large sized holding are not feasible. The average size of land holding for the NE States (1.60 ha) is marginally higher than the all India (1.57 ha). Among the NE States the average size of land holding is highest in Nagaland (6.92 ha) and lowest in Tripura (0.97ha). The average plot size is very small for mechanization of agriculture and adoption of modern farming practices. Hence, high value crops such as different types of flowers will provide high remuneration from limited resources.

There is immense potential for vertical and horizontal growth in horticulture sector in the region. At present horticultural crops account for only 18.60% of cultivated area. This share is highest in Sikkim followed by Manipur, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Assam and Nagaland. There is need to expand area under horticultural crops particularly in Assam, Mizoram and Nagaland where at present it is less than 20% of the

cultivated area. In terms of its contribution to the national production, the Region accounts for about 5.1% (fruits) and 4.5% for vegetables. The major horticultural crops of the Region are depicted in Table 1.

**Table 1: Percent Area under Horticulture Production**

State/UT's	% Area Under Horticulture
Arunachal Pradesh	36.26
Assam	15.49
Manipur	37.05
Meghalaya	30.44
Mizoram	16.99
Nagaland	4.66
Sikkim	50.92
Tripura	27.52
Total	18.66

Source: Directorate of Economics and Statistics & National Horticulture Board

**Table 2: Major Horticultural Crops of NE Region**

State	Fruits	Vegetables	Spices	Others
Arunachal Pradesh	Apple, orange, kiwi	Potato, tomato, cabbage	Ginger, Turmeric, Cardamom (Large)	Medicinal Plants and Herbs, Flowers/Orchid
Assam	Banana, Orange, Pineapple, Arecanut, Coconut, Assam Lemon	Potato, Cauliflower, Cabbage and Other Summer Vegetables	Ginger, Turmeric	Medicinal Plants and Herbs, Flowers
Manipur	Pineapple, Papaya, Banana, Lemon, Orange, Passion Fruit	Potato, Cauliflower, Pea, Tomato	Chili, Turmeric	Medicinal Plants and Herbs, Flowers
Meghalaya	Pineapple, Banana, Orange, Passion Fruit, Strawberry	Cabbage, Chow-chow	Ginger, Chili	Medicinal Plants and Herbs, Flowers
Mizoram	Orange, Banana, Papaya, Grapes, Passion Fruit	Potato, Squash, Cabbage, Broccoli	Ginger, Chili	Flowers/Orchid, Medicinal Plants and Herbs
Nagaland	Pineapple, Banana, Orange, Passion Fruit	Tapioca, Cucumber	Chili, Ginger, Large Cardamom	Medicinal Plants and Herbs
Sikkim	Orange, Passion Fruit, Kiwi fruit	Cabbage, Cauliflower, Broccoli, Potato, Off-season vegetables	Large Cardamom, Ginger	Medicinal Plants and Herbs, Flowers/orchids
Tripura	Pineapple, Banana, Litchi, Jackfruit, Mangoes	Potato, Off-season vegetables	Ginger	Medicinal Plants and Herbs, Flowers

Based on altitude, rainfall pattern, temperature variation, topography, soil etc, the region has been divided into six distinct agroclimatic zones excluding Assam.

- Alpine zone
- Temperate and Sub alpine zone
- Subtropical Hill zone
- Subtropical Plain Zone
- Mild Tropical Hill Zone
- Mild Tropical Plain Zone

Characteristic physical features, area coverage and important horticultural crops of all six agroclimatic zones are given in Table 2.

**Table 3: Agro Climatic Zones of NEH Region**

Zones	Physical Features	Important Areas	Horticultural Crops
<b>1. Alpine Zone (&gt;3500 m)</b>	Area: 47068 km <sup>2</sup> Rainfall: 750 mm Mean Temperature: Maximum: 17°C Minimum: 2°C	<b>Arunachal Pradesh:</b> Gorichen, Upper Tawang, Tulungla, Bumla, Sela pass areas of West Kameng District, Jidu and adjoining areas of Northern Siang <b>Sikkim:</b> Gnathong, Chhangu, Serrathong, Thangu, Yakthan, ZemaLachen, eegyathathang, Samsingeling, Cholemu, Lima, Nathula range.	Wild strawberries,
<b>2. Temperate Sub-Alpine Zone (1500 – 3500 m)</b>	Area: 33564 km <sup>2</sup> Rainfall: 2000 mm Mean Temperature: Maximum: 20°C Minimum: 11°C	<b>Arunachal Pradesh:</b> Tawang, Dirang, Bomdila, Shergaon, areas of West Kameng district, Dibang Valley, Northern part of East Siang, Upper Subansiri district, part of west Siang around Anini and North Eastern part of Lohit district. <b>Meghalaya:</b> Upper Shillong, Mawphlang and Mairang of East Khasi Hills district <b>Manipur:</b> Mao & Maram areas of North district, Ukul and adjoining areas of East district, Laithang areas of Central district. <b>Sikkim:</b> Karponang, Bordong, Resi, Kangdin, Melli, Param, Lachen, Laichung, Hilley, Yoksum. <b>Mizoram:</b> Blue mountain, Halikhan, Tuipang, Nauzuarzo Tiang <b>Nagaland:</b> Tuensang and Zunhoeboto district, Vangkong area of Wokha district, higher areas of Mokokchung district.	Apple, pear, peach, plum, walnut, kiwi fruit, potato, cole crops, root crops, solanaceous vegetables, pea and beans.
<b>3. Sub-tropical Hill Zone (1000 – 1500 m)</b>	Area: 29021 km <sup>2</sup> Rainfall: 2000 mm Mean Temperature: Maximum: 30°C Minimum: 12°C	<b>Arunachal Pradesh:</b> Changyak, Naga and Khonsa area of Tirap district, Basar area of West Siang district <b>Meghalaya:</b> Jowai sub-division of Jaintia Hills, part of Nongstoin sub-division, Nokrek and Kailash area of West Garo hills and Western part of East Garo Hills. <b>Sikkim:</b> Namchi, Gayzing, Rongli, Rehnok, Mangan, Changthang, Uttre, Gangtok. <b>Mizoram:</b> Whole state except lower valleys of Northern and Western part and area adjoining Cachar district and lower parts of Chhimtuipuii	Citrus, kiwi, passion fruit, strawberry, pineapple, plums, pears, all cruciferous and solanaceous vegetables, peas, French bean, sweet potato, potato, ginger, gladiolus, orchid, carnation and live plants.

		district. <b>Nagaland:</b> Mokokchang district, lower parts of Kohima, Wokha district and Mon district.	
<b>4. Sub-tropical Plain Zone (400-1000 m)</b>	Area: 812 km <sup>2</sup> Rainfall: 1600 mm Mean Temperature: Maximum: 27°C Minimum: 10°C	<b>Manipur:</b> Imphal Valley <b>Nagaland:</b> Bhaghti&Longnak valley <b>Meghalaya:</b> Umkiang area of Jaintia hills.	Mango, lemon, guava, banana, strawberry, passion fruit, winged bean, <i>Perkiaroxburghii</i> , broad bean and common vegetables, orchids, anthurium and gerbera.
<b>5. Mild Tropical Hill Zone (200-800 m)</b>	Area: 26349 km <sup>2</sup> Rainfall: 1400 mm Mean Temperature: Maximum: 30°C Minimum: 12°C	<b>Arunachal Pradesh:</b> Southern part of lower Subansiri district. <b>Meghalaya:</b> Southern part of Jowai sub-division adjoining Karimganj, Cachar and North Cachar district of Assam, Southern part of Nongpoh sub-division of Ri-Bhoi district, eastern part of east Garo hills and West Khasi Hills. <b>Manipur:</b> Manipur West district including Juibam area of Churachandpur and Thanlon of South district Morena area of Central district. <b>Sikkim:</b> Rongpoh -East district <b>Mizoram:</b> Lower valley of Northern and Western parts and Chhimituipuii district. <b>Tripura:</b> Jampui Hills <b>Nagaland:</b> Medziphema area of Dimapur sub-division.	Pineapple, mandarin, banana, papaya, litchi, arecanut, coconut, black pepper, coffee, brinjal, tomato, okra, beans, sweet potato, rose and orchids.
<b>6. Mild Tropical Plain Zone (0-200 m)</b>	Area: 29333 km <sup>2</sup> Rainfall: 2000 mm Mean Temperature: Maximum: 33°C Minimum: 17°C	<b>Arunachal Pradesh:</b> Pasighat area, Singphow area of Tirap district and lower parts of Lohit district. <b>Meghalaya:</b> Lower part of West Garo Hills district <b>Mizoram:</b> Parts of adjoining Cachar district of Assam and North Tripura district <b>Tripura:</b> Major part of Tripura excepting Jampui Hills <b>Nagaland:</b> Southern part of Dimapur sub-division excluding Medziphema area.	Pineapple, litchi, mango, banana, jackfruit, citrus, cashewnut, betel leaf, arecanut, black pepper, coconut, tea, coffee, cucurbits, beans, brinjal, sweet potato, potato, gerbera, tuberose and chrysanthemum

Organized cultivation of crops like kiwi, passion fruit, off season vegetables, anthurium, cut flowers (Rose), patchouli, geranium etc. has started in recent years. While food grains are grown in the valleys (plain and gentle slopes), horticulture crops are cultivated on higher hill slopes. Considerable diversity exists among the regional horticultural species including variation in plant type, morphological and physiological characteristics, reactions to diseases and pest adaptability and distribution. In addition to their nutrition value, many regional horticultural crops are also used for medicinal purposes. The diversity of major crops in NER is recorded as:

Taro - 300 species

Yams - 200 species

Citrus - 17 species

Banana - 16 species and 120 variants

Medicinal Aromatic Plants and Herbs - 306 species

The Mission's estimates of area and production by 2011-12 are shown in Table 3 below:

**Table 4: Area and Production of Fruits and Vegetable Crops in NE Region (2011-12)**

State	Fruits		Vegetables	
	Area ('000 ha)	Production ('000MT)	Area ('000 ha)	Production ('000MT)
Arunachal Pradesh	89.27	192.26	34.12	227.63
Assam	188.64	2539.94	346.11	7518.88
Manipur	92.77	687.94	23.09	244.00
Meghalaya	50.63	462.40	79.02	806.00
Mizoram	36.70	90.78	13.27	84.76
Nagaland	23.23	227.62	28.43	273.86
Sikkim	17.33	26.90	34.22	246.06
Tripura	64.61	895.29	57.12	954.11

The annual linear rates of growth in area and production of horticultural crops in the region work out as below, with considerable variations across the States:

**Table 5: Annual Growth Rate Percent**

	Area	Production
<b>Fruits</b>	<b>9.7</b>	<b>11.2</b>
<b>Vegetables</b>	<b>8.8</b>	<b>14.8</b>

#### Lesser Known Fruit Crops of NEH Region

##### Meghalaya

*Prunusnepalensis*, *Citrus indica*, *Myricanagi*, *Eleagnus khasianum*, *Flemingiavestits*, *Docynia indicakhasiana*, *Citrus macroptera*, *Citrus latipes*.

##### Assam

*Citrus lemon*, *C. jambhiri*, *C. megaloxycarpa*, *C. assmensis*, *Artocarpus lakoocha*, *Dillenia indica*, *Averrhoecarambola*.

##### Nagaland

*Citrus ichangensis*, *C. aurantium*, *Musa magnesium*, *Malus baccata*.

##### Sikkim

*Musa sikkimensis*, *Baccaureasapida*, *Docynia indica*

##### Tripura

*Psidium guineense*, *Zizyphus mauritiana*, *Citrus megaloxycarpa*, *Phyllanthus acidus*, *Flacourtia indica*, *Baccaureasapida*, *Averrhoecarambola*

##### Arunachal Pradesh

*Gariciniacowa*, *Baccaureasapida*, *Citrus medica*, *Sterculia hamiltonii*, *Actinidiachinensis*, *Mangifera sylvatica*, *M. chassina*, *Musa ornata*, *Musa velutina*, *Nepheleumlappaceum*, *Lithocarpus spp.*, *Castanopsis indica*, *Fragaria spp.*

### Wild Edible Vegetable of NEH Region

*Chenopodium spp.*, *Rhynchochumelliptium*, *Houttuyniacordata*, *Clerodendrumcolebroekianum*, *Erygiumfoetidum*, *Parkiaroxburghii*, *Momordicacochinchinensis*, *Momordicadioica*, *Sechiumedule*, *Vignavexillata*, *Solanumdepressum*, *Solanumseperintinum*, *Psophocarpustetragonolobus*, *Allium hookerii*.

### High Potential Medicinal Plants of NE Region

*Panaxsuedoxinseng* - AIDS

*Hydnocarpuscurzii* \_ Leprosy

*Litseaacubeba* – Paralysis

*Clerodendrumcolebrookianum*– Heart disease

*Coptisteeta* – Malaria

*Vitextrifolia* – tuberculosis

*Aconitum heterophyllum* – Diabetes and rheumatism

*Alpinialangala* – Skin disease

*Cucurmacaesia* – Swellings, sprains

*Taxusbaccata* – Breast cancer

*Acoruscalamus*– Influenza, headache, cough, cold

*Ambrosia artemisifolia* – wounds, cuts

*Antidesmabrunius*– syphilitic ulcers

*Achyranthesaspera* – leprosy

### Horticultural Crops Used in NTFP

- Fibre: Okra, pineapple, snake plant, banana
- Fodder: *Artocarpuslakoocha*, *Prunuscerasoides*, *Ficushookerii*
- Dyes: *Cucurma*, *Myricanagi*, *Garciniacowa*
- Essential oils: *Alpinia*, *Cinnamomum*, *Cymbopogon*, *Ocimum*, *Pogostemon*, *Vanilla*
- Phytochemicals: Olive, citrus, coconut, pineapple, papaya, jackfruit, apple.

### Technological Interventions

Concerted research efforts have been made by research institute to identify a large number of improved varieties and production technologies of fruits, vegetables, tubercrops including potato and plantation crops suitable for the region.

## Fruit Crops

Based on the survey conducted in Meghalaya, Arunachal Pradesh, Mizoram, Sikkim and Assam, a large number of citrus species were collected and analyzed for physiochemical characteristics. Suitable rootstocks for grafting and budding of different types of citrus have been identified. Varieties of different fruit crops like guava, peach, passion fruit, kiwi, strawberry, banana, pineapple, litchi, mango, papaya etc. have been identified.

Citrus: Khasi mandarin, Assam lemon, Acid lime, Sweet orange.

Peach: TA 170, Floridasun, Shan-e-Punjab, Sharbati.

Plum: Santarosa, Alton, Titrok

Pear: Bartlett, Baghughosa, Sand Pear, Patharnakh Red

Apple: Royal Delicious, Rich-a-Red, Red Delicious, Golden Delicious

Kiwi: Bruno, Allison, Abbot, and Hayward

Guava: Allahabad Safeda, L-49, and H-7.

Strawberry: Sweet Charlie, Ofra, and Chandler

Passion fruit: Purple, Yellow, Kaveri

Banana: Jahaji, Borjahaji, Chinichampa, Malbhog.

Litchi: Sahi, China, Bedana and Rose Scented

Pineapple: Kew, Queen.

Mango: Amrapalli.

Papaya: Honey Dew, CO-2.

Propagation techniques in guava, peach, citrus, passion fruit and kiwi have been standardized.

**Table 4: Standardization of Propagation Technique of Major Fruit Crop in the Region**

Crop	Rootstock	Standardized Technique
Citrus	<i>C.latipes, C. limonia, C. volkameriana, C.grandis</i>	Softwood grafting, wedge grafting
	<i>C. medica, c. latipes, C.jambheri, C. volkamariana</i>	Shield budding
Peach	Local peach	Tongue and Wedge grafting
Guava	<i>Psidiumguineense</i>	Patch budding
Kiwi		Cuttings
Passion fruit		Cuttings

High density plantation in banana, pineapple and guava have been standardized. In banana, cv. 'Dwarf Cavendish' is found effective in the spacing of 1.5 m x 1.5 m under Arunachal Pradesh climate. In pineapple, double row system of planting across the slope at the spacing of 30 x 45 x 90 cm is found to accommodate 45, 000 plants/ ha and to produce 40-50 tonnes yield per hectare.

An integrated approach in rejuvenation of citrus especially in Khasi mandarin and acid lime has been developed through preparation of half moon terraces and cleaning of basin, adoption of sanitation processes like removal of water shoots, dry and diseased twigs, lichens, mosses and parasites and orchard management practices like nutrient management practices schedule, IPM, moisture conservation measures and dehorning at 1 m and 1.5 m height.

### Vegetables

In vegetable crops, improved varieties and hybrids have been identified suitable for varied agroclimates. Package of practices for tomato, capsicum, French bean, brinjal, cabbage, cauliflower, sweet potato, colocasia, turmeric, ginger and chilli have been developed. Organic cultivation of ginger, turmeric and cole crops has been initiated. Some F<sub>1</sub> hybrids of brinjal and tomato, resistant to bacterial wilt are also in the advance stage at ICAR research Complex, Umiam.

**Table 5: Identified Varieties of Vegetable Crops for NEH Region**

Crop	Varieties / Hybrids
Potato	KufriKhasiGaro, KufriJyoti, KufriGiriraj, KufriMegha
Brinjal	Bholanath, Singhnath, PPC, Sel-5, RCMBL –1
Capsicum	Indame-3, Mahabharat, KT-1
Tomato	ArkaAlok, ArkaAbha, Manikhamnu, Manileima, Manithoibi, Rupali, Avinash – 2, Pusa Hybrid – 2, Rocky, cherry tomato.
Cauliflower	Snowball – 16, PusaShubhra, Himani, PusaHimjyoti, Pusa Synthetic.
Cabbage	PusaMukta, PusaAgeti, Green Express, Pride of India, Challenger
Broccoli	Fiesta, KTS-1, Pushpa,
Radish	JapaneseWhite, Chinese Pink, Meghalaya Local
Okra	7-Dhari, ParbhaniKranti, ArkaAnamika
Carrot	Nantes, Pusayamdagni, PusaMeghali, Hybrid-1
Chilli	Agni, Bird's Eye Chilli, DulleKhursani, Gauhati Black, Raja Mircha, TejpurChilli
French Bean	RCMFB – 1, ArkaKomal, PusaParvati
Cucumber	Poinsette, PusaSanjog
Sweet Potato	Sonipat –2, SreeBhadra, S-162
Colocasia	ML-1, ML-9
Pea	Arkel, Lincoln, PM-2, VL-3

### Spices

Tumeric: Lakadong, Megha Turmeric – 1

Ginger: Nadia, China, Varada

Large cardamom: Ramla, Red Sawney, Belak, Golsey, Madhusey, Ramsey.

In plantation crops coconut-arecanut based cropping system involving spices and fruit crops have been developed for the region.

Arecanut: Mangala, Sumangala

Black pepper: Panniyur, Hybrid-1-7, Panchami, Pournami



## Floriculture

The region is rich in ornamental plants like orchids, *Bauhinia*, *Cassia*, *callistemon*, *Erythrina*, *Jacaranda*, *Magnolia*, *Rhododendron*, *Azalia*, *Bougainvillea*, *Camelia*, *Gardenia hibiscus*, *Jatropha*, *Nerium*, *Thumbergia*. Out of 1350 orchid species reported, 900 species occur in NE region. Among orchid species, *Vanda teres*, *Vanda coerulea*, *Renanthera*, *Paphiopedilum*, *Dendrobium*, *Cymbidium*, *Cattleyas*, *Rhyncostylisretusa* are common. This region is potential for production of commercial flowers like orchids in Meghalaya, Arunachal Pradesh and Sikkim; anthurium in Meghalaya, Mizoram and Nagaland; liliiums in Nagaland; rose in Mizoram, Meghalaya and Nagaland; Gladiolus in Tripura; carnation in Meghalaya and Nagaland; gladiolus in Tripura, Meghalaya, Nagaland and Manipur and gerbera in Meghalaya and Assam. In gladiolus and gerbera, suitable varieties have been identified for the region.

**Table 6: Potential Flower Crops of NEH Region**

Sl. No.	States	Crops
1.	Assam	Orchids (dendrobium, vanda), anthurium, marigold, tuberose, jasmine, gladiolus, gerbera, bird of paradise, chrysanthemum
2.	Arunachal Pradesh	Gerbera, rose, carnation, gladiolus, orchids (cymbidium, paphiopedilum, vanda, oncidium), liliium, anthurium, foliage, succulent plants, begonia
3.	Manipur	Orchids (dendrobium), anthurium, roses, gerbera, carnation, Leather leaf ferns, marigold
4.	Nagaland	Orchids (dendrobium), calla lily, heliconia, bird of paradise
5.	Tripura	Dendrobium orchids, anthurium, gerbera, liliium, tuberose, marigold, gladiolus, chrysanthemum
6.	Mizoram	Anthurium, bird of paradise, rose
7.	Meghalaya	Anthurium, rose, carnation, asiatic and oriental lilies, calla lily, bird of paradise, heliconia, gerbera, golden rod, leather leaf fern
8.	Sikkim	Anthurium, orchids (cymbidium, phalaenopsis, oncidium, cattleya), alstroemeria, calla lily, carnation, bird of paradise, gerbera, chrysanthemum

Gladiolus: Friendship, Her Majesty, Summer Times, BisBis, White Prosperity, Novalux, Jester Gold, Oscar, PusaArchana, PusaShagun and Dhanvantari.

Gerbera: Piton, Monarch, Pink Elegance, RCGH-117, Alesmeera.

Package of practices of gerbera, gladiolus, anthurium and orchid have been standardized.

## Strategies

### Fruit Sector

- Selection of area specific high value low volume fruit crops and horizontal expansion with improved package of practices in cultivable wasteland with 7.14 lakh / ha of the region for increased productivity.
- Replacement of low yielding traditional varieties with resistant and high yielding varieties especially dwarf stature suited for high-density plantation.
- Production of required number of planting materials using tissue culture techniques and other propagation methods both under field and protected condition.
- Establishment of nurseries in each district / blocks under state horticulture departments or certified growers or progressive farmers.

- Arrangement of training / workshop to propagate orchard management packages to support production and maximize yield.
- Establishment of production sites for organic compost in each identified pocket to support organic nutrient management.
- Training and introduction of INM and IPM in the identified pockets.
- Training and introduction of the concept of Jalkund (water storage structure), drip irrigation and other water harvesting devices for life saving irrigation.
- Post harvest management, processing and value addition to the excess produce at block / district level through MM-IV or SHG.
- Adoption of hi-tech horticulture includes micro-propagation, micro-irrigation, fertigation, protected cultivation, organic farming and use of remote sensing to ensure the nutritional security for future generation.
- Adoption of advanced techniques of agriculture like crop diversification, contract farming, precision farming, fruit based farming system and reach the unreached in real time for high value fruit crops.
- Development of wholesale market, rural market at district level near to the city through MM-III or SHG. Already 11 land customs stations in the region have been identified for prioritization for development of infrastructure.(Table 7)

**Table 7: Land Custom Stations of NEH Region**

Sl. No.	Land Customs	Station State	Neighbouring Country
1.	Agartala	Tripura	Bangladesh
2.	Borsorah	Meghalaya	Bangladesh
3.	Dawki	Meghalaya	Bangladesh
4.	Demagiri	Mizoram	Bangladesh
5.	Ghasupara	Meghalaya	Bangladesh
6.	Karimganj	Assam	Bangladesh
7.	Moreh	Manipur	Myanmar
8.	Old Raghana bazaar	Tripura	Bangladesh
9.	Srimantapur	Tripura	Bangladesh
10.	Sutarkhandi	Assam	Bangladesh
11.	Zokhawthar	Mizoram	Myanmar

Different agri-export zones have been setup for the North Eastern Region

- Tripura – pineapple
- Sikkim- Floriculture, orchids, cherry pepper, ginger.
- Assam – Fresh ginger, Processed ginger
- Darjeeling – Tea

#### Vegetable Sector

- To increase productivity through selection of area specific vegetable crops and improved package of practices in fallow lands and the land other than current fallows with 8.45 lakh ha.
- Development of rainfed, disease and pest resistant and high yielding varieties/ hybrids of selected vegetable crops suitable for various land situations.

- Intensive vegetable crop production system through selection of suitable genotypes, cropping system, INM, IPM and organic farming approaches.
- Crop diversification from low value to high value crops, water loving crop to water saving crop, single crop to multiple crop / mixed crop, crop alone to crop with crop livestock – fish – apiculture and agriculture production to production with processing and value addition for sustainable vegetable production.
- Popularization of micro-irrigation through adoption of drip irrigation and drip herbigation, contract farming to risk sharing between firms and farmers, precision farming of high value vegetable crops for reduction of cost of production and maximization of profit.
- Production of quality seeds in high-tech way and development of community nurseries / seed village for raising seedlings.

### Spice Sector

- Attempts need to be made to increase productivity and area under turmeric, ginger and chilli.
- Local chilli, ginger and turmeric varieties having processing qualities shall be evaluated by research agencies for propagation and production maximization.
- Facilitating private-public partnership for processing, value addition and marketing.
- Organic production of ginger and turmeric for domestic and export market.

### Plantation Sector

- Growing of Assam lemon, papaya or banana as intercrops for existing coconut or areca nut based cropping system
- Plantation of large cardamom under natural forest areas or agroforestry programmes in high altitude and black pepper in low altitude areas.
- Mandatory cultivation of black pepper in the tea gardens of Assam as well as in the foothill areas of adjoining states.
- Processing and value addition of excess produce of coconut, areca nut and black pepper.

### Floriculture Sector

- Development of floriculture and establishment of at least one model village of floriculture near urban area supported with modern sales centers at nearby city and linkage with APEDA for export.
- Emphasis should be given on commercialization of flowers like rose, carnation, chrysanthemum, orchid, gladiolus, anthurium, lily, bird of paradise, gerbera, dry flowers, live plants and micropropagated plantlets through protected cultivation and creation of other infrastructural facilities.
- Identification of product / region as intensive floriculture zone to achieve qualitative and specific targets along with post-harvest facilities and availability of large scale planting materials.
- *In situ* and *ex situ* conservation and propagation of nearly 175 endangered species of orchids available in the region.

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