

# Action plan on Value Chain Development of Spice Sector in NER



## DRAFT REPORT

Submitted to  
Ministry of Development of North Eastern Region (M-DoNER)  
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Prepared by



**North Eastern Development Finance Corporation Ltd (NEDFi)**  
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# EXECUTIVE SUMMARY

## TITLE OF THE STUDY PREPARATION OF ACTION PLAN ON VALUE CHAIN DEVELOPMENT OF SPICES SECTOR IN NER

**1.0** India has a glorious past, pleasant present and a bright future with respect to production and export of spices. India is popularly known as the “Spice Bowl of the World” and “The Land of Spices” since pre-historic times. Out of 109 varieties of spices listed by the International Organization for Standardization (ISO), India produces 75 varieties of spices and accounts for around half of the global trading in spices. The ‘King’ of spices i.e., Black Pepper and the ‘Queen’ of spices i.e., Cardamom hail from India.

India is the world's largest producer, consumer and exporter of spices. It has a long history of producing and exporting spices to many countries in the world. The current production is about 9.4 million tonnes from 3.8 million hectares of land which constitutes about 1.97 percent of the total cropped area of the country. The bulk of the spices produced are consumed within the country and only 7 to 10 percent of the total production is exported.

**2.0** Spices constitute an important group of agricultural commodities which are virtually indispensable in the culinary art. Increasing awareness among people about the health and functional benefits of spices has boosted the potentiality of spice market. Spices are of low volume-high value and export oriented commodity crops, which play an important role in agricultural economy of the country.

Spices are grouped basically as major and minor spices in terms of availability, usage, importance and demand. The demand scenario for major and minor spices is increasing at an enormous rate in India and abroad. Indian spices scored its recognition in the world for centuries. Value addition of spices is the highest recognition of the value of its product through processing, packaging and marketing. India is the hub for manufacturing and export of high end value added products of spices i.e., spice oils and oleoresins in the international market retaining more than 80% share in the global market.

**3.0** Although, spices have been used in India as medicine since ancient times, but the Global communities have realized the necessity of IMMUNITY Booster agro produce and food products only after the COVID 19 pandemic. Growing demand from this emerging Nutraceutical sector is driving the global consumption of Indian spices further at a time when the country is straining to meet the needs of the traditional food sector. Nutraceutical sector now accounts for nearly 15% of spice production in the country estimated at 50 lakh MT per year. This sector is growing at 12- 14% in the US, 8-10 % in Europe, 14% in China and almost 9% in Japan while it is still at a nascent stage in India. Global food industry where spices are traditionally used is also growing at 3-5 %.

To meet the rising needs, the spice industry is going for more imports as the domestic production is becoming insufficient. According to Spices Board of India, the country imported 18,000 tonnes of pepper last year and around 4,000 tonnes to 5,000 tonnes of turmeric and another 4,500 tonnes of dry ginger.

**4.0** North Eastern Region produces more than 7 lakh tonnes of spices annually which accounts for 9% of the total production of spices in the country. North Eastern Region (NER) of India has tremendous opportunities, resources and potential for development of Value Chain for a variety of spices. The agro-climatic conditions prevailing in North Eastern States are suitable for cultivation of various high value spices like Turmeric, Ginger, King Chillies (Naga Chilli), Bird's eye Chilli (Mizo Chilies), Bay leaves and Large Cardamom. Spices grown in NER are naturally organic

or ‘organic by default’. There is great scope in promoting production of organic spices in NER states by popularizing Organic Farming practices among growers.

The geographically strategic location of North East Region (NER) acts as a gateway to the South East Asian countries. With its proximity to South East Asian markets, this region has great potential to emerge as a major hub for spice business for both domestic & international markets which makes NER as the prospective hub of International Trade & Commerce.



**5.0** But unfortunately irrespective of much biological and commercial strength of NER Spices, the farming of spices, its processing, trading and exporting is still in a nascent stage. There is a huge scope for value addition of spices in the region. Different value added products from spices like oil and oleoresins, powdered form, paste from ginger & turmeric, pepper and ginger in brine, Curcumin from turmeric, Capsanthin and Capsaicin from chillies, candy, cookies, flakes, beer, wine and juice from ginger, white, dehydrated, freeze dried canned, bottled and dehydrated salted green pepper etc. can be prepared from spices in NER. Curcumin from Turmeric, Gingerol from Ginger, Piperine from Black Pepper, Saponins from Fenugreek seeds etc. are the examples of the active components of spices with health benefits. So cultivation, post-harvest processing, value added processing and global supply of spices will be the big ticket business potential for North East Region of India.

**6.0** In line with the Prime Minister's vision expressed in the 65th Plenary Meeting of NEC towards development of North East, a review meeting was held at the Prime Minister's Office (PMO) on 22nd September' 2020. In this meeting, the PMO had advocated adoption of 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 to overcome the current weakness and grab the opportunities, to empower farmers and agribusiness of the North Eastern Region.

Accordingly, NEDFi in association with the North Eastern Council (NEC) 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 spice crops in North Eastern Region. The decision of the Ministry of DoNER, Government of India to undertake this exercise to prepare a detailed Action Plan for next 5 years for value chain development of spices sector in NER is to tap the emerging potentials of North Eastern region for empowering the farmers of the region, improving their income, supporting the livelihoods and improving the economic level of many spice growers of NER. The proposed Action Plan has been drawn up for value chain development of spices in order to provide economic upliftment of the farmers of the NER.

**7.0** The proposed Terms of Reference of the study are as below-

- a) To assess the current status of the Spices sector of NER through stakeholders' consultation.
- b) To identify state wise focused spices for development of complete Value Chain.
- c) To prepare a 5 year developmental Action Plan including state(s) specific sub-plans, with resource requirement and role of stakeholders.

The detail Terms of Reference (TOR) along with the methodology is outlined in **Chapter-I** and also in **Annexure-I** (at Page No. 87) of this report.

To design the five years Action Plan for development of Value chain of spice sector in NER, the basic logic and methodology used are,

- a) Stake holders' interactions.
- b) Global Spice Market Scenario & projections – ASTA, European Spice Trade Association and FAO's reports.
- c) Interaction with the major players in the Spice Business – Synthite Industries Ltd, VKL Ltd, AVT McCormick Pvt Ltd, MTR Foods Ltd, Universal Spices Ltd. etc.
- d) The Key requirement of the market for next decade – Traceability and Safe Food Manufacturing Practices.
- e) The authentic and effective technologies.
- f) Need of Export Facility Centre.
- g) Organic Certification for farm and Manufacturing set up and survival.

The following facts of spice business are considered while developing the action plan on Value Chain development of spices in NER

- a) Spice Trade is high value and high volume business.
- b) Spices business is linked with Future and Options /NCDEX /forward trading.
- c) Single crop trade, stock and processing is the main key for commercial success.
- d) The International Trade of spices is dominated by ASTA and European Spice Trade Association.
- e) Spice Crops are seasonal in nature– the peak season will be for three to four months and for commercial

success, stock of spice crops should be mandatory for sustainability.

- f) Primary Processing Units near to the cultivation area with techno commercial viable capacity should be established.
- g) To cater the variety of blends, taste and other parameters – blending of various species are required.
- h) To design the Spice value chain references are taken from various Indian Spice Corporate and Traditional business house (family owned business house).
- i) Synthite Industries Ltd, VKL Ltd, Indian Products Ltd, Sainy Spices, Paras Spices are few examples who established single commodity PPCs and CFCs for spices at the major spicetrade centers. With this reference single or multiple spice crop PPC and CFC set up is designed. (For Turmeric & Ginger, some processes can be conducted in same facility)
- j) Global Market scenario of spices

No	Year	Global Spice Market in Billion USD	Remark
1.	2019	5.86	6.5% annual growth
2.	2020	6.58	
3.	Expected in 2027	9.70	

(Source: <https://www.grandviewresearch.com/>)

- k) Indian Spices export in 2019-20 was 8% more by volume and 10% more by value and 11,83,000 tonnes by volume and INR .21515.40 crores (US \$3033.44 million) by value (Ref:Spices Board of India).
- l) To increase the share of North East Indian Spices contribution in Nation's export – Look East Policy is designed.
- m) Irrespective of very healthy geographical diversity for spices farming in NER , the contribution of NER in National Spice business is around only 15-20 % (Ref: Mr. V.Hnamte,R.Chatterjee , P.K. Chattopadhyay& A. Pariari Joint research paper).
- n) While designing the Action Plan on Value Chain Development of Spices in NER we consider doubling the production in area and volume in next five years.
- o) To achieve the target growth of the volume & area of spices, we consider 2000 to 5000 Ha additional farm development activity per spice per state.
- p) NER will be the Spice Hub for Far East and South East countries with the new international road and railway project development.
- q) Hi Tech Nurseries and Farmer Training Institutes will be the main tools to achieve the target (The Training Institute proposed in the Action Plan on Value Chain Development of Horticulture–Fruits & Vegetables in NER can be used for capacity building of spices farmer).

**8.0** This Action plan on Value Chain Development of spices in NER will be the multi- dimensional tool for livelihood development, employment generation and export income for NER farmers and value chain stake holders. This Action Plan will be the pathfinder for NER Spices Business as Game Changer for livelihood, employment generation, value addition, export and accelerating domestic trade.

The proposed Action plan includes the following:

- ▶ The current status of Spice sectors in NER, Challenges and Opportunities.
- ▶ Identify state wise focused spice crops & emerging spice crops for development of complete value chain. Crop profile of major spices of NER.
- ▶ The existing support schemes of Govt. of India/ State Govt. in value chain development of the Spice sector.
- ▶ Crop wise value chain with investment profiles. Investment details of the value chain components with assumptions.
- ▶ A five year holistic value chain development plan for focussed crops in spice sectors for North Eastern states.
- ▶ Implementation arrangement & process flow chart- Single Window Implementation system i.e., implementation through Special Purpose Vehicle (SPV) or Mission mode.
- ▶ Mapping of the possible sources of funding and new schemes that can be formulated for the purpose.
- ▶ Indicating expected outputs and outcomes of implementation of the plan.
- ▶ Few best practices in NER has also been incorporated in **Chapter-X** of this report.

**9.0** Current scenario of spices has been elaborated in **Chapter-II** of this report. Few highlights are as below-

India is an important centre for spices production. According to the Department of Agriculture, Cooperation & Farmers Welfare, Govt. of India in its 2<sup>nd</sup> advance estimates for the year 2019-20 the total area under Spice Crops in India is estimated at **3824** thousand ha and the production at **9420** thousand MT. For North Eastern Region, the area under Spice Crops is estimated at **228.97** thousand Ha with a production estimate of **737.58** thousand MT. State wise area and production of spices in NER are given below.

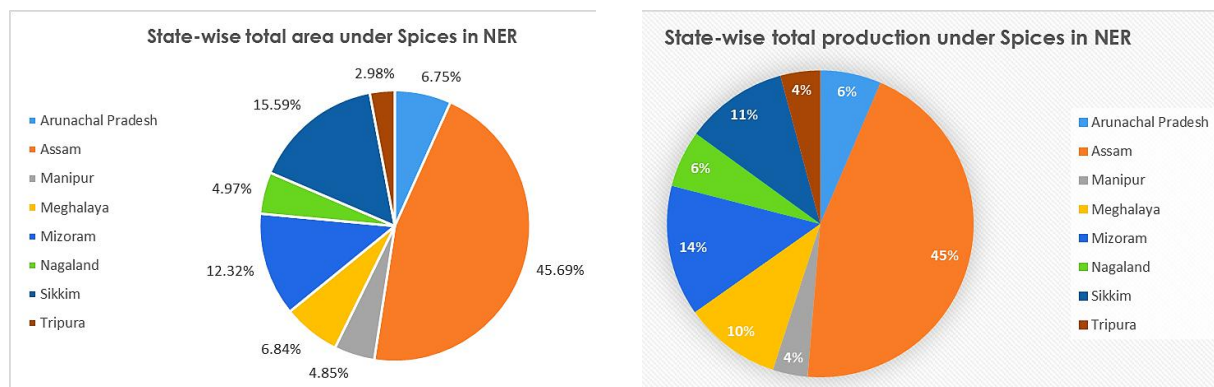


Figure-ES.1: State wise total Area and Production of spices in NER

The total area under spice cultivation in NER amounts to almost 6% of the total Spice cultivation area in India and almost 8% of the total production in India. The region is the largest producer of Large Cardamom in India, producing more than 90% of the total production of the country.

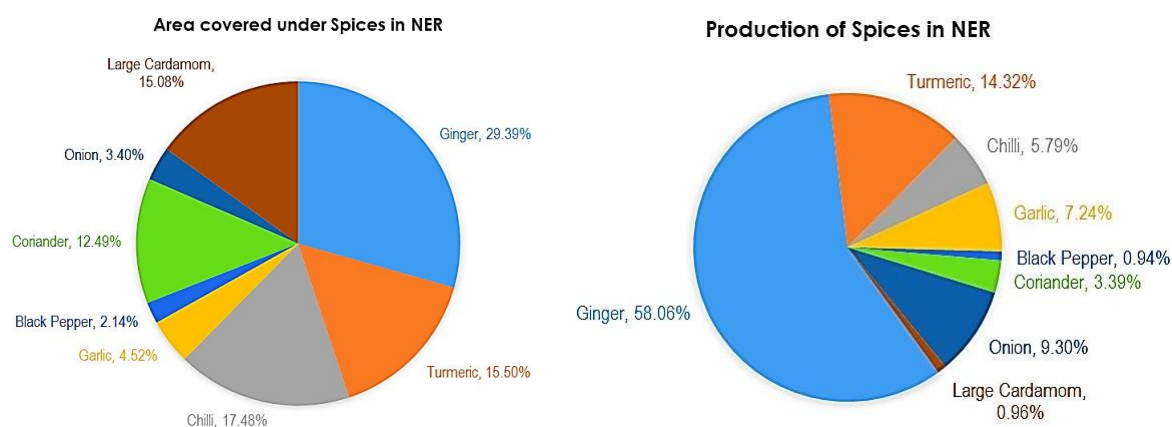


Figure-ES.2: Crop wise total Area & Production of spices in NER

India is the largest producer of ginger in the world, producing about 80 per cent of the world's production. In world production, India ranks second largest producer of pepper after Indonesia. India is also the largest producer & exporter of large cardamom in the world. NE region contributes more than 85% of the production of large cardamom in the country. Nepal and Bhutan are the other important producers of large cardamom. Out of the total spice production; it exports about 8-10% of total spice production.

**10.0** In recent years, there is a steady growth in the retail sales of organic foods including organic spices due to increase in awareness among consumers about its health benefit. There is an increasing demand for healthy food and natural flavors as substitute of salt, sugar and artificial products. It is expected that the health food segment will grow in many fold in near future. The organic spice and herbs market is relatively small but is expected to grow as supermarket chains start offering a complete product range of spices.

India is one of the main players in Global Spices Trade. The major spices trade centers in India are placed below. These trade centers are dominated by single spice crop.

No	City	Spices Trade
1.	Sangli (Maharashtra), Erode, Salem (Tamilnadu)	Turmeric
2.	Nimach (Madhya Pradesh)	Coriander
3.	Unza (Rajasthan )	Cumin
4.	Nagoury (Rajasthan)	Kasuri Methi , Mint
5.	Shimla (Himachal Pradesh )	Anardana, Bay Leaf , Curry Leaf
6.	Kashmir	Keshar
7.	Guntur (Andhra Pradesh)	Chilli
8.	Edukki (Kerala)	Cardamom (Small) , Black Pepper , Cinnamon
9.	Mumbai	Imported Herbs – Oregano, Thyme etc
10.	Coimbatore	Curry leaves

**11.0** During 2019-20, spices exports of India have reached the milestone of \$3 billion. India exported 11,83,000 MT of spices/ spice products valued at Rs.21515.40 crore during 2019-20 registering an increase of 8% in quantity, 10 % in rupee terms and 8% in dollar terms compared to 2018-19. Export of value added products contributes 51% in the total export of spices from the country. In 2019-20, India exported 225 items of spice / spice products to 180 countries.

**12.0** The demand for Indian spices remains stable despite the Covid-19 pandemic situation. The demand for spices is not only high in India but also in countries such as the United States, European Union, Arab countries and South Asian Countries. To meet the global demand, the Spices Board of India has proposed to set an export target of \$5 billion by 2025 and \$10 billion by 2030.

According to the forecasted data on population, the population of India will increase up to 1619 Million in 2050 with increased GDP and per capita food spending. As Spices are of high value with Nutraceutical compounds, its per capita may increase many fold by 2050 (Table-ES.1 below). The projected per capita demand for major spices like Black Pepper, Cardamom, Ginger and Turmeric is estimated to be about 148g, 53g, 1.22 kg and 1.63 kg respectively. With this increase, production level to meet the local and global demand is estimated to be increased by 2.7 – 5.7 folds from the present levels.

Table-ES.1: Demand projection of major Spices for 2030 and 2050

Crop	2030		2050	
	Consumption Demand (MT)	Productivity requirement*	Consumption Demand (MT)	Productivity requirement*
<b>Black Pepper</b>	181.43	1335	239.25	1760
<b>Ginger</b>	1528.8	9504	2152.5	13381
<b>Turmeric</b>	1522.9	6791	2882.2	12809
<b>Cardamom</b>	38.8	404.2	79.1	823.9

Source: ICAR Indian Institute of Spice Research Annual Report 2019(\*Assuming area under cultivation remains constant at 2017-18 level)

India's present share in world trade of spices is about 40-50% in terms of volume and 25% in terms of value. Thus, India's demand and supply play an important role in the world's market.

**13.0** India is the hub for manufacturing and export of spice oils & oleoresins in the international market retaining more than 80% share in the global market. The demand for high end value added product of spices such as spice oils and oleoresins in domestic market is very less. Spice oils/ oleoresins manufactured in India are mostly exported to the Industrial consumers in developed countries. Export of spice oils/ oleoresins from India during the period from 2015-16 to 2019-20 are given below:

Table-ES.2: Export of spice oils/ oleoresins

Year	Exported (MT)	Value of Export (Rs in Lakh)
<b>2015-16</b>	11635	214255.00
<b>2016-17</b>	12100	245532.80
<b>2017-18</b>	17200	266172.39

<b>2018-19</b>	12750	219300.00
<b>2019-20</b>	13950	264525.00

The export of Spices' extract has shown an increase of 9% in volume and 21% in terms of value during 2019-20 compared to 2018-19. USA is the major buyer of spice oil / oleoresin from India. The other leading buyers are China, France, Germany and UK.

**14.0** The NER has the honour of having the world's best variety of Turmeric having highest Curcumin content variety of turmeric- Lakadong & Megha; very high pungent Chillies (the Naga chilli), Bird's eye chilli (MizoChilli), Dallekhursani (round chilli); BhutJalakia, organic Black pepper, less fiber content variety of ginger-Nadia and high quality Bay leaves (Tejpatta). The region is also potential source of Cinnamon, Aniseed, and Long pepper. Spices of NER with Geographical Indication (GI) tag help the producers in a big way for branding, marketing and protecting the exclusive, special local crops as an identity of the products. Among the spices, Large Cardamom and Ginger are the largest item produced in North Eastern region accounting for more than 85 % and 46 % of the production respectively in the country. Among the NE States, Assam is the major contributor with almost 50% of the area and production of spices in NER. Large cardamom, ginger, turmeric, chilli, pepper, bay leaf, organic spices are some of the important spices which are exported / sourced for export from NE region.

Spices grown in NER have intrinsic value and hold vast potential in industrial and pharmaceutical sector. NER spices has high market demand for their unique features and organic in nature. Although, the spice crops are currently marked as a major important crop and have played an important role in contributing rural livelihood cash income, but awareness of commercial cultivation is still low. These crops are mostly grown by the farmers in NER mainly for domestic use.

Besides the traditional spices, there is tremendous scope for cultivation of exotic spices like vanilla, oregano, sage, basil, rosemary, thyme etc. in NER as the region is blessed with ideal soil and climatic conditions. Varied agro-ecological zones from foothill to alpine zone prevailing in NER provides favourable niche for growth and commercial cultivations of various spices in NER.

**15.0** Although there are some primary/assembling markets in NER for large Cardamom, but with regard to other spices, there are no organized markets in NE region. Siliguri is the major domestic and international market for large cardamom wherein the large cardamom produced in all growing states as well as bordering countries viz. Nepal and Bhutan arrives for trading. In case of annual spices viz. ginger and turmeric, farmers resort to distress sale of fresh produce at low price due to higher arrivals at the peak season. The farmers do not have adequate storage / value addition facilities. Presence of middlemen in the supply chain is also a major concern in marketing of spices in NE region. The upcoming FPOs in major spices growing areas in NE region have a greater role to play in improving supply chains and better price realization to the spice growers.

**16.0** In present day scenario, availability of post-harvest and processing infrastructure as well as value addition of spices are found minimal and farmers are forced to sell their fresh/raw produces at low prices. Though there is huge potential for the processing industry as in the present scenario, status of Spices processing industry is in its infancy in the region and most of the products are marketed either raw or semi-processed stage resulting in low income to the producers. However, few processing facilities set up by the Government or other agencies are running at a low key. A list of existing processing units in NER is given in **Annexure-7** at Page No. 167.

**17.0** The Spices Board of India has taken initiative towards the development and worldwide promotion of Indian spices. The board provides quality control and certification, registers the spice exporters, documents the trade information and provides inputs to the central government on policy matters. Spices Board has established two Regional Offices (RO) in NE Region one each at Guwahati and Gangtok for initiating action for formation of Spice Development Agency (SDA) for effective implementation of various programmes of the Board in co-ordination with the concerned State Governments.

For development of large cardamom, Spices Board is providing various financial assistance to growers under its programme for replantation / new plantation, production and supply of quality planting materials

through certified nurseries in growers' field, development of irrigation facilities, installation of improved curing system (dryer) and improvement of post-harvest management viz. assistance for installing post-harvest equipment viz. Pepper threshers, turmeric boilers, turmeric polishers, etc in NE region.

**18.0** Govt. of India is currently implementing various schemes in order to support the development on horticulture/agriculture in NER. Mission for Integrated Development of Horticulture (MIDH) and Mission Organic Value Chain Development of North Eastern Region (MOVCDNER), Rashtriya Krishi Vikash Yojna (RKVY) etc. are the most important ongoing schemes of Govt. of India currently implemented in all eight North Eastern states.

MOVCDNER is a flagship mission launched by the Ministry of Agriculture & Farmers Welfare; Govt. of India for promoting agri value chain for organic farming in eight states of NER. The scheme aims to promote the development of certified organic production in North Eastern Region in a value chain mode. In this scheme emphasis has been given to link growers with consumers and to support the development of entire value chain starting from inputs, seeds, certification, creation of facilities for collection, aggregation, processing marketing and brand building initiative. Under this scheme financial assistance is being provided for production, post-harvest, processing, marketing & brand building of organic spices. Organic cluster of spices especially ginger, turmeric, chili & large cardamom through FPC/FPOs has been developed in all NER states.

**19.0** In the process of preparation of this Action Plan, various key stakeholders starting from all relevant Govt. Departments of all NER states, Spices Board of India, major market players, processor, exporter, farmers, progressive farmers, FPO/FPCs etc. who are closely associated with the spices sector were consulted/interacted to understand the various challenges faced by them. The study team organized virtual stakeholders' meetings, meeting with the State Government officials in person wherever possible, contacting farmers and farmer producer companies/farmers producer organization, spice processing unit, exporter, leading market player etc. to integrate the feedback and suggestions based on their experience in spices sector.

The proposed Action Plan is prepared after considering all stakeholders' views, inputs & suggestions which were shared based on their experience. Major challenges faced by the stakeholders in backward linkage development, post-harvest management, forward linkage development, in logistics and challenges in quality are also incorporated in **Chapter-III** of this report. Limited volume of production, absence of mechanized production processes, lack of aggregation facilities, lack of post harvest and processing facilities, inadequate market linkage, higher transportation cost, poor connectivity etc are the major challenges faced by the stakeholders.

Insufficient mechanization is a major limiting factor for post-harvest operation and primary processing in the spices sectors in the region which leads to force selling of spices in raw or fresh form to the middle man or aggregator or in the local market at a low price. Lack of sufficient primary processing infrastructure is one of the reason for inadequate supply of quality & standard of dried materials to the tertiary spice processing unit of the NE region and farmers are not getting a premium price on their farm produced. In present scenario, Spices processing industry is found to be in the juvenile stage. All the produces are mostly sold out at raw or semi-processed stage resulting in low income to the producer. Vast potential for development of the processing industry as well as other value chain infrastructure of spices exist in NER.

The interactions with the key stakeholders provided ground level feedback and suggestions for developing effective value chain for spices in the region. Considering the above challenges faced by the different stakeholders, the proposed action plan on value chain development of spices is being prepared. Provision has been made for the development of infrastructure in backward linkage, post-harvest & processing, forward linkages and for the value chain support system.

**20.0** Spices of NER occupy a distinct place in global trade due to its unique characteristics of high aroma, flavour, volatile oil, bio active components etc. Value addition of these spices is a very important aspect which ultimately helps in targeting various market segments of spices to earn better profit.



For the present value chain, NER spices are grouped into major and minor spices based on their availability, usage, importance and demand. Considering the availability, USP of NER spices, future prospects of value addition to get higher return, techno commercial viability, farmer empowerment, rural livelihood development and export development etc, the study team selected some major and minor spices of NER. Scope for increasing area & productivity under emerging spices to increase livelihood of the farmers are also considered while selecting the focused crops. The following existing & emerging spices are identified for NER region to develop complete value chain.

Table-ES.3: Selected focused spice crops in NER

Existing spices are considered for NER Value chain	Spices/herbs are also considered for NER Value Chain
Turmeric: Lakadong Turmeric, Black Turmeric (Curcuma Caesia), Megha turmeric Ginger: Nadia, Black Ginger (Kaempferia Paviflora) Chilli: Bird Eye Chilli, Bhut Jalakia, Naga King Chilli Large Cardamom Black Pepper Long pepper Cinnamon Bay leave Onion Garlic	Vanilla Oregano Thyme Rosemary Sage Basil

**Chapter–IV** in this report provides detailed information on the spices to be promoted in the NER states.

**21.0** Value chain in Agriculture is the invisible part of AGRIBUSINESS concept and is interconnected from FARMER to CONSUMER with number of steps, stages and is connecting number of stake holders adding value to basic agro produce. Agribusiness is an important aspect and the base to design value chains. The driving forces for Agribusiness concept are:

- Future needs of the domestic and global market
- Changing life-style and diet/food habits
- Safe food
- Traceability
- Nutritional Profile

Value chain development of spices helps in converting the raw spices to extremely high value-added product or an ingredient with the help of technology. The value-added products can be marketed globally and can earn good profits. All stake holders in the value chain will get satisfactory returns from the value chain. Redeployment of profits for rural and farmer empowerment is easily possible, which will increase the yield and improve the quality of raw material.

Components wise key stakeholders of Spice Value Chain are provided below.

For Raw Material – spice production	Individual farmers, FPOs and FPCs
For Post-Harvest Sector	Government agencies, SPVs, entrepreneurs, and FPCs/FPOs, investors
Spice Processing	Entrepreneurs, research community, food safety agencies, logistics agencies,
Forward Integration	Organized supply chain, distributors, online portals, e commerce portals, shops, MLM companies, government agencies, exporters

Hi-Tech Nursery, Organic manure unit, organic liquid fertilizer and vermicompost unit are some of the value chain infrastructure required for backward linkage development. Various post-harvest & spice processing infrastructure required in the spices value chain are Mobile Collection Centre, Primary Processing Centre (PPC), Common Facility Centre (CFC) /Central Processing Centre (CPC) and Export Facility Centre (EFC). Export Facilitation Centre (EFC) is the innovative concept to promote the Spices and Value added spices products to the Global Market. Export Facility Centre will be designed and set-up considering the locational advantage of the respective NER states.

The success of the value chain depends on the marketing, branding, and monitoring of products with traceability. Product positioning, packaging, product designing, distribution channel and the consistent supply will be the main drivers of the spice value chain. All these issues will be handled, controlled jointly by – NER Value Chain Development Authority and NERAMAC. A special promotional scheme will be designed and implemented on war front to make the project successful.

Understanding post-harvest spice processing technology is another important aspect to be considered while designing the Value Chain development in spice sector. Steam Sterilization of Spices, Cryogenic Grinding, Gamma Ray Sterilization, and Super Critical Extraction by Liquid Carbon Dioxide are advanced Post-Harvest spice processing technologies adopted in the spice value chain. These processes are used mainly in the post-harvest processing infrastructure such as Central Processing Unit and Export Facilitation Centre. Detailed advanced spice processing technology has been incorporated in **Annexure-6** at Page No. 160. All these technologies & plants are compatible for multi commodity processing. **Chapter-V** of this report provides detailed information on the various components and spice processing technologies in value chain.

**22.0 Chapter-VI** of this report deals with the five year holistic value chain development plan for focused and emerging spice crops of NER. State wise year wise plan with basic assumptions of various value chain components for all the eight states of North East Region are prepared and incorporated in the report.

Detailed crop wise value chain component profiles with investment considered while developing the plan are incorporated in **Annexure-5** at Page No. 123.

**23.0** The implementation arrangement and implementation process flow chart of the proposed action plan on value chain development of spice sector in North Eastern Region has been laid out in details in **Chapter-VII** of the report. Considering the practical parameters and to make the proposed value chain completely doable and self-sustainable, single window implementation is recommended through an independent agency which will be either Special Purposed Vehicle (SPV) or Mission to implement the proposed action plan. State level SPV office will be established under regional level (NER level) SPV. The SPV will work as a profit centre and with full capacity to take decisions to implement the project effectively and as per the objectives.

The main stake holders of the SPV are:

- a) M-DONER
- b) Spice Board of India
- c) Private Player from Spice Sector
- d) Independent Advisory Firms
- e) NBFC/Financial Institutes /Private Equity Firms

SPV state office will be led by CEO who is responsible for profitability and Self Sustainability

**24.0** Total regional plan outlay for the proposed action plan for value chain development of spice sector in NER is estimated at Rs. 3722.03 Crores over the 5 year term. Detailed state wise fund outlay is given in **Chapter-VIII** of this report. A summary of total fund requirement with sources are given below.

Table-ES.4: Regional Summary of Financial Outlay in NER

(INR in Crores)

No	Particulars	Arunachal Pradesh	Assam	Meghalaya	Mizoram	Manipur	Nagaland	Sikkim	Tripura	Total	Existing Schemes
<b>I. Backward Linkage Development</b>											
<b>A. New Farm Development</b>	Investment in New Farm development	400.00	465.00	244.00	260.00	235.00	140.00	135.00	135.00	<b>2014.00</b>	<b>RKVY/ MIDH/</b>
	Organic Certification Exp. & Renewal Fees	21.05	23.16	10.88	15.44	11.93	7.02	1.96	6.32	<b>97.76</b>	<b>New Scheme</b>
<b>B. Agri Inputs &amp; Support System</b>	Hi tech Nursery	5.00	6.80	1.00	0.80	1.20	1.20	0.80	1.60	<b>18.40</b>	<b>RKVY/ MIDH/</b>
	Organic Manure Unit	20.00	30.00	10.00	8.00	8.00	10.00	4.00	4.00	<b>94.00</b>	
	Organic Pesticide Unit	20.00	30.00	10.00	8.00	8.00	10.00	4.00	4.00	<b>94.00</b>	
	Vermi Compost Unit	1.00	2.04	0.44	0.32	0.52	0.48	0.16	0.32	<b>5.28</b>	
<b>Sub Total (I)</b>		<b>467.05</b>	<b>557.00</b>	<b>276.32</b>	<b>292.56</b>	<b>264.65</b>	<b>168.70</b>	<b>145.92</b>	<b>151.24</b>	<b>2323.44</b>	
<b>II. Post-Harvest Infrastructure</b>											
1	<b>Mobile Collection Centers (MCC)</b>	20.00	44.40	14.80	9.60	8.00	10.00	12.80	9.20	<b>128.80</b>	<b>MIDH/ RKVY/ KISSAN SAMPADHA</b>
2	<b>Primary Processing Centers (PPC)</b>	39.06	117.66	50.79	33.88	28.18	31.49	29.05	18.18	<b>348.29</b>	
3	<b>Central Processing Unit (CPC)</b>	25.59	33.77	8.27	8.27	8.27	8.27	8.27	8.27	<b>108.99</b>	
4	<b>Export Facility Centre (EFC)</b>	46.86	122.77	0.00	0.00	0.00	0.00	0.00	0.00	<b>169.63</b>	
<b>Sub Total (II)</b>		<b>131.51</b>	<b>318.60</b>	<b>73.86</b>	<b>51.75</b>	<b>44.45</b>	<b>49.76</b>	<b>50.12</b>	<b>35.65</b>	<b>755.70</b>	
<b>III. Marketing Expenses</b>		71.83	105.07	42.01	41.32	37.09	26.22	23.52	22.43	<b>369.49</b>	<b>New Scheme</b>
<b>Sub Total (III)</b>		<b>71.83</b>	<b>105.07</b>	<b>42.01</b>	<b>41.32</b>	<b>37.09</b>	<b>26.22</b>	<b>23.52</b>	<b>22.43</b>	<b>369.49</b>	
<b>Total Spice Value Chain Investment for NER</b>		<b>670.39</b>	<b>980.67</b>	<b>392.19</b>	<b>385.63</b>	<b>346.19</b>	<b>244.67</b>	<b>219.56</b>	<b>209.32</b>	<b>3448.63</b>	
Capacity building of farmers		4.00	8.00	4.00	4.00	4.00	4.00	2.00	2.00	32.00	<b>New Scheme</b>
Monitoring expenses @2% of the Total Value chain investment		13.41	19.61	7.84	7.71	6.92	4.89	4.39	4.19	68.97	<b>New Scheme</b>
Administrative expenses @5% of the total value chain investment		33.52	49.03	19.61	19.28	17.31	12.23	10.98	10.47	172.43	<b>New Scheme</b>
<b>Grand total investment of Value Chain in NER</b>		<b>721.32</b>	<b>1057.32</b>	<b>423.64</b>	<b>416.62</b>	<b>374.43</b>	<b>265.80</b>	<b>236.93</b>	<b>225.97</b>	<b>3722.03</b>	

Table-ES.5: Year-wise Regional Summary of Financial Outlay in NER

(INR in Crores)

No	Particulars	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
<b>I. Backward Linkage Development</b>							
<b>A. New Farm Development</b>	Investment in New Farm development	531.50	909.00	466.00	107.50	0.00	<b>2014.00</b>
	Organic Certification Exp. & Renewal Fees	8.34	18.63	19.94	17.27	33.58	<b>97.76</b>
<b>B. Agri Inputs &amp; Support System</b>	Hi tech Nursery	18.40	0.00	0.00	0.00	0.00	<b>18.40</b>
	Organic Manure Unit	50.00	44.00	0.00	0.00	0.00	<b>94.00</b>
	Organic Pesticide Unit	50.00	44.00	0.00	0.00	0.00	<b>94.00</b>
	Vermi Compost Unit	5.28	0.00	0.00	0.00	0.00	<b>5.28</b>
<b>Sub Total (I)</b>		<b>663.52</b>	<b>1015.63</b>	<b>485.94</b>	<b>124.77</b>	<b>33.58</b>	<b>2323.44</b>
<b>II. Post-Harvest Infrastructure</b>							
1	<b>Mobile Collection Centers (MCC)</b>	33.20	55.20	31.60	8.80	0.00	<b>128.80</b>
2	<b>Primary Processing Centers (PPC)</b>	103.56	131.35	113.38	0.00	0.00	<b>348.29</b>
3	<b>Central Processing Unit (CPC)</b>	0.00	11.26	97.73	0.00	0.00	<b>108.99</b>
4	<b>Export Facility Centre (EFC)</b>	0.00	0.00	75.92	93.71	0.00	<b>169.63</b>
<b>Sub Total (II)</b>		<b>136.76</b>	<b>197.80</b>	<b>318.63</b>	<b>102.51</b>	<b>0.00</b>	<b>755.70</b>
<b>III. Marketing Expenses</b>		73.90	73.90	73.90	73.90	73.90	<b>369.49</b>
<b>Sub Total (III)</b>		<b>73.90</b>	<b>73.90</b>	<b>73.90</b>	<b>73.90</b>	<b>73.90</b>	<b>369.49</b>
<b>Total Spice Value Chain Investment for NER</b>		<b>874.18</b>	<b>1287.33</b>	<b>878.47</b>	<b>301.18</b>	<b>107.48</b>	<b>3448.63</b>
Capacity building of farmers		6.40	6.40	6.40	6.40	6.40	32.00
Monitoring expenses @2% of the Total Value chain investment		17.48	25.75	17.57	6.02	2.15	68.97
Administrative expenses @5% of the total value chain investment		43.71	64.37	43.92	15.06	5.37	172.43
<b>Grand total investment of Value Chain in NER</b>		<b>941.77</b>	<b>1383.84</b>	<b>946.36</b>	<b>328.67</b>	<b>121.40</b>	<b>3722.03</b>



Table-ES.6: Year-wise break-up of total fund allocation in NER

(INR in Crores)

Head of expenditures	Share / Sources	Year-1	Year-2	Year-3	Year-4	Year-5	Total
A.1) Investment for marketing, branding & quality monitoring	100% Govt.	73.90	73.90	73.90	73.90	73.90	369.49
A.2) Capacity Building of farmers/FPOs/FPCs	100% Govt.	6.40	6.40	6.40	6.40	6.40	32.00
A.3) Monitoring & Review @2% of Total Infrastructure cost	100% Govt.	17.48	25.75	17.57	6.02	2.15	68.97
A.4) Administrative expenses @5% of Total Infrastructure cost	100% Govt.	43.71	64.37	43.92	15.06	5.37	172.43
A.5) Organic Certification Cost	100% Govt.	8.34	18.63	19.94	17.27	33.58	97.76
<b>Sub-Total (A)</b>		<b>149.83</b>	<b>189.04</b>	<b>161.73</b>	<b>118.66</b>	<b>121.40</b>	<b>740.65</b>
B.1) Post-harvest infrastructure	50% Govt.	136.76	197.80	318.63	102.51	0.00	755.70
B.2) Backward linkage infrastructure	50% Govt.	123.68	88.00	0.00	0.00	0.00	211.68
B.3) New Farm Development	50% Govt.	531.50	909.00	466.00	107.50	0.00	2014.00
<b>Sub-Total (B)</b>		<b>791.94</b>	<b>1194.80</b>	<b>784.63</b>	<b>210.01</b>	<b>0.00</b>	<b>2981.38</b>
	50% Govt.	395.97	597.40	392.31	105.01	0.00	1490.69
	40% Bank credit	316.78	477.92	313.85	84.00	0.00	1192.55
	10% Owner contribution	79.19	119.48	78.46	21.00	0.00	298.14
<b>Govt. sources</b>	<b>Bank Credit</b>	<b>Owner contribution</b>			<b>Total investment</b>		
<b>2231.34</b>	<b>1192.55</b>	<b>298.14</b>			<b>3722.03</b>		

## 25.0 Chapter-IX of the report deals with the expected outputs and outcomes of this plan.

### Major outcomes envisaged are listed below-

- **Area Expansion & Organic Certification:** Total **1,45,500 Ha** area is proposed for development of new farm with increase in productivity under spice crops in NER. Provision has been made for organic certification of the proposed area. Therefore over a period of 5 years, organic certified area in NER under spice crops will be increased.
- **Creation of Post-Harvest Processing & Value Addition Facilities:** Value added products of spices are the real outcome of the proposed Action Plan. Supply chain development, traceability, organic certification to product and facilities will be possible with implementation of this Action Plan. It will be offering products of International standard (e.g. ASTA, ESU certified /compliance products) to the global and domestic market.  
Creation of Post-Harvest processing & Value Chain facilities (both post-harvest as well as backward infrastructure & Value Chain support infrastructure) will give satisfactory returns to all stakeholders involved in the Value Chain. It is expected that **362693.04 MT** of finished goods will be processed and handled by the proposed value chain in NER.
- **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 provision for generation of both direct and indirect employment from the value chain activities. Total **643891** nos. of employment (both direct & indirect) will be generated from the proposed value chain activities.
- **Income Generation:** Doubling farmers' income by increase in yield, value addition and entering into global market. Export Facility Center will be the center to boost Spice Export. Products from Value added Units can also be exported 100% by which the nation will earn foreign currency. Approx. **Rs. 603.41 Crore/ annum** income will be generated by the SPV.
- **Capacity Building of Farmers:** The structure of value chain will empower farmers, offer safe products to consumers and wealth creation at rural, semi urban and urban level.
- **Revenue return to the Government:** Approx. **Rs.108.61 Crore /annum** of revenue will be generated in the form of GST (on Job Work basis).

### Other outcomes of the plan are-

- Increase production and bulk export of organic value added spices/ spice products from NER.
- Import substitution.
- Increase interest of the farmers in agriculture and also reduce migration from agriculture sector with improvement in Growers'/Farmers' income.

### Socio Economic impact of the plan:

Table-ES.7: New Spice farm development & Employment Generation in NER

No	States	farm Development(Ha)	Employment generation(nos)	Value Chain Infrastructure(INR Lakh)
1.	Arunachal Pradesh	30000	137506	67039.39
2.	Assam	33000	140827	98067.47
3.	Meghalaya	15500	66590	39219.76
4.	Mizoram	22000	99186	38562.74
5.	Manipur	17000	74067	34619.26
6.	Nagaland	10000	45043	24467.30
7.	Sikkim	9000	39861	21956.25
8.	Tripura	9000	40811	20931.71
	<b>Subtotal</b>	<b>145500</b>	<b>643891</b>	<b>344863.88</b>

Table-ES.8: Income generation & Return to the Government

No	States	Arunachal Pradesh	Assam	Meghalaya	Mizoram	Manipur	Nagaland	Sikkim	Tripura	Total
	<b>PHP Facilities</b>									
1.	<b>Finish Goods Processed and Handled</b>	51459 MT	130027 MT	38177 MT	31652 MT	32492 MT	31652 MT	21106.20 MT	26127.84 MT	<b>362693.04 MT</b>
2.	<b>Income Generation by Job work and services to SPV in INR Lakh</b>	7105.23	15058.91	08742.15	6251.50	7384.78	7687.00	4636.87	3474.60	<b>60341.04 Lakh</b>
3.	<b>GST Collected by SPV in INR Lakh</b>	1278.93	2710.60	1573.58	1125.27	1329.26	1383.36	834.63	625.42	<b>10861.05 Lakh</b>