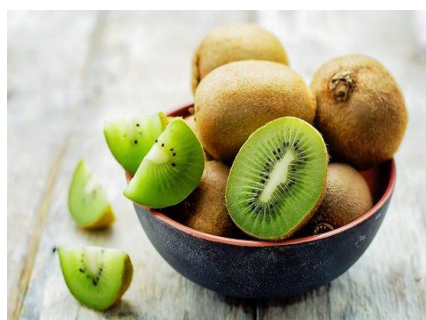
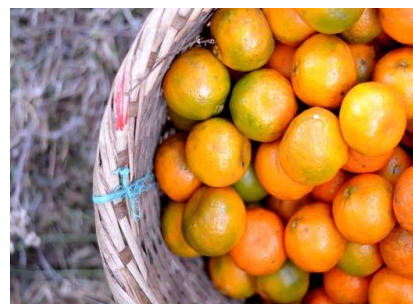


# **Action plan on Value Chain Development of Horticulture-Fruits & Vegetables Sector in NER**



## **DRAFT REPORT**

Submitted to

North Eastern Council (NEC) Secretariat  
Ministry of Development of North Eastern Region (M-DoNER)  
Govt. of India

Prepared by



**North Eastern Development Finance Corporation Ltd (NEDFi)**  
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# TITLE OF THE STUDY

## ACTION PLAN ON VALUE CHAIN DEVELOPMENT OF HORTICULTURE -FRUITS & VEGETABLES SECTOR IN NER

### EXECUTIVE SUMMARY

#### **1.0 International Year of Fruits and Vegetables-2021:**

The UN General Assembly has designated **2021 as the International Year of Fruits and Vegetables (IYFV)**. The International Year of Fruits and Vegetables 2021 falls within the UN Decade of Action on Nutrition (2016-2025) and the UN Decade of Family Farming (UNDAF 2019-2028). These observances reinforce each other while providing greater visibility to small-scale producers and raise awareness on food security and nutrition. The IYFV 2021 can act as a springboard towards achieving the **Sustainable Development Goals (SDG)** by 2030.

The agenda of the FAO for the International Year of Fruits and Vegetables (IYFV) includes among others the following agendas:

Improved sustainability of storage, transport, trade, processing, transformation, retail, waste reduction and recycling, as well as interactions among these processes.

Integration of smallholders including family farmers into local, regional, and global production, value/supply chains for sustainable production and consumption of fruits and vegetables, recognizing the contributions of fruits and vegetables, including farmers' varieties/landraces, to their food security, nutrition, livelihoods, and incomes.

To empower stakeholders, especially women and youth, through knowledge-building and skills development in the production and post-harvest handling, processing, preparation, marketing and consumption of fruits and vegetables.

#### **1.1. NER vision 2020**

- Translation of the Look East Policy to promote economic relationships with East Asian and Southeast Asian economies
- An enabling environment for private investment in the region would require significant public investment
- short-run focus is to move farmers from subsistence cultivation to cash-crop-oriented production

**1.2** The decision of the Ministry of DONER, Government of India to undertake an exercise to prepare a detailed Action plan for next 5 years for value chain development in Horticulture sector with focus on Fruits and vegetables of NER to tap the emerging potentials of north eastern region for empowering the farmers of the region, improving their income, is in consonance with the observation of the International year of fruits & vegetables across the globe. The initiative has further reinforced the commitment of the nation to attain sustainable development goals by 2030 with rest of the world. The proposed action plan accordingly has been drawn up to imbibe the spirit of the UN and FAO for observance of the International year of fruits and vegetables as mentioned in the above agendas.

**1.3** India is the second largest producer of Fruits and Vegetables in the world with a production of 289 Mn MT. According to the 3rd advance estimates 2019-20 of Department of Agriculture, Govt. of India, the country produced 100 Mn MT of fruits (with an area of 6.7 Mn Ha) and 189 Mn MT of vegetables (with an area of 10.4 Mn Ha). India ranks 1st in the world in production of bananas, mangoes, guava, papaya, ginger, and okra. India ranks 2nd in the world in production of green peas, potatoes, tea, tomatoes, sesame seed and many other key commodities.

However, processing levels for perishables in India is considerably low, despite being a leading producer, the processing levels for fruits & vegetables in India are at a meagre 2% with a 5-16% wastage loss across different crops.

**1.4** The National Center for Cold Chain Development (NCCD) has identified a gap of 3.2 Mn MT in cold storage capacity, more than 69,000 pack houses, more than 50,000 reefer vehicles and a gap of around 8,000 ripening chambers in India.

**1.5** According to the working group report under NITI Aayog on demand and supply projections for 2033, submitted in February 2018, the demand for horticultural products including fruits and vegetables will increase from 128 million tons in the base year of 2011-12 to around 190 million tons by 2020-21 and further to 327 million tons by 2032-33 in the baseline scenario. In the high growth scenario, demand will increase up to 215 million tons in 2020-21 and cross 430 million tons by 2032-33.

**1.6** Horticultural crops in the NE region accounts for 5.1% in fruits and 4.5% in vegetables tonational horticulture basket. However, there is immense potential for vertical and horizontal growth in horticulture sector in NE region. At present horticultural crops account for only 27.41% of cultivated area, on an average. The region's comparative advantages in producing fruits, vegetables and other horticulture products can be tapped by setting small-scale processing units for the local market, which will also create rural employment.

**2.0** Inline to the Prime Minister's vision expressed on his 65<sup>th</sup> Plenary Meeting of NEC towards development of North East, a review meeting was held on 22<sup>nd</sup> September' 2020. In this meeting, the PMO had instructed to adopt a holistic development approach towards the following identified focus sectors in NER – a) Bamboo, b) Oil Palm, c) Horticulture, d) Organic Farming, e) Spices and f) Handicrafts & Handloom.

Accordingly, NEDFi has been entrusted by the Ministry of DoNER, Govt. of India with the task of preparation of a five-year plan for value chain development of horticultural crops with focus on fruits and vegetables of North Eastern Region to tap the emerging potentials of north eastern region for empowering the farmers of the region by improving their income.

The detail TOR is placed with the methodology in chapter-II and in Apeendix-I of the report. The proposed Action plan according to the TOR includes the following:

- The current status of horticulture sectors of NER with special reference to fruits and vegetables
- Identify State wise priority crops of horticulture in the region for development of value chain
- Prepare a five-year holistic value chain development plan for priority crops in horticulture sectors for North eastern states with sub-plan for individual states, implementing agencies etc.

The contents of the report include the following, in addition to the above items:

- Issues & suggestions of the stakeholders.
- Concept of Agribusiness and Value Chain & Value chain components.
- Value chain profiles of few important crops.
- Suggestions for resolutions of the issues and challenges in horticulture sector.
- Suggested Implementation plan, process & architecture.
- Indicated sources of funding of the plan.
- Broad outline for redesigning NERAMAC as an anchor organisation.
- Value chain financing model for banks.
- IOT in agriculture value chain.
- Best practices for replication—Entrepreneurship led cluster development plan in NER & Largest

Value chain in India established & managed by FPC-Sahyadri Farms. Placed at **Annexure-XVI**(at page- 85 -)

**3.0** Current status of North East has been elaborated in **Chapter-III** of the report, few highlights are as below:

**3.1** The North East region of India, comprising of the state Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim is a reservoir of rich natural resources. All the north-eastern states have distinct advantages and provide immense economic and trade opportunities to domestic and international players. The NE region shares borders with China in the north, Bangladesh in the south-West, Bhutan in the north-West and Myanmar in the East. This makes the North-East a prospective hub of international trade and commerce.

**3.2** The 3<sup>rd</sup> advance estimates for the year 2019-20 by the department of Agriculture, co- operation farmers welfare, Govt. of India has indicated total area under fruit crops as 474.77 thousand ha and Vegetables are estimated to be grown in 564.11 thousand ha in the NE region. In terms of production, fruit production is estimated at 4887.49 thousand MT and vegetable production at 6276.91 thousand MT.

Table-A: State-wise Area and Production estimates for 2019-20

| States            | Fruit<br>s    |                | Vegetables    |                |
|-------------------|---------------|----------------|---------------|----------------|
|                   | Area          | Production     | Area          | Production     |
| Arunachal Pradesh | 48.14         | 125.84         | 2.62          | 17.39          |
| Assam             | 168.87        | 2562.3         | 312.97        | 3673.88        |
| Manipur           | 47.9          | 527.97         | 36.84         | 391.35         |
| Meghalaya         | 37.6          | 393.51         | 49.12         | 515.87         |
| Mizoram           | 63.77         | 344.91         | 36.49         | 181.7          |
| Nagaland          | 34.23         | 315.05         | 40.85         | 453.65         |
| Sikkim            | 19.54         | 55.45          | 38.8          | 231.4          |
| Tripura           | 54.72         | 562.46         | 46.42         | 811.67         |
| <b>NER</b>        | <b>474.77</b> | <b>4887.49</b> | <b>564.11</b> | <b>6276.91</b> |

(Source: Department of Agriculture, Co-operation & Farmers Welfare, Govt. of India)

State-wise data of crop-wise Area and production of different fruits and vegetables grown in different states in the region as of 2017-18, was compiled from different sources and is placed in **Annexure-XV**(at page- 80 -) of the report.

**3.3** Horticultural crops grown in NE region accounts for about 5.1% in fruits and 4.5% for vegetables in the national horticulture basket of India. Major fruit crops grown in the NE region having commercial value are Pineapple, Citrus, Banana, Kiwi, Passion fruit, Mango, Guava, Litchi, Papaya, Lemon, Orange, Jackfruit, etc. Among vegetables, Mushroom, Potato, Tomato, Cauliflower, Cabbage, Brinjal, Beans etc. are major crops grown in the region. These fruits and vegetable crops of the region possess huge opportunities for increasing the area under cultivation of the crops, productivity of the produce, value addition through developing food processing industries based on these crops.

**3.4** Regarding the availability of existing infrastructure and facilities for post-harvest management of fruits & vegetables in the region, the status was found to be as follows:

- According to the Annual report of MOFPI, 2018-19, the Ministry has approved 6 Mega Food Parks, 7 Cold Chain projects, and 3 projects under the scheme for Creation of Infrastructure for Agro Processing Clusters in Assam.
- The Ministry has approved 14 food processing units under CEFPPC Scheme, 2 projects approved in year 2019-20 in NER under the scheme Backward & Forward Linkage. 10 Food Testing Labs have been assisted to create infrastructure for food safety and quality testing in the region.

- Total 1357 Nos. of Integrated Pack House created under MIDH upto 31.03.2018 in the region, out of which 1347 pack houses were on farm pack houses, whereas 10 pack houses were integrated pack houses.
  - 69 cold storages with aggregate capacity of 243456 MT have been assisted in this region as on 31.03.2018.
- 6 projects for North Eastern states, under the CEFPPC Scheme of MOFPI with project costs of Rs. 48.87 crore and with grant of Rs. 20.35 crore, were approved by the Ministry on 21<sup>st</sup> Nov 2020.
  - APART has approved setting up of three Common Facility Centres at Sonitpur, Morigaon and Lakhimpur districts in Assam. In addition to one Fruits, vegetables and spices processing centre at Morigaon in Assam on 4<sup>th</sup> Dec 2020.

### 3.5 International Collaboration with Govt. of Israel

- North Eastern Region's first Regional Centre with Israeli collaboration was inaugurated in Mizoram on 7<sup>th</sup> March 2018. It was set up with a cost of Rs 10 crore.
- Foundation stone of Indo-Israel Centre of Excellence for Vegetables Protected Cultivation in Assam was laid on November 3<sup>rd</sup>, 2020, to be built at an area of 8 hectares, at a cost of Rs 10.33 crores, and will have facilities like hi-tech greenhouse, automated irrigation system, insect-proof net house, sale counter, weather station, etc.
- The government of Meghalaya will set up two Centres of Excellence (CoE) in the state, in collaboration with Israel, to improve and promote the livelihood of farmers. The first one will be set up for vegetables at Jongksha village in East Khasi Hills, and the second one will be setup for citrus fruits at Dawagre in East Garo Hills.
- Deliberations were held regarding setting up a 'Centre of Excellence' (CoE) in Tripura with World-class expertise of Israel for the benefit of the farmers in the State.

A brief note on the details of the above collaborations is placed in the **Annexure-XIX** (at page no. - 102 -).

**3.6** Indian Institute of Food Processing Technology (IIFFT) has set up a liaison office at Guwahati in July 2010. The unit has Food Processing Training Centre cum Incubation Centre, Training Classrooms and Office. Skill Training programs are organized for farmers

However, despite these distinct advantages and having tremendous potential for development of horticulture in the region as a major contributor to the region's economy, the sector is yet to grow up to its full potential.

### 3.7 Key observations in NER Vision 2020

- productivity is lower than the national average
- creation of cold storages, market infrastructure, mini processing units are essential
- Transport of the produce is hampered due to poor connectivity and shortage of specialized means of transportation
- Establishment of cold chain in PPP model along arterial highways is critical to exploit markets in the rest of the country.
- Agricultural link roads to reach farm output to markets
- Road, rail, air & inland waterways connectivity
- Availability of cyber, telecom & power facilities

In absence of adequate post-harvest infrastructure in the region, not only post-harvest losses are high, but dependency of farmers on intermediaries for marketing is also high. There exists large scope for development of post-harvest infrastructure and marketing network through Private-Public-Partnership model, presence, and involvement of regional agriculture marketing agency in facilitating collection, aggregation, processing, marketing etc. In addition, the COVID-19 pandemic has highlighted that we now have an opportunity to rethink the way in which we produce, handle, and waste our food.

**4.0** The plan is prepared largely based on the concerns of the stakeholders dealing with fruits and vegetables grown in the region and prospects in this sector which are captured in **Chapter-IV** of the report. Eight stakeholders' virtual interaction meets were held during the process of preparation of the plan with active participations and presentations of 64 value chain players across the whole spectrum of value chain in horticulture. The participants in the interactions included:

- State Govts, MOFPI, NHB, SFAC, APEDA, NAFED, NERAMAC, APART, AAI, AIDC.
- FPOs, FPCs, entrepreneurs from the region.
- Large buyers including processing units, cold storage units, suppliers of agro machineries.
- Representative of ASEAN chamber of commerce, Bangkok.
- Representatives from CFTRI, IIP, IIFPT.
- NABARD, Public sector & Private sector banks.
- Academics from universities, horticulture colleges in the region.

**4.1** The interactions provided ground level feedback and suggestions for developing effective value chain for horticulture in the region. The list of the value chain players interacted during the process is placed in **Annexure-XIII** (at page- 70 -).

**4.2** Number of Critical gaps were identified by different stakeholders in the areas of Production, Post-harvest management, and marketing of horticultural products in the region and suggestions to improve the situation. The stakeholders, in addition, also highlighted that:

Growers find it difficult to complete all the formalities of the Central Govt. schemes as some situations in north east does not match with the required parameters of the schemes

Exclusion of few crops important for the State under MIDH scheme for some States,

Facilities under 'Krishi Udaan' needs to be reviewed for making it more beneficial for the farmers of the region like inclusion of road transport subsidy for short distances and in smaller vehicles.

Entrepreneurs find difficulty in availing bank credit needed for availing credit link subsidy schemes of the Government and offer land as collateral due to existing land tenure system

Absence of any Anchor agency within the region to create the linkages from farm to bigger markets outside the region and abroad.

**5.0 Chapter-V** of the report deals with the process of selection of priority crops in the region. The plan was prepared after selection of priority crops from the list of fruits and vegetable crops grown in the region. For the purpose, the fruits and vegetables grown or available in the region were classified in three major categories as below:

**Category-I: Existing potential crops,** Crops which are grown by the farmers for its commercial value, adequate volume of production is available, the scope of increasing the area, productivity and production exists for these crops, or are available in abundance in the natural way, GI tag is available and value addition of the crops are economically feasible and have good market demand both within and outside the region and abroad.

**Category-II: Emerging potential crops**, which have definite potential, but the volume of production is yet to reach to an economic scale, farmers are yet to adopt the same crops for commercial cultivation in large scale, value addition activities may not be economic proposition at this stage. GI tag for the crop is under process.

**Category-III: Indigenous crops or Crops of future**, the crops or varieties of the crops which are indigenous and are grown by the villagers traditionally or are grown in the wild but have the scope for value addition, increasing production and upgrade these crops to commercial scale.

Selection of the crops were made after due consideration of the stake holders views, techno commercial viability, farmer empowerment, rural livelihood development and export development. Attention was given on the guiding principles of ‘vocal to local’, import substitution, ATMA NRBHAR, and Operation Total Schemes. Growing functional and Nutraceutical Food Market, quality requirements, GI tag and other USPs of North East Region and Next decade global food market developments – international study reports are other important aspects which were considered while identifying the priority crops for NE region and for development of the Five-year action plan.

The State-wise short-listed fruits and vegetables for the purpose of preparation of the action plan for value chain development is available in **Chapter-V** of the report.

**6.0** Understanding the concept of Agribusiness is a prerequisite to freeze the concept of Value chain for fruits and vegetables. Components of Agribusiness and Value Chain are incorporated in **Chapter-VI**. The concept of Agribusiness and value chain has also been detailed in **Annexure-II**(at page- 3 -) of the report.

Agribusiness is the business sector encompassing farming and farming-related commercial activities. The business involves all the steps required to send an agricultural good to market: production, processing, and distribution. It is an important component of the economy in countries with arable land since agricultural products can be exported.

Whereas Value chain in Agriculture is the invisible part of AGRIBUSINESS concept and is interconnected from FARMER to CONSUMER with number of steps, stages and connecting number of stake holders adding value to basic agro produce.

#### Importance of Value Chain

- Locally grown fruits and vegetables with the help of technology high value-added product/ingredient can be manufactured through value addition in different steps.
- All stake holders in the value chain can expect higher returns for the produce
- First stake holders finished product can be the raw material for next stake holders
- The value-added products can be marketed globally through the value chain to earn higher profits.
- Redeployment of profits for rural and farmer empowerment is possible to increase the yield and improve the quality of raw material.

Components and stakeholders of value chains are:

|  |  |
|--|--|
| <b>For Raw Material – Vegetables &amp; Fruits production</b> | Individual farmers, FPOs and FPCs  |
| <b>For Post-Harvest Sector</b>                               | Government agencies, SPVs, entrepreneurs, and FPCs/FPOs, investors   |
| <b>Food Processing sector</b>                                | Entrepreneurs, research community, food safety agencies, logistics agencies,   |
| <b>Forward Integration</b>                                   | Organized supply chain, distributors, online portals, e commerce portals, shops, MLM companies, government agencies, exporters |

**7.0 Chapter-VII** of the report deals in details with the five-year holistic value chain development plan for priority crops in horticulture sectors for North eastern states with sub plan for individual states, implementing agencies etc.

The plan has been developed with the following components:

- a. Profile of few important crops are prepared individually and are available in **Annexure-III**(atpage-5 -).
- b. Value chain process, components and infrastructure requirements for individual crops were identified and enumerated.
- c. Based on the above, and production data of the crop the investment required for each component of value chain for every state has been computed and compiled in State-wise sub- plans with year-wise requirements.
- d. The aggregated physical and financial outlays were mapped for each state and aggregated to draw up the five-year development of value chain plan for the region.
- e. The total fund requirement for investment for implementation of the plan, which included investment for infrastructure, backward linkages, support organisations, capacity building etc. were assessed and different sources of fund e.g. different Schemes of Govt. of India, Bank credit, Individual contribution etc. has been mapped and suggested in **Chapter-VIII** of the report.



**8.0** It is estimated that implementation of the proposed plan for value chain development would require **Rs.6138.87 Crore** over the next five years for the NE region. A summary of detail break-up is available in the next page.

Table-B: State-wise break up of investment required under the plan

| Head of expenditure  | State-wise break up of investment required under the plan (Rs. in Crore) |                |               |               |               |               |               |               |                | Existing scheme            |
|--|--|----------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------------------|
|  | Arunachal  | Assam          | Manipur       | Meghalaya     | Mizoram       | Nagaland      | Sikkim        | Tripura       | Total          |                            |
| <b>A. Investment in Value chain components</b>   |  |                |               |               |               |               |               |               |                |                            |
| i) Investment for Infrastructure post-harvest & processing                                 | 182.18   | 351.05         | 124.73        | 135.75        | 116.89        | 128.65        | 103.14        | 117.99        | <b>1260.38</b> | <b>MIDH, KISAN SAMPADA</b> |
| ii) Investment in infrastructure for backward linkage                                      | 6.50   | 37.00          | 9.00          | 9.00          | 5.50          | 9.00          | 4.50          | 4.50          | <b>85.00</b>   | <b>MIDH, S&amp;T -BT</b>   |
| iii) Investment for marketing, branding & quality monitoring (NERAMAC)                     | 21.86  | 42.13          | 14.97         | 16.29         | 14.03         | 15.44         | 12.37         | 14.16         | <b>151.25</b>  | <b>New Scheme</b>          |
| <b>Sub Total</b>   | <b>210.54</b>  | <b>430.18</b>  | <b>148.7</b>  | <b>161.04</b> | <b>136.42</b> | <b>153.09</b> | <b>120.01</b> | <b>136.65</b> | <b>1496.63</b> |                            |
| <b>B. New area expansion</b>   | 925  | 1221           | 592           | 407           | 407           | 407           | 148           | 296           | <b>4403</b>    | <b>RKVY/MIDH</b>           |
| <b>Sub Total</b>   | <b>1135.54</b>   | <b>1651.18</b> | <b>740.70</b> | <b>568.04</b> | <b>543.42</b> | <b>560.09</b> | <b>268.01</b> | <b>432.65</b> | <b>5899.63</b> |                            |
| <b>C. Capacity building of farmers and FPOs</b>  | 4  | 8              | 4             | 4             | 4             | 4             | 2             | 2             | <b>32</b>      | <b>SFAC, NABARD, EDI</b>   |
| <b>D. Credit Guarantee fund for NER</b>  |  |                |               |               |               |               |               |               | <b>100</b>     |                            |
| <b>E. Preparatory investment for survey/studies for NER</b>                                |  |                |               |               |               |               |               |               | <b>2.50</b>    | <b>New scheme</b>          |
| <b>F. Monitoring &amp; review of implementation @2% of total investment "A"</b>            | 4.21   | 8.6            | 2.97          | 3.22          | 2.73          | 3.06          | 2.40          | 2.73          | <b>29.92</b>   | <b>New scheme</b>          |
| <b>G. Administrative expenses including DPR preparation @5% of total investment in "A"</b> | 10.53  | 21.51          | 7.43          | 8.05          | 6.82          | 7.65          | 6.00          | 6.83          | <b>74.82</b>   | <b>New scheme</b>          |
| <b>Total</b>   |  |                |               |               |               |               |               |               | <b>6138.87</b> |                            |

Table-C: Year wise break up of Total investments

(Rs. In Crore)

| Investment Head  | Year 0      | Year 1         | Year 2         | Year 3         | Year 4         | Year 5        | Total          |
|--|-------------|----------------|----------------|----------------|----------------|---------------|----------------|
| Preparatory Investment Survey/Studies (4 Nos.)           | 2.50        |                |                |                |                |               | 2.50           |
| Post-harvest infrastructure                              |             | 184.20         | 616.08         | 269.38         | 62.34          | 128.37        | 1260.38        |
| Marketing & Branding                                     |             | 30.25          | 30.25          | 30.25          | 30.25          | 30.25         | 151.25         |
| Backward linkage infrastructure                          |             | 20.00          | 41.50          | 20.50          | 3.00           | 0.00          | 85.00          |
| Capacity Building of farmers/FPOs/FPCs*                  |             | 6.40           | 6.40           | 6.40           | 6.40           | 6.40          | 32.00          |
| Monitoring & Review @2% of Total Infrastructure cost     |             | 4.69           | 13.76          | 6.40           | 1.91           | 3.16          | 29.92          |
| Administrative expenses @5% of Total Infrastructure cost |             | 11.72          | 34.39          | 16.01          | 4.78           | 7.93          | 74.83          |
| Creating a credit Guarantee fund                         |             | 50.00          | 50.00          | 0.00           | 0.00           | 0.00          | 100.00         |
| <b>Sub-Total</b>   | <b>2.50</b> | <b>307.26</b>  | <b>792.37</b>  | <b>348.94</b>  | <b>108.68</b>  | <b>176.11</b> | <b>1735.88</b> |
| <b>New area expansion</b>                                |             | <b>1100.75</b> | <b>1100.75</b> | <b>1100.75</b> | <b>1100.75</b> | <b>-</b>      | <b>4403.00</b> |
| <b>Total</b>   | <b>2.50</b> | <b>1408.01</b> | <b>1893.12</b> | <b>1449.69</b> | <b>1209.43</b> | <b>176.12</b> | <b>6138.88</b> |

\*Notes: Per Centre Capacity building of 40 farmers /day X 20 Days X 10 months= 8000 participants x 500.00 /day= 40 lakhs/ year. Cost calculated against No. of Training Centre.

Table-D: Year wise break up of Total Fund allocation

(Rs. in Crore)

| Head of expenditures                                     | Share / Sources        | Year-0                    | Year-1         | Year-2         | Year-3                  | Year-4         | Year-5        | Total          |
|--|------------------------|---------------------------|----------------|----------------|-------------------------|----------------|---------------|----------------|
| Preparatory Investment Survey/Studies                    | 100% Govt.             | 2.50                      |                |                |                         |                |               | 2.50           |
| Investment for marketing, branding & quality monitoring  | 100% Govt.             |                           | 30.25          | 30.25          | 30.25                   | 30.25          | 30.25         | 151.25         |
| Capacity Building of farmers/FPOs/FPCs                   | 100% Govt.             |                           | 6.40           | 6.40           | 6.40                    | 6.40           | 6.40          | 32.00          |
| Monitoring & Review @2% of Total Infrastructure cost     | 100% Govt.             |                           | 4.69           | 13.76          | 6.40                    | 1.91           | 3.16          | 29.92          |
| Administrative expenses @5% of Total Infrastructure cost | 100% Govt.             |                           | 11.72          | 34.39          | 16.01                   | 4.78           | 7.93          | 74.83          |
| Creating a credit Guarantee fund                         | 100% Govt.             |                           | 50.00          | 50.00          | 0.00                    | 0.00           | 0.00          | 100.00         |
| <b>Sub-Total A</b>                                       | <b>100% Govt.</b>      | <b>2.50</b>               | <b>103.06</b>  | <b>134.80</b>  | <b>59.06</b>            | <b>43.34</b>   | <b>47.74</b>  | <b>390.50</b>  |
| Post-harvest infrastructure                              |                        |                           | 184.20         | 616.08         | 269.38                  | 62.34          | 128.37        | 1260.38        |
| Backward linkage infrastructure                          |                        |                           | 20.00          | 41.50          | 20.50                   | 3.00           | 0.00          | 85.00          |
| <b>New Area Expansion*</b>                               |                        |                           | 1100.75        | 1100.75        | 1100.75                 | 1100.75        | -             | 4403.00        |
| <b>Total</b>   |                        |                           | <b>1304.95</b> | <b>1758.30</b> | <b>1390.63</b>          | <b>1166.09</b> | <b>128.37</b> | <b>5748.38</b> |
|  | 50% Govt.              |                           | 652.48         | 879.16         | 695.32                  | 583.05         | 64.19         | 2874.19        |
|  | 40% Bank credit        |                           | 521.98         | 703.33         | 556.25                  | 466.44         | 51.35         | 2299.35        |
|  | 10% Owner contribution |                           | 130.50         | 175.83         | 139.06                  | 116.61         | 12.84         | 574.84         |
| <b>Govt. sources</b>                                     | <b>Bank Credit</b>     | <b>Owner contribution</b> |                |                | <b>Total investment</b> |                |               |                |
| <b>3264.69</b>   | <b>2299.35</b>         | <b>574.84</b>             |                |                | <b>6138.88</b>          |                |               |                |

\*Budget for investment under New Area Expansion may be provisioned under RKVY/ NHB

**9.0** The implementation process, architecture, phases in details has been laid out in **Chapter-IX** of the report.

**Implementation process:** Considering the practical parameters and to make 100% doable and self- sustainable of the proposed value chain, the following key drivers are recommended,

1. Single window implementation through an independent agency which will be either SPV or Mission (e.g. NERLM or proposed NE AHED scheme). This will simplify the project implantation process by following easy to do business.
2. Marketing of the products and services to be created from the proposed value chain project. The main success of the project will be the repeat sale over the country and Globe for which an umbrella brand for North East need to be established and the product promotion strategy and sales network to be established solely by an experts Anchor agency. NERAMAC may be restructured and identified as the 'Anchor Agency' for implementation of the plan
3. A special cell of agribusiness incubation and mentoring to be established at each Training Centre. That will strengthen the business plans and capacity building of the potential agripreneurs in the region.

NEC may be entrusted with the responsibility of oversight of the implementation of the plan and review the progress every month with the States and NERAMAC. Ministry of DONER may review the progress every quarter to ensure that the implementation process is in track and desired outcome of the plan is achieved

#### **Phases of implementation:**

##### ➤ **Short term implementation of the plan (Preparatory work): Timeline 6 Months to 1 Year**

- Approval of the plan, preparation and approval of the DPR by the appropriate authorities and share the same with the State Governments.
- Completion of all baseline surveys to compile field level data on Area, production, and locations of different crops, identify clusters of growers, linking with existing FPOs, building relationship between FPOs and the growers.
- Complete the study to Restructure NERAMAC as an anchor organisation, according to the broad outlines suggested in **Annexure-X** (at page - 59 -). Identify NERAMAC as the anchor organisation, NERAMAC to create a common brand for the NE Region and plan for publicity of the brand.
- Establish protocols with the banks and financial institutions in NE region by State Governments, as suggested in the note for financing the value chains and placed in **Annexure-XI** (at page - 61 -), for financing the FPOs, Post-harvest management facilities by entrepreneurs.

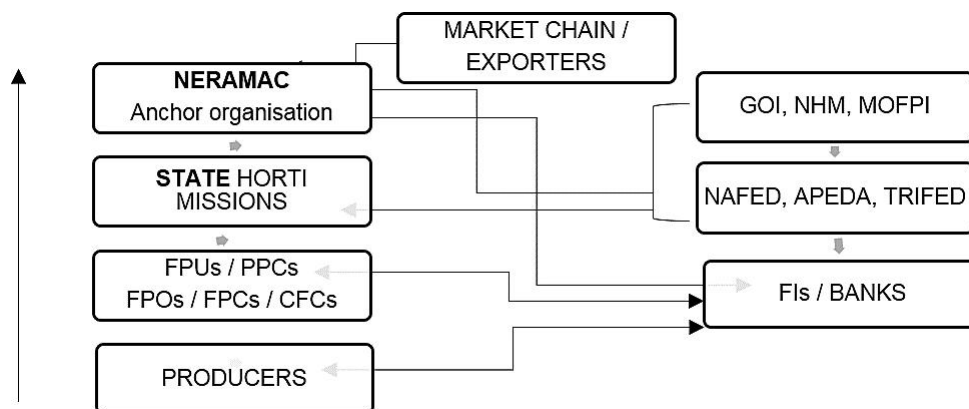
##### ➤ **Mid-term implementation of the plan: Timeline 1 Year to 2 Years**

- Making provisions for fund required for implementation of the plan.
- Start capacity building exercises for the growers and FPOs.
- Begin investment for creation of infrastructures and facilities for developing the value chain according to the plan.
- Activate the process for aggregation, sorting, grading, packaging facilities at FPO level and bulk marketing through NERAMAC. Provide transport facilities like Reefer vans, transport subsidy etc. to FPOs for collection of produce from the farms.
- Activate all Primary Processing Centers across the region.
- Encourage technology interventions through Agri tech startups.
- Create a common technology platform to be hosted by the 'Anchor organisation' linking all infrastructures, facilities in the region and host all current database of the region.

- **Long term implementation of the plan: Final stage: Timeline 3 years to 5 years**
  - Completion and commissioning of all infrastructure and facilities for post-harvest management under the plan.
  - Operationalize complete value chain process for fruits and vegetables of NE Region.

#### Implementation architecture:

Figure-A: Implementation Architecture



**10.0 Chapter-X** of the report deals with the outputs & outcomes of this plan, which shall be the game changer in development of horticulture sector in the region. The gist of outcomes envisaged are listed below:

#### Major Outcomes of the Plan

**Area Expansion:** Total 1,19,000 Ha proposed for development of new Farm area with increase in productivity. Provision of high-tech nurseries and tissue culture labs in the plan will ensure supply of adequate quantity of improved quality of planting materials to help in higher productivity and production in the region. Israel's technology for increasing productivity can be introduced in the New Farm Development for increasing yield.

**Annual reduction of Post-Harvest losses:** Value addition of Horticulture Products through creation of Value Chain Infrastructure (both post-harvest as well as backward infrastructure and Value Chain support infrastructure) which will give satisfactory returns to all stakeholders involved in the Value Chain. Post-harvest handling and processing will reduce about 10% of Post-Harvest losses caused due to absence of Value-Chain. Approximately Rs. 4280.00 Crores per annum is estimated to be saved due to annual reduction in Post-Harvest losses.

It is assumed that 25%-30% of the production of the crops shall be routed through the value addition process of the value chain in NE, after meeting the local demand for consumption as fresh fruits and vegetables. Value addition process shall help the farmers in better price discovery at every stages of the chain.

**Brand Building:** A common brand for North East region can be created and established with the USPs like traceability, safety, quality, natural or organic production etc.

**Employment Generation:** An important outcome of this plan is generation of employment in rural area. There will be the provision of generation of both direct and indirect employment from the value chain activities. In Value chain Post harvest & support activities total 8486 nos. of direct employment will be generated. Besides, in farm sector, altogether total 487900 nos. of employment both direct & indirect will be generated.

**Income Generation:** Doubling farmers' income by increase in yield, value addition and entering into global market. All the proposed units can export fresh and processed vegetables all over the Globe. Products from Value added Units can also be exported 100% by which the nation will earn foreign currency.

**Capacity Building of Farmers:** Addressing the Pre & Post Harvest handling needs of the farmers; approx. 476000 nos. of farmers per year will be trained within the proposed 5 years Plan.

**Revenue return to the Government:** Approx. Rs. 1797.20 Lakhs/annum of revenue will be generated in the form of GST (on Job Work basis). The Quality Analysis Lab and Certification Agency will also collect GST on their services by 18%.

#### Other outcomes of the Plan

Higher production of Fruits & Vegetables in NER to meet the 'vocal for local' campaign.

Increase in bulk export facilities.

Increase interest of the farmers in agriculture and also reduce migration from agriculture sector with improvement in Growers'/Farmers' income.

#### Socio-Economic Impact

Table-E (1): Employment Generation

| States Parameters  | Arunachal Pradesh | Assam  | Meghalaya | Mizoram | Manipur | Nagaland | Sikkim | Tripura | Total  |
|--|-------------------|--------|-----------|---------|---------|----------|--------|---------|--------|
| Employment Generation In ValueChain Post Harvest & Support Activities(in nos.) | 957               | 2273   | 968       | 782     | 956     | 1018     | 652    | 880     | 8486   |
| Employment Generation In Farm sector Direct and Indirect (in nos.)             | 102500            | 135300 | 45100     | 45100   | 65600   | 45100    | 16400  | 32800   | 487900 |

Table-E (2): Capacity Building of Growers/ Farmers

| States Parameters                          | Arunachal Pradesh | Assam | Meghalaya | Mizoram | Manipur | Nagaland | Sikkim | Tripura | Total  |
|--|-------------------|-------|-----------|---------|---------|----------|--------|---------|--------|
| No. of Farmers to be trained (in Nos./ Yr) | 16000             | 32000 | 16000     | 16000   | 16000   | 16000    | 8000   | 8000    | 476000 |

Table-E (3): Savings due to reduction in Post-Harvest losses

| States Parameters  | Arunachal Pradesh | Assam | Meghalaya | Mizoram | Manipur | Nagaland | Sikkim | Tripura | Total  |
|--|-------------------|-------|-----------|---------|---------|----------|--------|---------|--------|
| Total Volume Handled by ValueChain – (MT/year)   | 32000             | 81000 | 59000     | 40000   | 56000   | 64000    | 32000  | 64000   | 428000 |
| Annual reduction @10% in post-harvest losses of perishable due to Collection at Farm Gate and Handling & Processing Scientifically (MT/year) | 3200              | 8100  | 5900      | 4000    | 5600    | 6400     | 3200   | 6400    | 42800  |

|   |        |        |        |        |        |        |        |        |                |
|---|--------|--------|--------|--------|--------|--------|--------|--------|----------------|
| Considering<br>Avg. value of<br>F&V @ INR<br>10.00/kg<br>Total Savings (INR<br>in Lakhs/ annum) | 320.00 | 810.00 | 590.00 | 400.00 | 560.00 | 640.00 | 320.00 | 640.00 | <b>4280.00</b> |
|---|--------|--------|--------|--------|--------|--------|--------|--------|----------------|

Table-E (4): Return to the Government

| <b>States<br/>Parameters</b>                      | <b>Arunachal Pradesh</b> | <b>Assam</b> | <b>Meghalaya</b> | <b>Mizoram</b> | <b>Manipur</b> | <b>Nagaland</b> | <b>Sikkim</b> | <b>Tripura</b> | <b>Total</b>   |
|---|--------------------------|--------------|------------------|----------------|----------------|-----------------|---------------|----------------|----------------|
| Total GST Collection only on Job Work (INR Lakhs) | 301.20                   | 602.40       | 153.10           | 148.10         | 148.10         | 148.10          | 148.10        | 148.10         | <b>1797.20</b> |

