



Business Case for Spices Production & Processing

in Meghalaya, Mizoram, Nagaland
and Uttarakhand

2018



sustainable spices
initiative - India

TITLE	Business Case for Spices Production & Processing in Meghalaya, Mizoram, Nagaland and Uttarakhand																										
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MESSAGE



India has always been a key player in the spice trade and continues to be one of the primary origins for spices for the global market, and at the same time, equally important to the domestic market as the largest consumer of its home-grown spices.

Today, the spices sector in India is affected by many issues such as overuse of agrochemicals (affecting food safety), unscientific soil and nutrient management and unsafe practices in cultivation resulting in poor health of farmers and their labour. To address these challenges, we require a strategic, inclusive and aligned intervention from all key stakeholders in the sector. This requires advocacy and dialogue with governments, input suppliers and technology providers, supported by international and domestic market buyers.

The Sustainable Spices Initiative India (SSI-I), powered by IDH the Sustainable Trade Initiative, is an industry-led, voluntary, multi-stakeholder platform established as a Section 8, not-for-profit organization, with a mission to make 25% of Indian spices sustainable by 2025.

SSI-I is working with its partners in the private sector who are committed towards securing sustainably grown spices. We count amongst our members, frontrunner organizations such as Griffith Foods, Nestle, ITC, NANI, NEDSPICE, Synthite, Jayanti, Kancor Mane, Akay, Olam and WSO. The supply of sustainably produced spices is made possible by our implementation partners who facilitate the adoption of the SSI-India package of sustainable practices across the farm projects.

The core focus for SSI-I is food safety and security, good health and well-being of the producer community, natural resource management and proactive farming systems.

In India, the North-Eastern states and Uttarakhand have conducive geo-climatic conditions to not only maintain, but grow in their traditional cropping patterns which include a variety of high quality spices. On the flip side, inadequate infrastructure and distribution networks, lack of processing facilities, and the absence of a commercial approach towards cultivation have limited these States from emerging as major sources of spices.

SSI-I and IDH are working together on “service delivery models” that establish a viable value proposition for a stakeholder (or a group of stakeholders) to engage directly with spice farmers - providing them access to a suite of services including finance, inputs, agri extension and training, warehousing and market access – resulting a win-win for the service(s) provider and the producer, and an increased supply of sustainably grown spices.

In this report ‘Business Case for Spice Production and Processing’, challenges and opportunities in spice production and processing in North Eastern States and Uttarakhand have been explored. This report provides a foundation for identifying the business opportunity for MSMEs, agri-entrepreneurs and farmers’ groups in the sector. SSI-I (powered by IDH) would like to thank the International Fund for Agricultural Development (IFAD) for bringing to your notice the potential for spice farming and business opportunities in North East Region and Uttarakhand.

I hope that this report provides a deeper insight into the significant business opportunity in Uttarakhand and the North Eastern States, by addressing the sustainability issues in spices production, and I believe that it will give the reader a fresh perspective on how the private sector can bring about a step change in transforming the spices sector by partnering with the producers to offer a food-safe, environmental friendly, socially conscious, quality offering to the Indian and international consumers alike.

Pramit Chanda

Director- Sustainable Spices Initiative-India
Country Director IDH the sustainable trade initiative

FOREWORD



India is bestowed with rich biodiversity, varied agro climatic zones and diverse flora and fauna. Moreover, certain regions (especially the North East Region & Uttarakhand) are unique in terms of “Natural Cultivation” due to negligible use of chemical inputs. The region has tremendous potential particularly in horticulture, floriculture, plantation and fisheries as also is naturally amenable to certified organic farming. One of the key sub-sectors that emerges as a promising opportunity in the region is Spices- the region produces nearly 0.8 Mn MT of a diverse basket of spices, accounting for around 12% of the country’s production. The spices are naturally grown, without chemicals and contain high levels of active ingredients.

However, the region is unable to fully harness this potential due to a number of constraints such as difficult terrain, use of traditional and outdated methods of production, unavailability of organic inputs, lack of institutionalized market linkages, low production volumes, lack of technical know-how, limited aggregation, certification challenges, dominance of large number of intermediaries in the value chain, inadequate value addition, marketing & logistics infrastructural bottlenecks and insufficient credit facilities.

Growing awareness for safe and healthy food among consumers (both domestically in India as well as internationally) has been an apt enabler of increasing prevalence of sustainability as a scalable & profitable way of farming. Business planning for the Spices sector in the NER and hilly region needs to be based on a holistic strategy to create a favorable environment by making available the infrastructural facilities and hard/ soft market linkages necessary for enhanced economic productivity and improved sustainable agricultural development. Producers need to be integrated with the value chain, so that information asymmetry is minimized and farmers are able to realize a better price for their produce.

In order to ascertain the potential of production & processing of spices in the North East Region (specifically in Meghalaya, Mizoram and Nagaland) along with the hill state of Uttarakhand, and to suggest a scalable and market driven way forward, YES BANK in association with IDH conducted an extensive study on establishing a “Business Case for Production and Processing of Spices” in the identified states. The report provides strategic recommendations for spices sector to augment sustainable production practices, value addition, marketability and branding from the identified states. I am confident that the contents of this publication will serve as a useful reference for the industry and prospective investors for planning a range of initiatives in the Spices sector in the identified geography.

Nitin Puri

Senior President & Global Head

Food and Agribusiness Strategic Advisory & Research (FASAR)

YES BANK Ltd.



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Abbreviations

APEDA	The Agricultural and Processed Food Products Export Development Authority
B2B	Business to Business
Bn	Billion
CAGR	Compound Annual Growth Rate
CDAR	Community Development Action and Reflection
CFC	Common Facility Centers
CHC	Custom Hiring Centre
CIPHET	Central Institute of Post-harvest Engineering & Technology
DGFT	Directorate General of Foreign Trade
FiBL	German: Forschungsinstitut für biologischen Landbau
FPCs	Farmer Producer Companies
FPOs	Farmer Producer Organizations
FSSAI	Food Safety and Standards Authority of India
FYM	Farm Yard Manure
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
Ha	Hectare
HDPE	High-density polyethylene
HYV	High Yielding Variety
ICAR	The Indian Council of Agricultural Research
ICCOA	International Competence Centre for Organic Agriculture
INR I	Indian National Rupee
ISO	International Organization for Standardization
ITC	International Trade Centre
JAS	Japanese Agricultural Standard
KVK	Krishi Vigyan Kendras
MDoNER	Ministry of Development of the Northeastern Region
MIDH	Mission for Integrated Development of Horticulture

Abbreviations

Mn	Million
MoAFW	Ministry of Agriculture and Farmers' Welfare
MoFPI	Ministry of Food Processing Industries
MOVCD-NER	Mission Organic Value Chain Development for North East Region
MT	Metric Tonne
NABARD	National Bank for Agriculture & Rural Development
NEC	North Eastern Council
NeDFI	North Eastern Development Finance Corporation Limited
NER	North Eastern Region
NERAMAC	North Eastern Regional Agricultural Marketing Corporation Limited.
NGO	Non-governmental organization
NHB	National Horticulture Board
NIDC	The Nagaland Industrial Development Corporation Limited
NLUP	New Land Use Policy
NMSA	National Mission of Sustainable Agriculture
NOP	National Organic Program
NPK	Nitrogen, Phosphorous and Potash
NPOF	National Project on Organic Farming
NPOP	National Programme for Organic Production
NSOP	National Standards for Organic Production
NSSO	National Sample Survey Office
PGS	Participatory Guarantee System
PKVY	Paramparagat Krishi Vikas Yojana
SAMPADA	Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters
SAP	Sustainable Agricultural Practices
SAU	State Agriculture University
USDA	The United States Department of Agriculture
YBL	YES BANK Limited



1. Introduction to the Study

The North East Region (NER) of India, comprising of ‘Seven Sister’ states namely Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura along with Sikkim holds immense opportunity, resources and unexplored potential when it comes to agriculture and horticulture. This expanse is blessed with stunning biodiversity, optimal agro climatic conditions, water resources, forest wealth, fruits, herbs & aromatic plants, manpower as well as a geographically strategic location acting as a Gateway to the South East Asian countries and China. This makes the North-East a prospective hub of international trade and commerce.

However, it is for all to see that this potential has not been exploited suitably which is evident by numerous factors such as low contribution to national Gross Domestic Product (GDP), high unemployment, meagre exports and overall underutilization of monetary and natural resources. This is especially relevant to categories such as organic produce in spices, ornamental plants as well as horticultural produce.

To gain insights into probable end-to-end viable business case specifically for spices, which fetches a remunerative price based on quality in India as well as in the global market, it is imperative to understand in detail the bottlenecks for tapping the true potential of NER/Uttarakhand and thereby prepare a comprehensive and actionable road map taking into consideration all the stakeholders involved.

1.1 Objectives

- Develop a business case for a viable spices processing facility considering the market, locational advantage and production in the NER/Uttarakhand.
- Identifying the most promising spices products that are available in NER and which offer huge export potential.
- Mapping the existing situation of production, organic farming and production clusters, processing, infrastructure, exports, government support etc. of each of the identified products.
- Assessing viability of going ‘organic’ and whether it is a viable proposition especially for creating value for farmer.
- Suggesting implementable action plans to counter the challenges and harness the potential of NER.

1.2 Study Region

The identified regions for the study in the North Eastern Region (NER) are the states of Mizoram (MZ), Nagaland (NG) and Meghalaya (MG) in the NER and the Himalayan state of Uttarakhand.

1.3 Scope of Work

Identification of key spice's commodities & shortlisting

- Development of a ranking matrix to identify the key spices based on the parameters namely (but not limited to) current production levels, marketable surplus, current exports from study region, international demand, capacity to absorb high transportation costs, value for organic premium, completion in international markets and others.

Understanding value proposition to farmer for growing 'Organic Spices'

- Assessing probable incentives (social, economic, policy, agricultural) to farmer for adopting organic cultivation practices
- Understanding farmer considerations in shifting from conventional cropping to organic cultivation and price realization
- Facilitate access to market linkages (domestic/international) for off take of organic produce and value added products.
- Development of a crop portfolio which follows Sustainable Agricultural Practices (SAP) and similar standardized processes for cultivation
- Gauge local skill and capacity building, capacity of academic and research institutes, training institutes etc. to support such interventions
- Assessment of all existing policies and schemes in implementation in the study region - their lacunae, recommendations in line with project objectives and key actionable from the Government, private sector and other agencies to boost exports from the study region

Market Opportunity: Domestic vis-à-vis Global

- Assess tangible domestic and exports demand based on data analysis of existing trends including value chain, profitability, value addition opportunity and primary level processability, at a local level. Potential of post-harvest & value addition infrastructure, its cost implications on value chain and realization of remunerative prices in terms of logistics and quality enhancement
- Complexity in manufacturing
- Requirement of labour and technical manpower
- Regulatory compliances
- Comparison with neighboring markets/market leaders – Benchmarking in terms of price build up and assess final benefit to farmer per rupee when compared to global market leaders

Business Case and Export Prospects (Detailed feasibility study and project report for the identified opportunities)

- A project report will be developed which will cover the following:
 - o Indicative Business Plan/Product Mix/Minimum capacity/Infrastructure requirement for a viable model
 - o Financial modeling: Location, Project Cost, Viable Capacity, Investment required and Source of funds/Project Financing, Breakeven costs, Operating assumptions, Manpower requirement, Income statement, Cash Flow statement, Balance Sheet projections, any others.
 - o Indicative Implementation Plan and Timelines

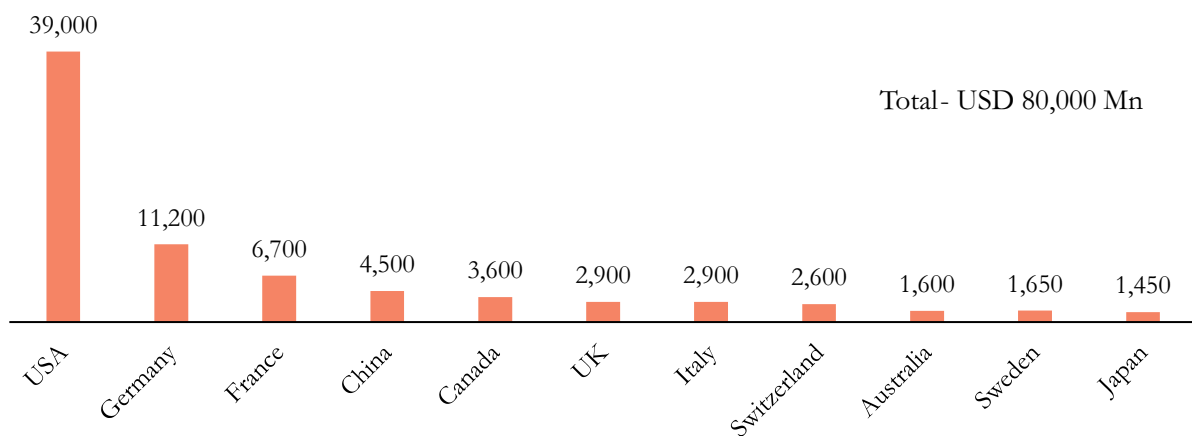


2. The Spices and Organic Sector: An Overview

2.1 The Global and Indian Organic Market: An Overview

- Estimated at USD 80 Bn in 2015, the global organic food market has been growing at a CAGR of around 12% for last 14 years.
- Europe and North America together generate about 90% of the global organic food sales.

Exhibit 1: Global Organic Market Size: Country-wise (in USD Mn)



Source: FiBL (German: Forschungsinstitut für biologischen Landbau)

- Globally, 50.9 million hectares of agricultural land is under organic farming, which accounts for 1.1% of the land under agriculture.
- Globally the key organic crops which occupy the maximum area include grassland/grazing land, cereals, green fodder, oilseeds, protein crops, vegetables, coffee, olives, nuts and cocoa.
- India stands amongst the top 10 countries (9th position) with maximum land under organic farming and has witnessed a significant increase in the organic farmland area in 2014-15.
- The latest estimates by APEDA indicate that the total area under organic cultivation in India including wild area is close to 5.7 million hectare (2015-16). This includes 26% cultivable area with 1.49 million hectare and rest 74% (4.22 million Hectare) forest and wild area for collection of minor forest produces. The area under certification has been on a constant increase witnessing a growth of 7% (CAGR) since 2003.
- India exported around 3 lakh MT of organic products worth USD 370 Mn in 2016-17. The exports of organic products have increased at a CAGR of around 15% in volume terms and 17% in value terms.

India holds the top position in the number of farmers involved in organic agriculture in any country. The number currently stands at more than 0.5 million.

Projections indicate that by 2025, the Indian Organic food business can be worth INR 75,000 crore, a manifold growth from the current level, if the Industry can develop both export & domestic markets. It is estimated that it will generate INR 12,500 crore income per annum for farmers, impacting about 5 Mn farming families across about 6 Mn ha. Another 1 Mn jobs can be created in rural and semi urban areas. India can also earn exchange worth INR 50,000 crores per annum.

Source: Indian Organic Sector: Vision 2025

2.2 Organic Spices

The organic data for commodities is not very well documented across the globe. FiBL collates most of the data for the global organic production and trade, while APEDA does it for India, however commodity-wise/product wise details remain unavailable.

Industry estimates that the size of the global organic spice market is currently valued at close to USD 750 Mn to USD 1 Bn. This is a miniscule portion of the overall USD 80 Bn organic market size. However, from India's perspective this is an important opportunity. Currently India (besides China and Vietnam) is the key exporter of organic spices. Industry estimates that the organic spice segment is dominated by commodities like chili, ginger and garlic.

Though spices form a very miniscule portion of the overall food, the demand for organic spices is ever increasing, especially from food processors (from USA, EU) as they use organic spices as an ingredient to create product differentiation. Besides this, the recognition of medicinal properties of spices have spurred the demand for organic variants.

The demand for organic spices is expected to grow by 5-7% annually, being largely driven by the European market. This demand will be met largely through the South East Asian nations, who have surplus quantum of spices' production and can adhere to the standards of the importing nations.

The Indian organic spice market is also a lucrative opportunity. With increasing disposable incomes and health conscious consumers, the organic market is increasing its outreach. In case of spices, the threat of mixing up of carcinogenic products like colors, chemicals, etc. in the spice powders, has driven the consumers towards choosing organic (or natural) spices. The organic spices easily command a premium of around 30%-40% and in some cases even upto 100% premium at the retail level. At the farm level it is very difficult to map the premium received for organic products, as it varies widely with geography, product, transacting partners as well as market linkage. In the NER, the premium for organic is currently NIL to a minimal premium of around 5-10%, depending on who drives the value chain. The middlemen driven value chain do not pay any premium for organic against conventional crops, while a value chain driven by a local private entrepreneur passes on a premium of around 5-10% to the farmers.

A brief comparison of prices for Conventional vs. Organic Spices at the retail level is provided in the table below:

Exhibit 2: Price Comparison for Conventional and Organic Spices in Indian Retail Market (INR/Kg)

Spice	Conventional	Organic	Premium*
Turmeric Powder	256	400	56%
Ginger powder	560	1000	79%
Chili powder	220	450	105%
Coriander Powder	300	490	63%
Pepper Powder	1520	2010	32%
Whole dried chili	220	450	105%

Source: Grofers, Amazon and other online retail stores, YBL analysis

*The figures depict the premium paid by the consumer at the retail level.

TURMERIC POWDER

Ingredients: TURMERIC POWDER 100 gms - Rs. 40
TURMERIC POWDER 200 gms - Rs. 80

















Usage Suggestions: Add this nature's best healer to impart the golden color to your curries or to hot milk daily.

GROWN WITHOUT SYNTHETIC PESTICIDES & GMOS | PURE | NATURAL COLOUR & TASTE

Category: Spice Powders.

Organic Certifications

A snapshot of conventional and organic Spices available online

<p>47% OFF</p>  <p>Best Value Saunf Seeds</p> <p>200 gm</p> <p>₹50 ₹96</p> <p>Add To Cart</p>	<p>42% OFF</p>  <p>Best Value Black Cardamom Whole/Elaichi</p> <p>50 gm</p> <p>₹80 ₹140</p> <p>Add To Cart</p>	<p>19% OFF</p>  <p>Catch Turmeric Powder/Haldi</p> <p>200 gm</p> <p>₹42 ₹52</p> <p>Add To Cart</p>	<p>21% OFF</p>  <p>Catch Coriander Powder/Dhania</p> <p>100 gm</p> <p>₹22 ₹28</p> <p>Add To Cart</p>
<p>20% OFF</p>  <p>Catch Red Chilli Powder</p> <p>200 gm</p> <p>₹46 ₹58</p> <p>Add To Cart</p>	<p>20% OFF</p>  <p>Catch Hing Powder</p> <p>50 gm</p> <p>₹68 ₹85</p> <p>Add To Cart</p>	<p>10% OFF</p>  <p>Everest Tikhahal Red Chilli Powder</p> <p>100 gm</p> <p>₹26 ₹29</p> <p>Add To Cart</p>	<p>42% OFF</p>  <p>Best Value Black Small Mustard Seeds</p> <p>200 gm</p> <p>₹20 ₹35</p> <p>Add To Cart</p>
<p>10% OFF</p>  <p>24 Mantra Organic Methi Powder</p> <p>100 gm</p> <p>₹36 ₹40</p> <p>Add To Cart</p>	<p>10% OFF</p>  <p>24 Mantra Organic Red Chilli Powder</p> <p>100 gm</p> <p>₹45 ₹50</p> <p>Add To Cart</p>	<p>23% OFF</p>  <p>Organic Tattva Brown Mustard Seeds</p> <p>100 gm</p> <p>₹23 ₹30</p> <p>Add To Cart</p>	<p>10% OFF</p>  <p>24 Mantra Organic Cumin Powder/Jeera</p> <p>100 gm</p> <p>₹63 ₹70</p> <p>Add To Cart</p>
<p>10% OFF</p>  <p>24 Mantra Organic Red Chilli Whole</p> <p>100 gm</p> <p>₹54 ₹60</p> <p>Add To Cart</p>	<p>10% OFF</p>  <p>24 Mantra Organic Coriander Powder/Dhania</p> <p>100 gm</p> <p>₹45 ₹50</p> <p>Add To Cart</p>	<p>25% OFF</p>  <p>Organic Tattva Black Pepper Powder</p> <p>100 gm</p> <p>₹150 ₹200</p> <p>Add To Cart</p>	<p>24% OFF</p>  <p>Organic Tattva Clove Whole</p> <p>50 gm</p> <p>₹143 ₹190</p> <p>Add To Cart</p>

Source: Grofers

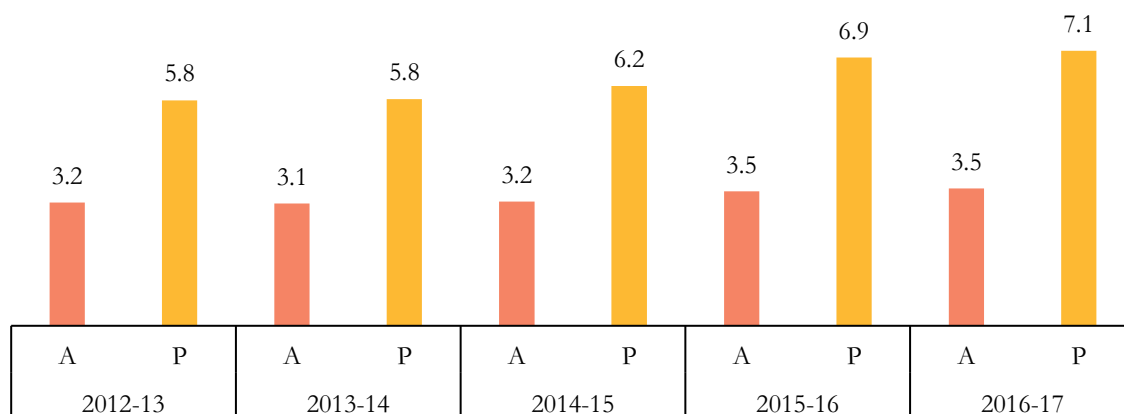
2.3 The Indian Spices' Sector: An Overview

Production

- India is known for its spices not only because of the production quantum and diverse range but also because of their rich aroma, taste and texture.
- The diverse climatic conditions - from tropical to sub-tropical to temperate-almost all spices grow splendidly in India.
- The area and production of spices has seen a constant increase in the last 5 years. Spices have also played a very important role in the economy of India.
- The trade in spices is one of the oldest has been one of the most important forms of commerce. Like the trade of silver and gold, spice trade connected many different civilizations and helped the growth of global contact.
- Today, Indian spices are the most sought-after globally, given their exquisite aroma, texture, taste and medicinal value.
- The country produces about 75 of the 109 varieties listed by the International Organization for Standardization (ISO).

India has the largest domestic market for spices in the world. It is also the world's largest producer and exporter.

Exhibit 3: Trend in Area and Production of Spices in India (2012-13 to 2016-17)



Area in Mn Ha; Production in Mn MT, figures rounded off to one decimal place

Source: Ministry of Agriculture and Farmers' Welfare, 2016-17

The states of Andhra Pradesh, Rajasthan, Gujarat and the North Eastern Region of the country are the major contributors to the spice production in India. The variety of spices grown across these states vary widely- while Andhra Pradesh produces Chili and Turmeric in abundance, Rajasthan and Gujarat produce seed spices and Ginger. The NER on the other hand is rich in Ginger, Turmeric, Chili, Large Cardamom and Bay leaves.

Exhibit 4: Key Spices Growing States in India (2016-17 Est.)

State	Area (in 000Ha)	Production (in 000 MT)
Andhra Pradesh	267	1,050
Rajasthan	970	937
Gujarat	502	868
NER (data available 2015-16)	215	787
Telangana	177	623
Karnataka	225	399
Maharashtra	41	371
West Bengal	128	356
Uttar Pradesh	60	227
Tamil Nadu	107	195
Odisha	112	180
Kerala	160	139
Total	3,529	7,075

Source: Ministry of Agriculture and Farmers' Welfare, 2016-17

Exhibit 5: Leading States in Production of Key Spices in India (2016-17)

Spice	State	Area (000 Ha)	Production (000 MT)	% of India's Production
Pepper	Karnataka	34	31	54%
	Total	131	57	
Cardamom (small)	Kerala	39	15	87%
	Total	69	17	
Cardamom (Large)	Sikkim	23	4	83%
	Total	26	5	
Chilli	Andhra Pradesh	206	883	47%
	Total	830	1,872	
Ginger	Assam	18	166	15%
	Total	164	1,081	
Turmeric	Telangana	50	255	24%
	Total	193	1,051	
Coriander Seed	Rajasthan	214	211	35%
	Total	662	609	

Spice	State	Area (000 Ha)	Production (000 MT)	% of India's Production
Cumin Seed	Gujarat	278	284	58%
	Total	760	485	
Celery Seed	Punjab	4	5	100%
	Total	4	5	
Fennel Seed	Gujarat	40	87	70%
	Total	74	124	
Fenugreek Seed	Rajasthan	150	160	73%
	Total	218	220	
Ajwain Seed	Telangana	1	5	41%
	Total	2	13	
Garlic	Madhya Pradesh	92	405	32%
	Total	274	1,271	
Tamarind	Karnataka	15	70	37%
	Total	49	190	
Cloves	Tamil Nadu	0.9	0.9	79%
	Total	2	1.2	
Nutmeg	Kerala	22	15	98%
	Total	23	15	
Grand Total Pan India		3,529	7,075	-

Source: Spices Board of India

Trade

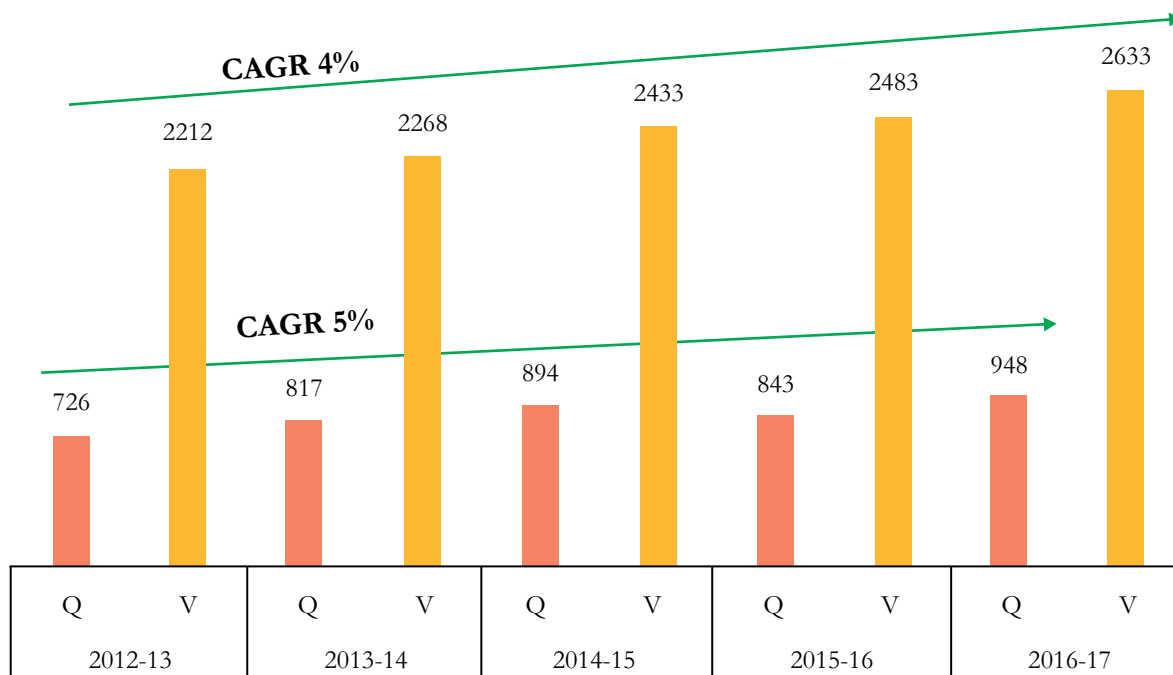
- The spice trade has been an important element in the spread of knowledge and culture. Some historians suggest that the lucrative trade of spices was responsible for many important developments in seafaring and navigation, and the exploration and discovery of many parts of the world, including South Africa.
- The global trade of spices is around USD 10 Bn of which around 18% is contributed by India. The key exporters of spices include India, China and Vietnam.

The Economist asserts, “The history of spices is the history of trade”.

- During 2016-17, a total of 9,47,790 MT of spices and spice products valued INR 17,665 crores (USD 2,633 Mn) was exported from India as against 8,43,255 MT valued INR 16,238 crores (USD 2,483 Mn) in 2015-16 registering an increase of 12% in volume, 9% in rupee terms and 6% in dollar terms.
- As compared to the total export target of spices fixed for the period 2016-17, the total export of Spices has exceeded the target in terms of both volume and value. Compared to the target of 8,70,000 MT valued INR 15,725 crores (USD 2,419 Mn) for the financial year 2016-17 the achievement is 109% in terms of volume and 112% in rupee and 109% dollar terms of value.

The Indian spices exports have been able to record strident gains in volume and value. Spices exports have registered substantial growth during the last five years, registering an average growth rate (CAGR) of 10% in rupee terms and 5% in dollar terms. India commands a formidable position in the World Spice Trade.

Exhibit 6: Growth in Exports of Spices from India



Q=Quantum in 000MT; V=Value in USD Mn

Source: Spice Board of India

- Globally, the key importers of Spices include USA, Germany, India, Vietnam, UK, Netherlands, Spain and France.

Exhibit 7: Key Importing Nations for Spices (2016)

Country	Import Value (USD 000 Mn)
USA	1,701
Germany	773
India	596
Viet Nam	537
France	380
Saudi Arabia	351
United Kingdom	345
Netherlands	338
Japan	338
Spain	303
World	10,401

Source: ITC TradeMap

- The global import of spices is growing at an average annual growth rate of 7%.
- In terms of the value of world trade, pepper, cardamom, ginger, turmeric, capsicum/chili, cinnamon nutmeg/mace, cloves, pimento and vanilla are the most important spice crops from tropical regions and cumin, coriander, sesame seeds, mustard, sage, bay, oregano thyme and mint are the spices crops from the non-tropical regions.
- India largely imports Pepper, Clove, Coriander, Cardamom and some other spices as well. Pepper which constitutes nearly 25% of the total imports, is largely imported from Vietnam, SriLanka, Indonesia, Brazil and China.
- Traceability is becoming an important aspect of the agri value chain specially with respect to trade. For similar reasons, the Spices Board has launched e-Spice Bazaar that will determine the quality and price of their produce for export in the international markets. The e-Spice Bazaar will ensure total integration of all the agencies involved in spices production and exports. The farmers are also helped through technological advice from scientists in universities and other research stations. The e-Spice Bazaar Farmer Traceability Project, being executed with support from the Central Government's Department of Electronics, seeks to incorporate all commercial spices grown in the country, bring spice farmers in the global supply chain with identification of traceability at source, and generate direct linkage with exports to get a premium price.
- The project currently covers 52,000 chili and turmeric farmers in Prakasam and Guntur districts of A.P and Khammam and Warangal of Telangana. In addition to chili and turmeric farmers in these four districts, the portal of the project also has the database of pepper and turmeric farmers from the tribal belt of Vizag and curry leaf growers of Krishna, Guntur and Prakasam districts.



3 Identification/Shortlisting of Key Spices and their Market Assessment

- The 8 north eastern states as well as the state of Uttarakhand are endowed with rich natural resources and suitable agro climate to produce diverse range of crops including spices like pepper, large cardamom, ginger, chili, turmeric etc.
- The greatest advantage of the spices produced in these regions is that they are grown adopting indigenous cultivation practices and are largely organic by default.
- Though the production quantum in these states does not match up to the large states of western and southern India, the intrinsic properties of the spices are well commended by the industry.
- Though the entire north eastern region has ample to offer in terms of spices, the following chapters shall delve deeper into the states of Mizoram, Meghalaya and Nagaland. In addition, state of Uttarakhand is also covered in the study.

Some of the indigenous varieties viz. Nadia in ginger, Lakadong/Megha in turmeric and Birds eye and Naga in chilies are considered rich in essential qualities and are very much preferred by the industry.

3.1 Spice Production in Focus States

Exhibit 8: Key Spices Produced in States under Study –Meghalaya, Mizoram, Nagaland & Uttarakhand

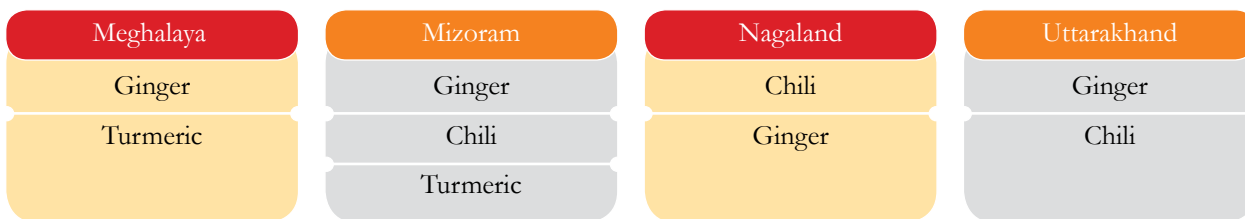
	2012-13		2013-14		2014-15		2015-16		2016-17	
	A=Area in 000 Ha				P= Production in 000 MT					
Commodity	A	P	A	P	A	P	A	P	A	P
Meghalaya										
Ginger	9.44	56.80	9.64	62.99	9.64	62.99	9.9	65.4	9.9	65.4
Turmeric	1.94	9.98	2.17	12.53	2.17	12.53	2.5	15.9	2.5	15.9
Cinnamon	2.4	5.0	2.4	5.0	2.4	5.0	2.4	5.0	2.4	5.0
Chili	1.85	1.41	2.01	1.56	2.01	1.56	2.3	2.1	2.3	2.1
Garlic	0.28	1.11	0.28	1.11	0.28	1.11	0.3	1.1	0.3	1.1
TOTAL	16.9	74.8	17.5	83.9	17.5	83.9	18.4	90.3	18.4	90.3
Mizoram										
Ginger	7.3	28.4	7.3	28.4	7.7	31.2	8.1	31.7	8.1	31.7
Turmeric	6.1	23.0	6.1	23.0	6.4	25.1	7.2	27.8	7.2	27.8
Chili	9.0	8.2	9.0	8.2	9.1	9.3	9.1	9.3	9.1	9.3
TOTAL	22.5	59.6	22.5	59.6	23.3	65.7	24.6	68.9	24.6	68.9
Nagaland										
Ginger	5.3	36.0	5.3	36.0	3.5	52.3	4.5	43.6	4.8	43.6
Chili	0.6	2.5	1.0	6.0	1.2	6.2	0.8	4.7	0.7	4.0
Turmeric	0.5	5.0	0.6	8.5	0.6	10.7	0.6	10.1	0.7	10.7
Garlic	0.1	0.2	0.1	0.2	0.3	2.7	0.3	2.8	0.9	2.9
Cardamom	3.2	1.5	3.2	1.5	3.3	1.5	3.7	1.8	4.2	2.0
TOTAL	9.8	39.2	9.8	39.2	8.9	73.5	10.0	60.8	10.8	63.6
Uttarakhand										
Ginger	2.4	23.4	2.4	23.4	2.4	23.4	2.1	19.6	2.1	19.6
Chili	2.0	7.2	2.0	7.2	2.0	7.2	9.0	7.2	9.0	7.2
Coriander	0.9	3.8	0.9	3.8	0.9	3.8	0.9	3.8	0.9	3.8
Fenugreek	0.4	2.6	0.4	2.6	0.4	2.6	0.4	2.6	0.4	2.6
Garlic	1.1	1.5	1.1	1.5	1.1	1.5	1.3	1.9	1.3	1.9
Turmeric	1.3	2.5	1.3	2.5	1.3	2.5	0.9	1.7	0.9	1.7
TOTAL	8.1	41.1	8.1	41.1	8.1	41.1	14.5	36.9	14.5	36.9

Source: Ministry of Agriculture and Farmers' Welfare, 2016-17, State Horticulture Department

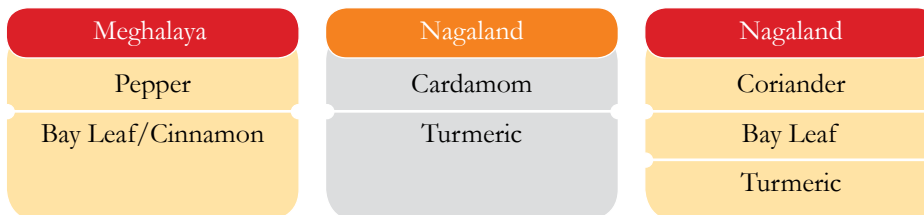
3.2 Shortlisting of Spices

For the purpose of the study, key spices from the 4 states under study have been shortlisted. The parameters for shortlisting considered are summarized below. The detailed methodology for the same is elaborated in Annexure 11.4.

The following are the commodities that have been shortlisted in the states under purview. These shortlisted commodities are the ones, where short term interventions can be implemented for achieving near term results.



Besides these there are few crops which can be developed through medium and long term interventions in these states. These include



3.3 Market Assessment for the Shortlisted Crops

Domestic Consumption Scenario

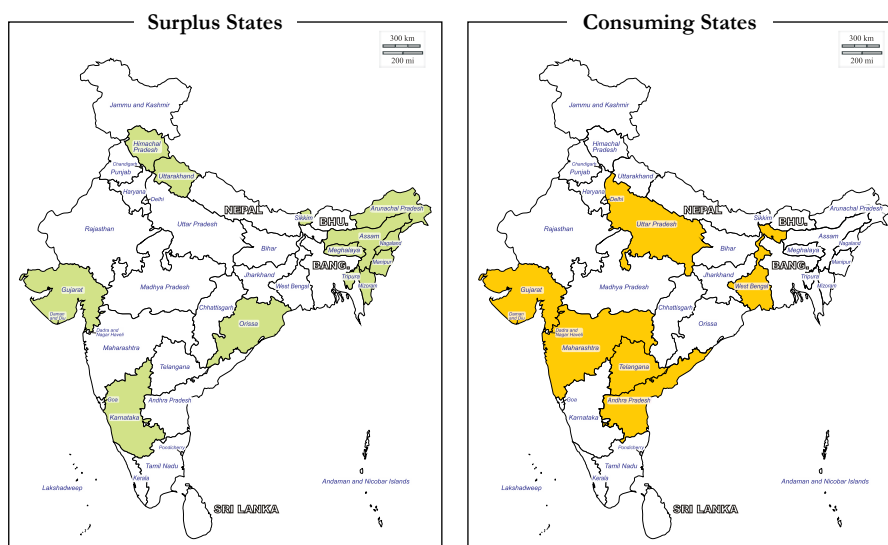
Ginger

- The NER is the ginger surplus region, with all states producing a surplus.
- Besides the NER, Gujarat, Uttarakhand, Karnataka, H.P and Odisha are the ginger surplus states.
- Uttar Pradesh, West Bengal and Maharashtra are the largest consumers of ginger.
- West Bengal is the closest and easily accessible large market available for ginger.

The India average per capita consumption is 57.1 gms for rural areas and 73.3 gms for urban areas.

Mizoram has the highest rural and urban per capita consumption of Ginger which stands at 167.6 gms and 202.2 gms per month.

Exhibit 9: Ginger Surplus States & Highest Ginger Consuming States in India



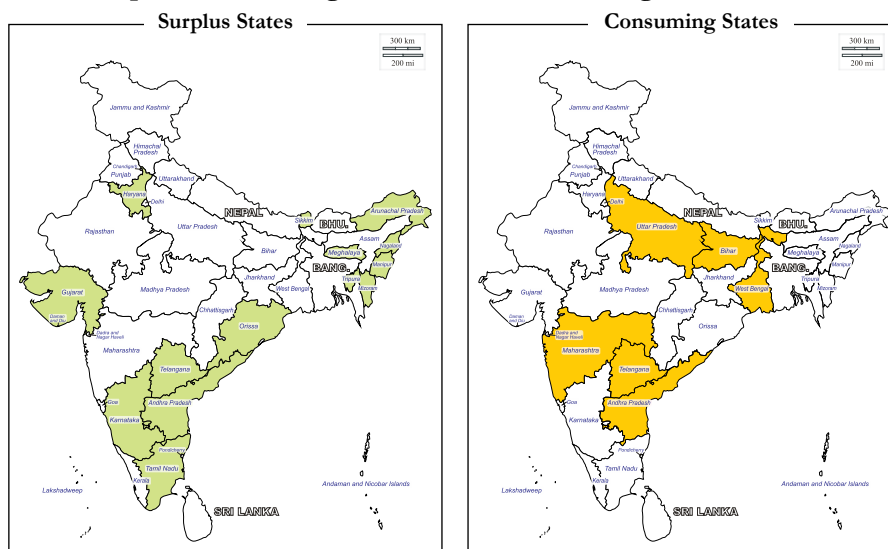
Source: NSSO, NHB, YBL Analysis, d-maps.com

Turmeric

- Uttar Pradesh, Bihar, Maharashtra and West Bengal are the highest consumers of Turmeric.
- The north eastern region is turmeric surplus region, with almost all states (barring Assam) producing surplus.
- Besides the NE states, A.P, Tamil Nadu, Karnataka, Gujarat, Haryana and Odisha produce turmeric surplus states.

The states of Himachal Pradesh, Jammu & Kashmir have the highest per capita consumption of turmeric. (J&K highest per capita rural consumption of 93.4 gms per month and H.P highest urban per capita consumption of 89.57 gms per month).

Exhibit 10: Turmeric Surplus States & Highest Turmeric Consuming States in India



Source: NSSO, NHB, YBL Analysis, d-maps.com

Dry Chili*

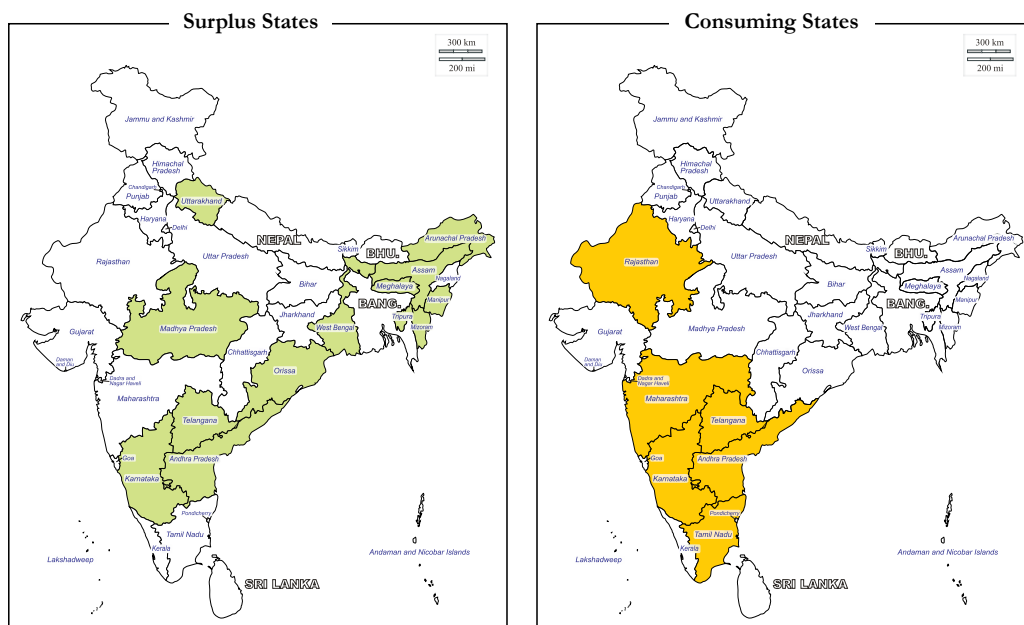
- Maharashtra, Rajasthan, Andhra Pradesh and Karnataka are the highest consumers of dry chilies in India.
- Majority of the north eastern region is chili surplus and has the potential to meet the demand of rest of the states.
- Uttarakhand is also a chili surplus state.
- Besides the NE states, A.P, West Bengal, Odisha, M.P and Karnataka produce chili in surplus quantities. However, the NE region has an added advantage as most of the chilies produced in the region have high SHU.

The states of Kerala (rural-163.8 gms and urban 158.9) and Rajasthan (rural-145.1 and urban 129.6 gms) have the highest per capita consumption of dry chilies.

The India average per capita consumption stands at 71.9 gms per month and 77.6 gms per month for rural and urban respectively.

*The household consumption of chili is of limited relevance in context of chilies produced in Nagaland, Mizoram, and other high SHU chilies, as it is mostly in demand for the snacks industry.

Exhibit 11: Chili Surplus States in India & Highest Chili Consuming States in India



Source: NSSO, NHB, YBL Analysis, d-maps.com

Trade Scenario

India is known as the “Land of Spices”. Out of 109 spices listed by ISO, about 75 are produced in India. On the trade front, India is the largest exporter of spices globally, exporting products worth USD 2.6 Bn (approx. 1 Mn MT) to more than 20 countries in the world.

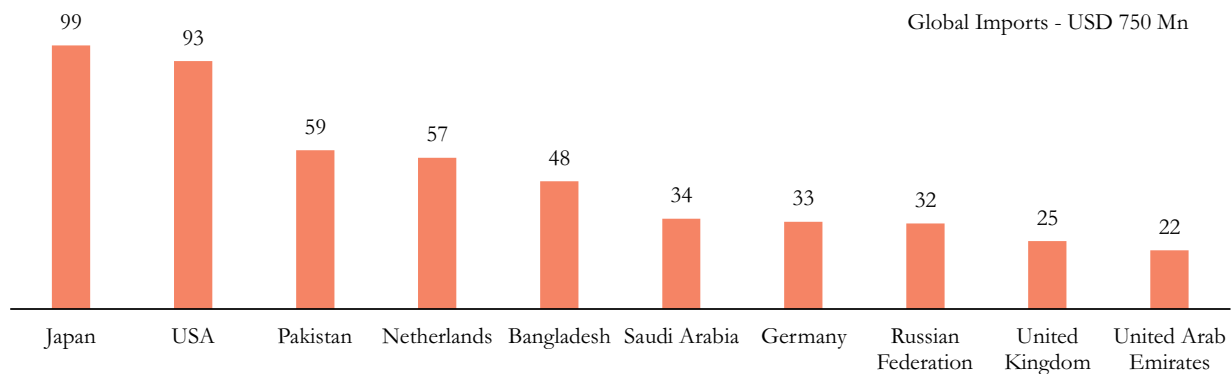
The major share to the export basket in terms of volume is contributed through chili, cumin, and turmeric. In terms of value, the key contribution is made by mint and mint products, spice oils and oleoresins, pepper and chili. The trade scenario for the focus crops under this study is discussed below:

Ginger

- Though India is the largest producer of Ginger globally, its exports are not as large. India exports around 19,000 MT of ginger (in fresh and processed form) worth USD 37 Mn (2016) and ranks 4th globally in the export of fresh ginger, while second in crushed/ground ginger. China exports close to 15 times of India’s ginger exports and is the world’s largest exporter.
- Besides this recorded trade, there is also a substantial amount of informal trade that happens between India- Bangladesh and India- Myanmar. This trade surplus is mainly derived from the north eastern region of the country. Due to the prevalence of this informal trade, the exportable surplus and value for the north east products is difficult to determine.
- While China supplies most of its ginger to the Netherlands, Japan, USA, Pakistan and the UAE, India’s major export destinations include Spain, Morocco, USA, Saudi Arabia and Bangladesh. Netherlands, the second largest exporter of fresh ginger, imports ginger from China and re-exports it to the EU.

**The global trade for
Ginger is worth USD
600 Mn.**

Exhibit 12: Key Ginger Importing Nations Globally (2016)



Source: ITC Trademap

- India faces stiff competition from the leading exporter – China, both in terms of quantity as well as price. Indonesia, China, Thailand, Vietnam & Malaysia offer lucrative prices to importing countries. The pricing depends on the quality, availability, domestic prices and production scenario in other parts of the world.

The tentative value per unit (as per ITC data) is compared in the table below.

Exhibit 13: Value per Unit* for Fresh Ginger Exports

Country	Per Unit Value (USD/MT) 2016
World Average	765
Thailand	615
Brazil	790
China	647
Netherlands	1543
Nepal	280
Australia	6212
India	1695

Source: ITC TradeMap

*The numbers in the table above are indicative values per unit of produce. Actual landing price in the importing country may vary depending on logistics, trade duties etc.

- In terms of quality, India faces stiff competition from Australia, North American countries and Jamaican and Sierra Leone ginger. The Australian ginger is perceived to be of high quality due to its standardized size and clear appearance.
- The Chinese ginger though available at lower prices is not much recognized for its quality due to high usage of bleaching agents and sulphur dioxide during processing.
- Netherlands is the largest importer and trader of ginger in Europe and is an important trade hub for intra-European trade. Its imports have increased significantly in volume by 16% annually between 2012 and 2016. In 2016, 96% of Dutch imports were sourced directly in developing countries.

- Comparing the unit prices (USD/MT) of ginger, Indian ginger is sold at a much higher price as compared to China. Within the Indian export destinations, Bangladesh fetches minimum prices for Indian ginger. Most of the quantum exported to Bangladesh comes from the north eastern region, thus providing very low prices across the value chain including the farmers.

Exhibit 14: Comparison of Per Unit Value of Ginger from India at Key Export Destinations

Country	Per Unit Value (USD/MT) 2016
India Average	1,695
New Zealand	7,750
Belgium	7,250
Sweden	6,933
France	6,385
Germany	5,717
Switzerland	1,000
Bangladesh	395

Source: ITC TradeMap

The prices pertain to the HS CODE 091011 i.e. Ginger- neither crushed nor ground. This category majorly includes fresh ginger and dried bleached/unbleached ginger

Turmeric

- India is the largest producer, consumer as well as exporter of Turmeric globally. However, the global trade for turmeric is not as high as that those of peppers, chilies, garlic or ginger, the primary reason being the limited usage of turmeric in global cuisine (unlike India).
- However, of late the global trends are changing and import of turmeric is on an upswing largely due to increasing awareness on the health benefits of turmeric.

In 2016, India exported about 100 thousand MT of turmeric (70% of the global trade), worth USD 180 Mn.

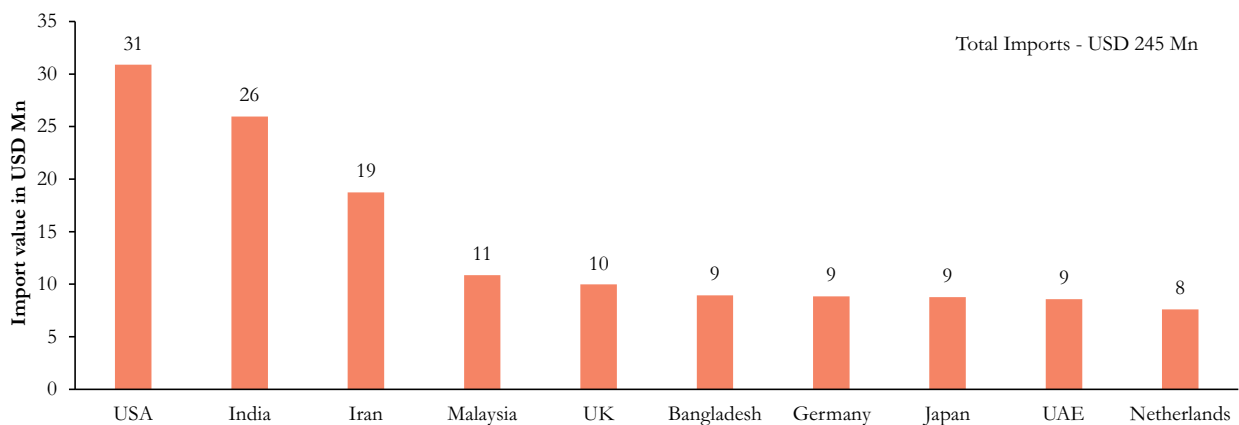
“Golden Milk” or “Turmeric Latte” – a combination of nut milk and juiced turmeric root – is becoming the most sought after drink in many countries. ‘Haldi- Dudh’ (Turmeric milk) as it is popularly called in India has been our homemade remedy for various ailments since ages.

- Unlike other crops, the competition for turmeric is very low. There are very few countries worldwide, that cultivate turmeric and even fewer who can match the quality of Indian turmeric. Thus the challenge is not competition, but the limited awareness on benefits of turmeric.
- In Europe the capsules/tablets containing powder and extracts are marketed to support the immune system, joint and digestive health. Also, the demand for organically produced food supplements continues to grow in the region. However, the total market share for organic Turmeric is still small, according to industry sources.



- Organic certification is most common for Turmeric powder/flakes, because companies can certify the final product. For capsules/tablets containing Turmeric/Curcumin extracts, food supplement manufacturers do not certify the entire product very often. Capsules/tablets usually contain a small amount of Turmeric extracts and a much higher one of fillers. These fillers usually do not have organic certification.
- In 2016, India exported about 100 thousand MT of turmeric (70% of the global trade), worth USD 180 Mn.
- The key importers for Indian Turmeric include USA, Iran, UAE, Malaysia, UK and Saudi Arabia. Globally the key importers include USA, India, Iran, Japan and Malaysia. Due to its high domestic consumption India imports substantial quantities of turmeric from Myanmar, Indonesia, Ethiopia and Vietnam.

Exhibit 15: Key Turmeric Importing Nations Globally (2016)



Source: ITC Trademap

- The other exporters include Indonesia, Myanmar, Netherland and UK. Netherlands is a key importer of Turmeric and re-exports it to other countries in Europe (especially to Germany, Italy and France).
- Comparing the unit prices (USD/MT) of turmeric, Indian turmeric is sold at par with the global average rates.

**Unit Value-
World Average
USD 1783/ MT**

**Unit Value-
India Average
USD 1757/ MT.**

Exhibit 16: Comparison of Per Unit Value of Turmeric at Key Export Destinations

Country	Per Unit Value (USD/MT) 2016
India Average	1,757
United States of America	1,470
Iran	1,416
China	1,604
UAE	1,966
Malaysia	1,416
Bangladesh	1,326

Source: ITC TradeMap

Chili

Known as the wonder spice, chili is the most widely used universal spice. Different varieties of chili are cultivated across the globe for varied uses like vegetables, pickles, spices and condiments. In daily life, chilies are integral and the most important ingredient in many different cuisines around the world as these add pungency, taste, flavour and colour to the dishes.

- India is the world leader in chili production followed by China and Pakistan.
- Indian chili is considered to be world-famous for two important commercial qualities—colour and pungency levels. Some varieties are famous for the red colour because of the pigment. Other quality parameters of chili include length, width and skin-thickness. India is also one of the key sources for hot chilies.
- The global trade of chilies is evenly distributed between whole dried and crushed/ground chilies.
- India exported around 350 thousand MT of chilies worth USD 625 Mn. The key import destinations include USA, UAE, UK, Nepal, Indonesia and South Africa. India exports chilies both in whole as well as ground forms. The country is the largest exporter of dried whole chili and second largest exporter of chili powder.
- The per unit value of Indian chili is at par with the global prices (for whole dried as well as ground chili).

One of the hottest chilies of the world “Bhoot Jholokia” is a native of India and grown in the state of Assam, Nagaland and Manipur.

Exhibit 17: Value per Unit for Whole Dried Chili

Country	Per Unit Value (USD/MT) 2016
World Average	2,242
India	2,113
China	1,967
Peru	2,536
Mexico	3,514
Germany	6,529
Myanmar	2,257

Source: ITC TradeMap

Amongst the key export destinations for Indian chilies, the whole dried chili receive higher prices in countries like Germany, Philippines, New Zealand, Australia, UK; while the lowest price realization is from the neighboring countries of Nepal, Bhutan and Bangladesh. The Chili from the North Eastern states either gets consumed in the local market or is exported to Bangladesh, receiving a minimum price realization for the produce.

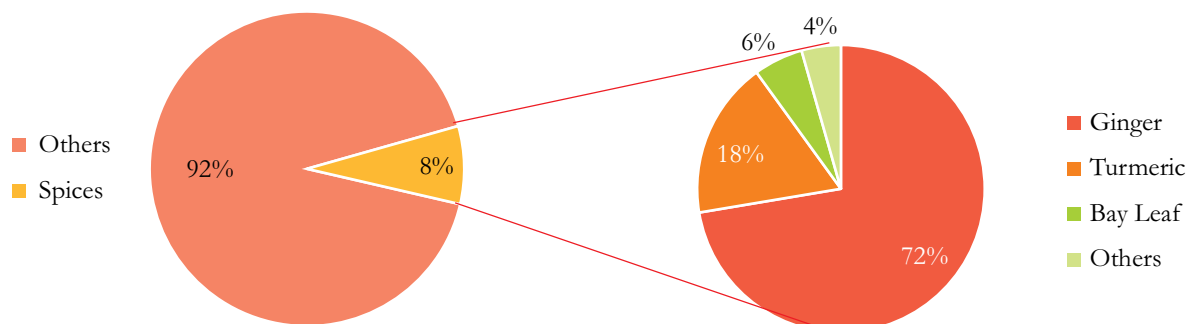


4 State-wise Value Chain Analysis of Shortlisted Commodities

4.1 Meghalaya

Bounded on the North and East by Assam and on the South and West by Bangladesh, Meghalaya is spread over an area of 22, 429 square kilometers. Two distinct agro climatic zones exist in the state which makes it conducive to produce a wide range of horticultural crops. Spices contribute about 8% to the horticulture basket with the key contributors being Ginger Turmeric and Bay Leaf/Cinnamon.

Exhibit 18: Share of Spices in Horticulture Production Basket of Meghalaya (2016-17)



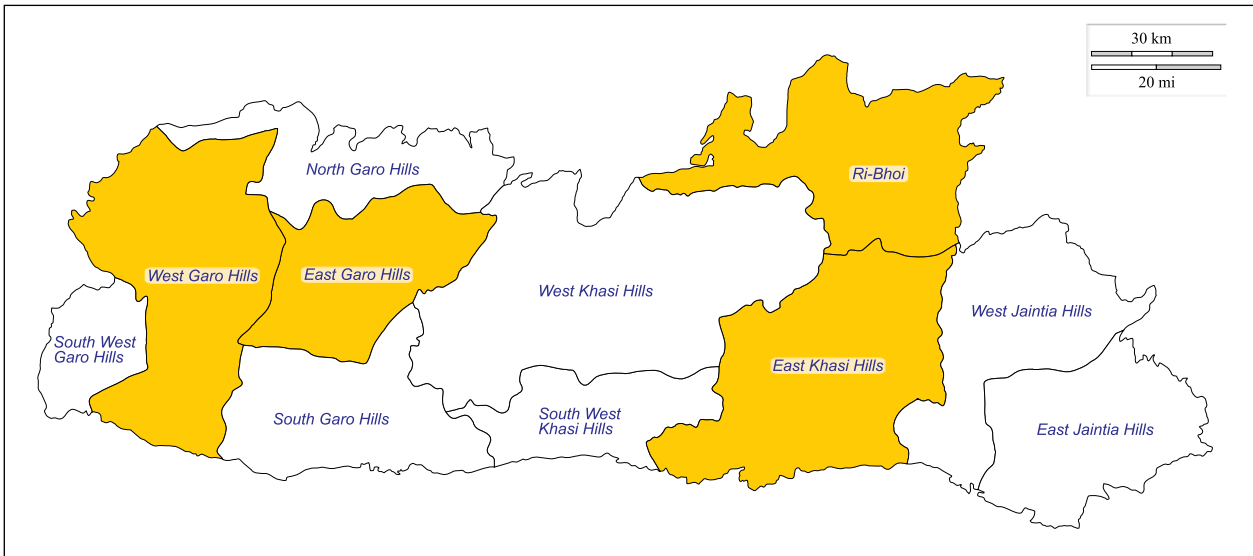
Source: Ministry of Agriculture and Farmers' Welfare, 2016-17

Ginger

- Meghalaya produces around 65,000 MT of ginger annually, which accounts for about 6% of the country's production. The crop contributes around 72% to the total spices production of the state. Nearly 90-95% of the produced ginger is surplus and is marketed further, majorly to traders of Assam and Kolkata.
- The key clusters producing ginger include Ri Bhoi, East Khasi, East Garo and West Garo districts of the state.

The state ranks 6th in terms of ginger production.

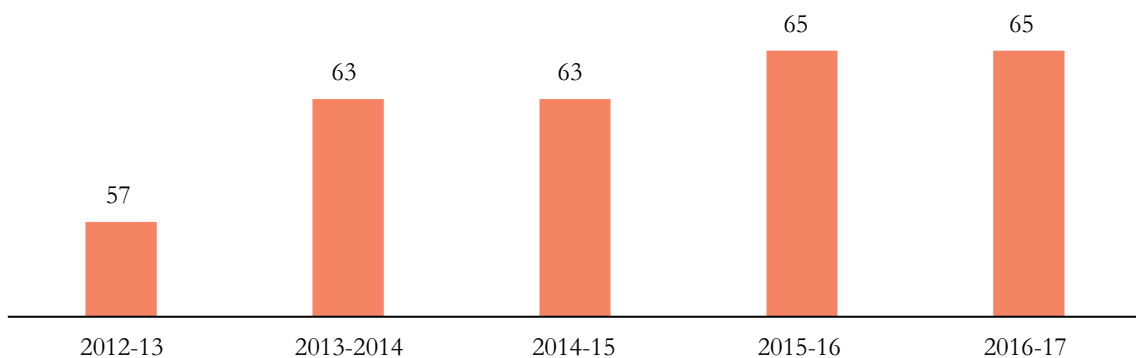
Exhibit 19: Major Ginger Producing Areas of Meghalaya



Source: d-maps.com

The area and production of Ginger has remained almost constant over the last 5 years.¹

Exhibit 20: Trend for Ginger Production in Meghalaya ('000 MT)



Source: Ministry of Agriculture and Farmers Welfare

- The key varieties grown in these clusters include the Nadia (better yield & less fiber) and Varada (higher pungency).

¹As per the state government officials, these varieties yield a crop of around 15-20 MT/Ha (as per primary discussions with government officials), much higher than those recorded by Ministry of Agriculture and National Horticulture Board (6.7 MT/ba). The field data also points to a higher yield as compared to those stated by the central government agencies, however not to a level of 20 MT/Ha.

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
		Sowing									
		Harvesting									

The following are the common practices followed in Meghalaya for ginger production



Cost of Production

- The farmer uses a mix of mother rhizomes stored from previous harvest as well as procured from other farmers and market resources.
- Cow dung is used as fertilizer depending on the supply available in the market, which is usually in limited quantities.
- Chemical fertilizers are not used by the farmers in majority of the state.
- In terms of labour, resources are primarily hired from the market for ploughing, sowing and harvesting processes. Male labourers command a rate of INR 300 per day while there is a stark difference in wages for female labourers who get only INR 200/day. The primary reason for this wage difference is
 - o Work Timings- Since women in the NER are involved in managing the household as well as other outdoor activities, their work timing become comparatively shorter. Men manage only the outdoor activity and hence can start work earlier as compared to women.
 - o Physical Strength- Since majority of the labor is deployed in activities requiring more physical strength (like carrying headload of produce from farm to main road/ storage center, harvesting operations, etc.), men are paid higher than the women.
- The incidence of child labor in case of agriculture is minimal in the state.
- Average seed rate is 1.75 MT/Ha of mother rhizome with almost no usage of irrigation or chemical inputs.

The farmers usually spread the straw, grasses and other plant residues on the ginger beds immediately after planting. This acts as mulch which protects the seedlings from rain, prevents weed growth, keeps the soil moist and soft and accelerates plant growth. The crop is monsoon-dependent. Weeding is mainly done manually by the farmers. The losses in field amount to about 1-2% of the production.

A snapshot of the breakup of cost of production for ginger in Meghalaya is provided below:

Exhibit 21: Cost of Production for Fresh Ginger in Meghalaya (per kg)

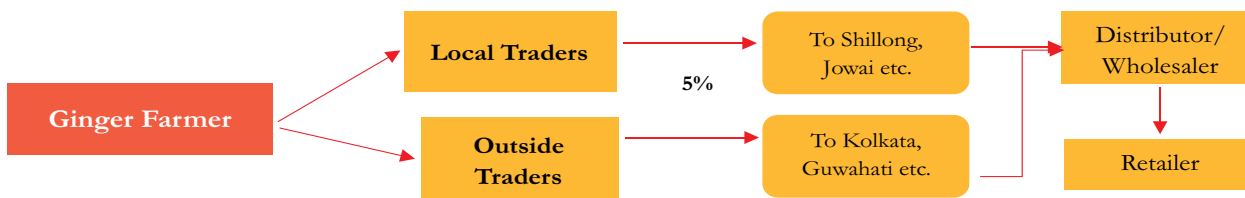
Sr. No.	Particulars	Amount (in INR/Kg of produce)
1	Planting Material - Mother Rhizome (1.75 MT/ha)	5.8
2	Manure/FYM (10 MT cow dung/ha.)	1
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	<ul style="list-style-type: none"> Labour (300 man-days/ha.) Includes Sowing, ploughing, harvesting Male: Female labourers engaged – 60:40 Male: INR 300/day & female: INR 200/day 	4.8
6	Cost of Production for fresh ginger (per kg)	11.6

Source: Primary Survey, YBL Analysis

Marketing Channel

- Currently most of the ginger is sold through traders from Assam and a small portion through local traders. The traders further sell the ginger in the markets of Kolkata, Guwahati and Jorhat. A part of this is consumed in the state of Assam and nearby and part of it goes to Bangladesh.

Exhibit 22: Marketing Channel for Ginger in Meghalaya



Source: Primary Survey, YBL Analysis

- The price mark ups for Ginger in Meghalaya are as depicted in the table below:

Exhibit 23: Price mark ups for Ginger in Meghalaya

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production	11	11
Average Selling price by Farmers	30*	30
Loading/unloading charges	0.50	30.50
Packaging Cost (Gunny Bags @ INR 20 per 50 kg bag)	0.25	30.75
Aggregator Margin (@10-15%)	3	33.75
Transport to Main Market (@ 40-50 per 50 kg)	~1	34.75
Wholesaler's margin (20-30%)	~8.5	43.25

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Wastage (@ 0.5%)	0.20	43.45
Retailer's Margin (30-35%)	~13	56.45
Wastage (@ 1%)	0.5	57
Final price		~60

Source: Primary Survey, YBL Analysis

*The average farm gate price received by the farmers for Ginger is around INR 30/kg, which fetches them an average profit margin of around 30-40%.

- o **Start of Season:** INR 15-16
- o **Mid-Season:** INR 30-40
- o **End Season:** INR 50-60

However, the price volatility for ginger in the region is fairly high and the fluctuations each year can be totally out of range. When the prices of ginger crash severely, farmers prefer to keep the ginger un-harvested in their fields, and then harvest it when the prices are better.

The price realization for Ginger in Meghalaya is much better than those of other north eastern states due to the following reasons:

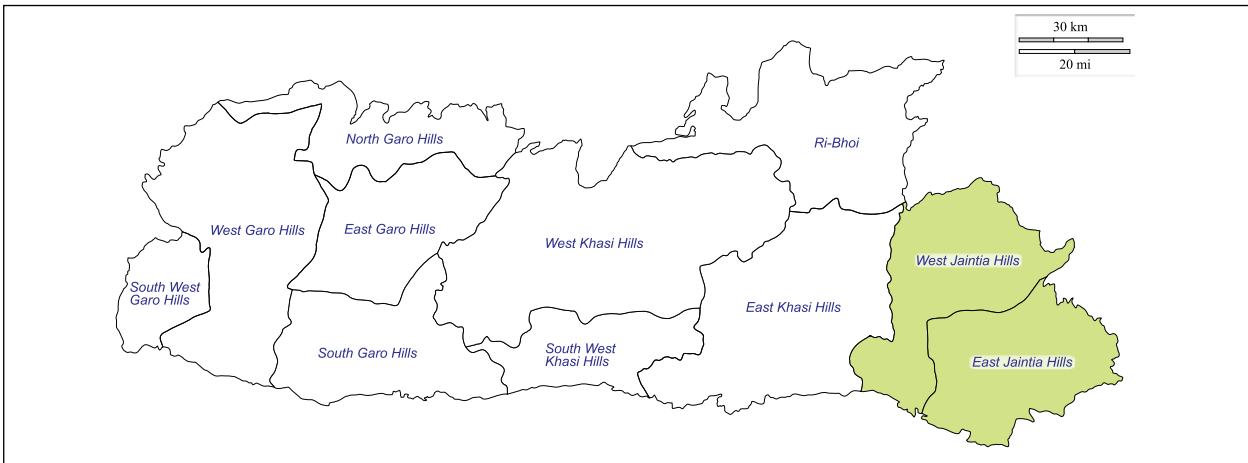
- o Proximity to Assam, as compared to other states. Major ginger producing cluster being Ri Bhoi district which falls on Shillong-Guwahati Road.
- o The ginger itself is considerably larger, cleaner and with a lighter skin tone, which is preferred in Assam as well as Bangladesh.

The farmers clean and grade (manually) the produce in the field and small, medium and large sized ginger rhizomes are sold separately to the traders. This practice is usually not followed in the states of Mizoram and Nagaland. This is one of the reasons why traders prefer the produce of Meghalaya, over that of Mizoram and Nagaland. The average price received by the farmers is also higher in Meghalaya, as compared to Mizoram and Nagaland, however the only reason is not the cleaned ginger. Meghalaya's proximity to Assam, Ginger quality (which is bigger and lighter colored) also influence the price realization.

Turmeric

- Meghalaya produces around 16,000 MT of turmeric annually, which accounts for about 2% of the country's production.
- The crop contributes around 18% to the total spices production of the state and is the second most prominent spice after ginger.
- Nearly 70-80% of the produced turmeric is surplus and is marketed further, majorly to traders of Assam and Kolkata.
- The key clusters producing ginger include Khliehriat in East Jaintia Hills, Laskei, Shangpung and Thalaskain in West Jaintia Hills.
- The turmeric farmers of Meghalaya are mostly marginal with landholding of less than 1 ha.

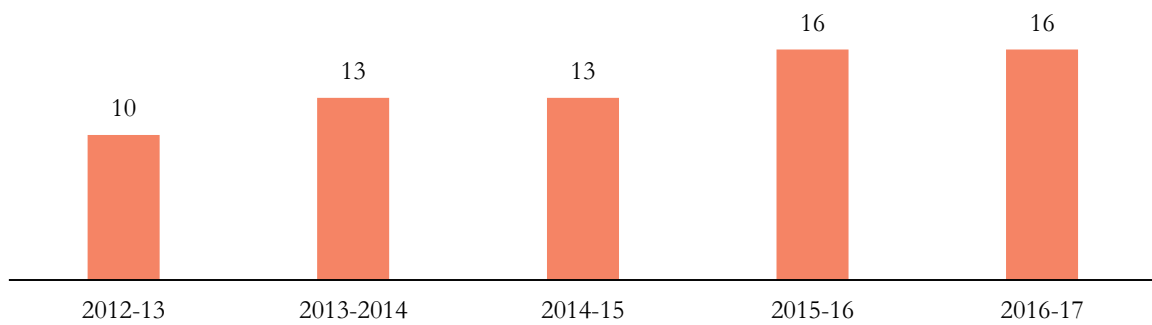
Exhibit 24: Major Turmeric Producing Areas of Meghalaya



Source: d-maps.com

The production of Turmeric has increased by around 10% over the last 5 years.

Exhibit 25: Trend for Turmeric Production in Meghalaya (*000 MT)



Source: Ministry of Agriculture and Farmers Welfare

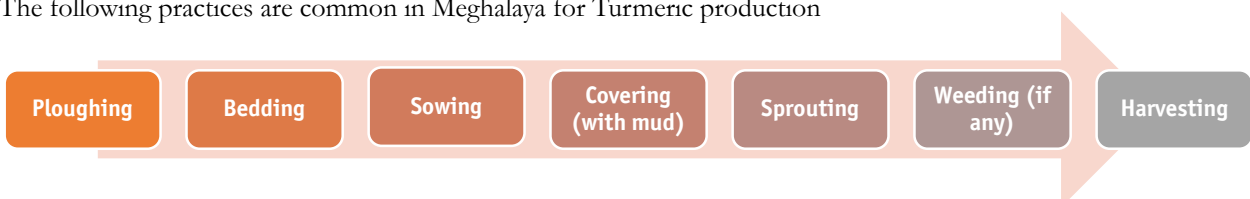
- The main varieties grown here include Lakadong (90%), Lachein and Megha Turmeric-1 (10%). Lakadong Turmeric is much sought after by the extraction industry because of its high curcumin content (<5.5). The variety is majorly grown in Jaintia Hills is said to be one of best.
- As per the state government officials, these varieties yield a crop of around 4-5 MT/ha, without any input usage & about 8-10 MT/Ha on application of manure/FYM/cow dung.

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

The following practices are common in Meghalaya for Turmeric production



Cost of Production

The farmer uses a mix of mother rhizomes stored from previous harvest as well as procured from other farmers and market resources. Cow dung is used injudiciously depending on the supply available in the market. In terms of labour, resources are primarily hired from the market for ploughing, sowing and harvesting processes. Male labourers command a rate of INR 300 per day while female labourers get wages at around INR 200/day. Average seed rate is 1.8 MT/Ha of mother rhizome with almost no usage of irrigation or chemical inputs. A snapshot of the breakup of cost of production for turmeric in Meghalaya is provided below:

Exhibit 26: Cost of Production for Fresh Turmeric in Meghalaya (per kg)

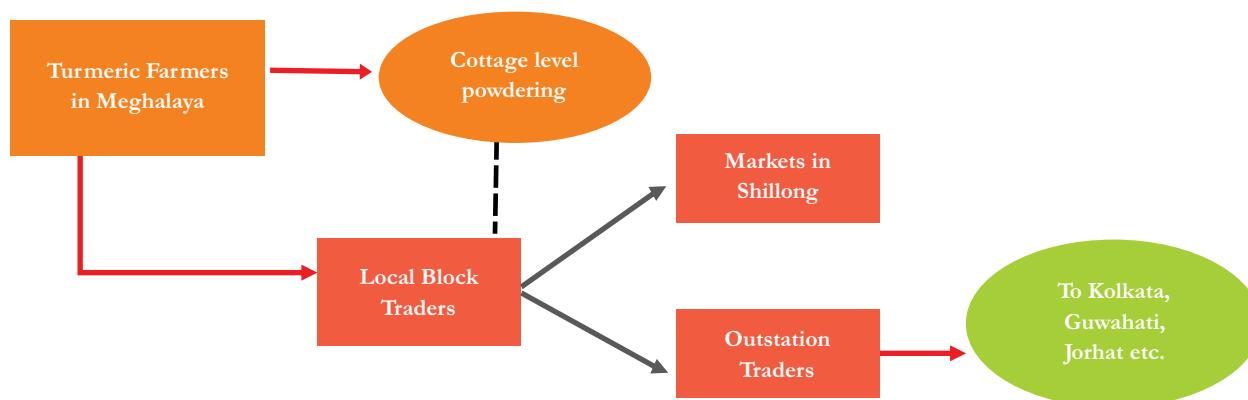
Sr. No.	Particulars	Amount (in INR/kg of produce)
1	Planting Material - Mother Rhizome (1.8 MT/ha)	7.6
2	Manure/FYM (10 MT cow dung/ha)	1.8
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	Labour (225 man-days/ha.) • Includes Sowing, ploughing, harvesting • Male: Female labourers engaged – 50:50 • Male: INR 300/day & female: INR 200/day	7.7
6	Cost of Production for fresh turmeric (per kg)	17.1

Source: Primary Survey, YBL Analysis

Marketing Channel

- There are 2 major marketing channels for turmeric in Meghalaya- the first and more prominent is farmers selling their turmeric to local cottage industries converting raw turmeric into powder and selling it in the key markets of Meghalaya or nearby states.

Exhibit 27: Marketing Channel for Turmeric in Meghalaya



Source: Primary Survey, YBL Analysis

- The price mark ups for Turmeric in Meghalaya are as depicted in the table below:

Exhibit 28: Price Mark-ups for Turmeric in Meghalaya

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production	17	17
Average Selling price by Farmers	25	25
Loading/unloading charges	.50	25.50
Packaging Cost (Gunny Bags @ INR 20 per 50 kg bag)	0.25	25.75
Aggregator Margin (@10-15%)	2.75	28.50
Transport to Main Market (@ 40-50 per 50 kg	~1	29.50
Wholesaler's margin (30%)	~8	37.50
Wastage (@ 0.5%)	1.5	39
Retailer's Margin (40%)	~16	45
Wastage (@ 1%)	4.5	50
Final price		~50

Source: Primary Survey, YBL Analysis

4.2 The Organic Movement in Meghalaya

- Organic farming methods are being promoted extensively by the Government of Meghalaya.
- The Chief Minister of the State launched the initiative called 'Mission Organic' in January 2015. The entire idea of making North East the hub of organic farming is leveraging the "by default" cultivation practices and the high intrinsic value of the produce.
- Moreover, there has been provisioning of funds for NER for organic value chain development.

The government has set a target to convert at least 1 lakh Ha into organic farming by 2020.

Contract farming being practiced by Shiv Biotech – Delhi and ICCOA in around 1,000 Ha across the state. Out of this 80 Ha is currently earmarked for Turmeric.

- Unlike Sikkim, the state is not looking at converting the entire state into organic, but to take a phase wise approach to converting some districts/ clusters into organic.
- In the first phase Mission Organic has been launched in South West Garo Hills. The Government has also stopped subsidizing farmers for chemical fertilizers and pesticides, and continued it for bio-inputs.
- The government has set a target to convert at least 1 Lakh Ha into organic farming by 2020. To begin with, the government had targeted 20,000 Ha of conversion, which has now been raised to 40,000 ha.
- Discussions with Government officials and secondary research suggest that the focus is more on fruits and vegetables. The key reason to this

could probably be the higher production levels and more wastages in fruits and vegetables leading to very low price realization for the farmers. Thus, the Government aims at making the fruit & vegetable farming more remunerative for the farmers by 'Going Organic'. Moreover, the government is very positive on the supply of off-season vegetables (which the state supplies currently as well from May- Nov to NER and

Siliguri in West Bengal). However, in the current scenario there are almost negligible cases where organic vegetables and fruits in fresh form have received a premium for organic.

- However, the organic cultivation and certification process for ginger and turmeric have been initiated in the state.

Processing Infrastructure in Meghalaya

Efforts have been made by the state government as well as the private sector to set up processing infrastructure in the state. However, not all the units have been able to operate successfully in the region. An indicative list of spice processing units is provided below.

Exhibit 29: Existing Ginger and Turmeric Processing Infrastructure in Meghalaya

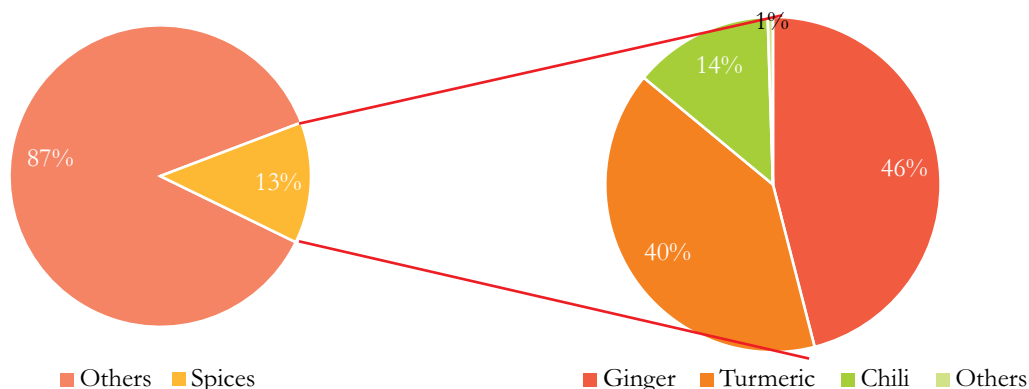
Crop	Unit	Products	Comments
Ginger	NERAMAC facility at Byrnihat	Ginger products- flakes, powder	Non-functional due to lack of volumes
Ginger	K.D. Agro Industries, W. Garo Hills	Dehydrated Ginger	-
Turmeric	Two small scale powdering units in East Jaintia hills district and 12 small scale powdering units in West Jaintia hills district	Turmeric Powder	Fully operational
Turmeric	IFAD funded oleoresin extraction unit near Thalaskin	Oleoresin extraction	Not operational. A very good state of the art unit. Would prefer to have some PPP intervention for it to run again.

Source: Primary Stakeholder discussions

4.3 Mizoram

The state of Mizoram is popularly known as the songbird of India and is one of the smallest states in the country. The name Mizoram signifies the land of the Lushai highlanders. It is located in the southern corner of Northeast India nestled mainly between Myanmar and Bangladesh, and also shares a part of its boundaries with its neighboring states of Assam, Manipur and Tripura. Mizoram is a diverse land with mountains and valleys as well tribal villages and urban centers with modern culture and lifestyle unlike elsewhere in India. Agro-climatic conditions in Mizoram are suitable for growing a wide range of horticultural crops. Mizoram accounts for about 13.2% of the total fruits produced in the Northeast. Spices contribute about 13% to the horticulture basket with the key contributors being Ginger, Turmeric and Chili.

Exhibit 30: Share of Spices in Horticulture Production Basket of Mizoram (2016-17)

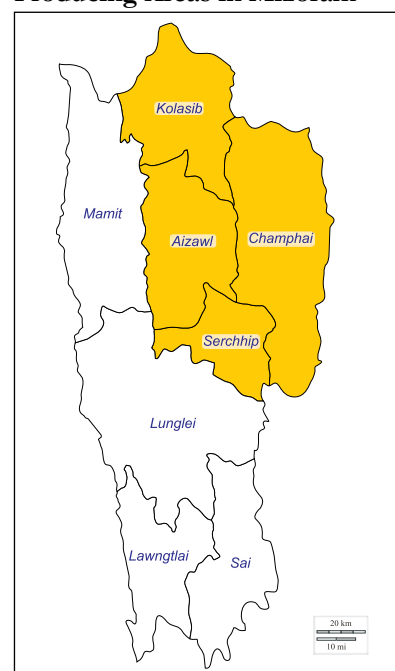


Source: Ministry of Agriculture and Farmers Welfare, 2016-17

Ginger

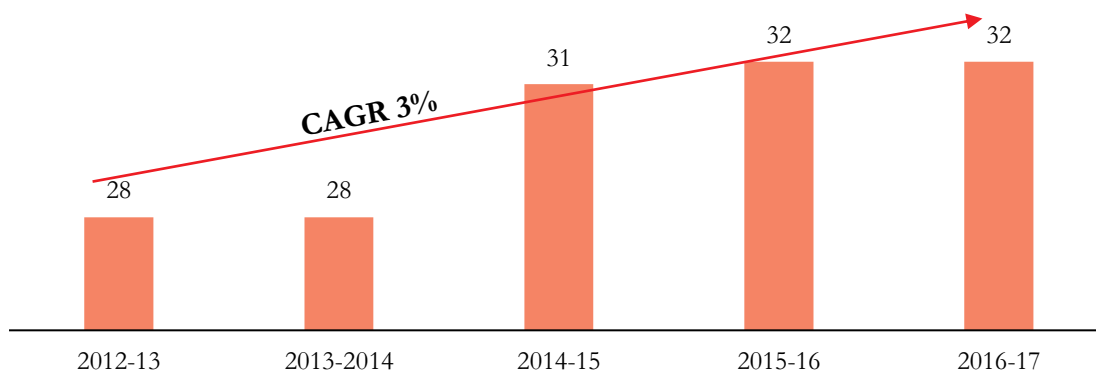
- Mizoram produces around 32,000 MT of Ginger annually, which accounts for about 3% of the country's production. The crop contributes around 46% to the total spices production of the state. Nearly 90% of the produced ginger is surplus and is marketed further, majorly to traders of Assam.
- The key clusters producing ginger include Aizawl, Kolasib, Champhai and Serchhip districts of the state.
- Ginger is one of the important cash crops grown in Jhum lands in Mizoram. The agro climatic conditions of Mizoram suit the ginger cultivation whose commercialization may be traced back to 1970's.
- The area and production of Ginger has not increased very significantly in the last 5 years due to limited land availability and stagnant yields of the crop.

Exhibit 31: Major Ginger Producing Areas in Mizoram



Source: d-maps.com

Exhibit 32: Trend for Ginger Production in Mizoram (000 MT)



Source: Ministry of Agriculture and Farmers Welfare, 2016-17

- There are three major varieties of ginger namely Thigpui, Thinglaidum and Thingria of which Thingria variety is most popular.²
- The sale of Ginger starts from the month of November & December. The peak season is from January to May as the price offered to the farmers spike up during these months.

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Cost of Production

The farmer uses a mix of mother rhizomes stored from previous harvest as well as procured from other farmers and market resources. Average seed rate is 2 MT/Ha of mother rhizome. Neither bio-compost/cow dung nor chemical fertilizers are used by the farmers. In terms of labour, resources are primarily hired from the market for land cleaning, sowing and harvesting processes. The entire area is rain-fed. Average yield per hectare is around 15 MT (as per field survey). A snapshot of the breakup of cost of production for ginger in Mizoram is provided below:

Exhibit 33: Cost of Production for Fresh Ginger in Mizoram (per kg)

Sr. No.	Particulars	Amount (in INR/kg of produce)
1	Land preparation	1
2	Planting Material and sowing	3.3
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	Labour-Intercultural Operations	2.1
6	Labour –harvesting and transportation	3.5
7	Cost of Production for fresh ginger (per kg)	~10

Source: Primary Survey, YBL Analysis

Marketing Channel

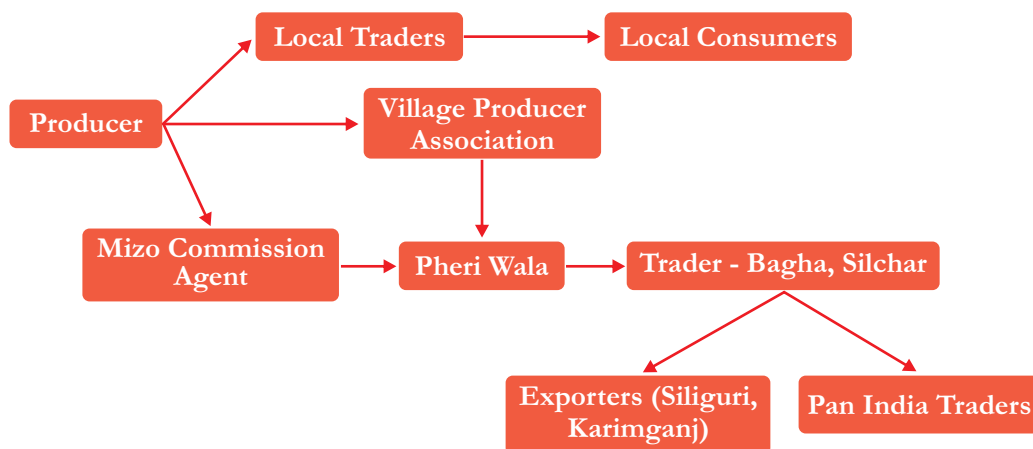
Majority of ginger produced in Mizoram is marketed to Assam. The traders in Assam send their agents who are also referred as Pheriwalas. Pheriwalas procure the produce from Mizo commission agents who act as aggregators (collect produce from the farmers) for a few villages/clusters.

There are two major marketing channels for Ginger:

- Farmers selling it to the local traders who in turn sell it to the consumers within the state.
- Farmers selling it to the village producer organizations or Mizo commission agents who ultimately sell it to pheriwalas (intermediaries sent by the traders in Assam). Ginger from Assam goes to Siliguri which is considered to be the hub in Eastern India. Washing of ginger takes place in Siliguri. From Siliguri, the ginger is sold across states such as Delhi, West Bengal, Bihar, Andhra Pradesh and other states. It is also exported to Bangladesh.

²As per the state government officials, these varieties yield a crop of around 20 MT/Ha, much higher than those recorded by Ministry of Agriculture and National Horticulture Board (~4 MT/Ha). While 20 MT/Ha yield is gained under most optimum conditions in the state, the yield for majority of the farmers varies from 14-16 MT/Ha.

Exhibit 34: Marketing Channel for Ginger in Mizoram



Source: Primary stakeholder consultations, YBL Analysis

- The price mark ups for Ginger in Mizoram are as depicted in the table below:

Exhibit 35: Price Mark-ups for Ginger in Mizoram

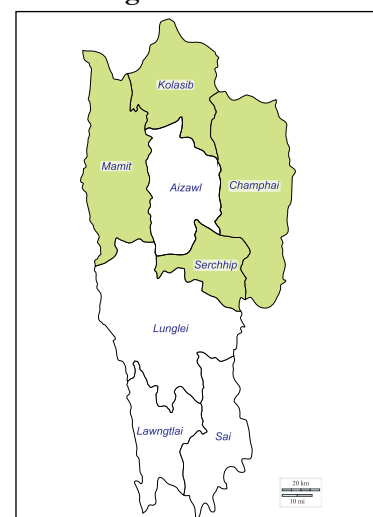
Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production	10	10
Average Selling price by Farmers	13	13
Mizo Commission Agent	1	14
Pheriwala Commission	1	15
Transportation and packaging cost to Baga - Assam	1.5	16.5
Commission Agent @ Baga Assam	1.5	18
Wastage	1	19
Selling price to Siliguri		~20

Source: Primary Survey, YBL Analysis

4.4 Turmeric

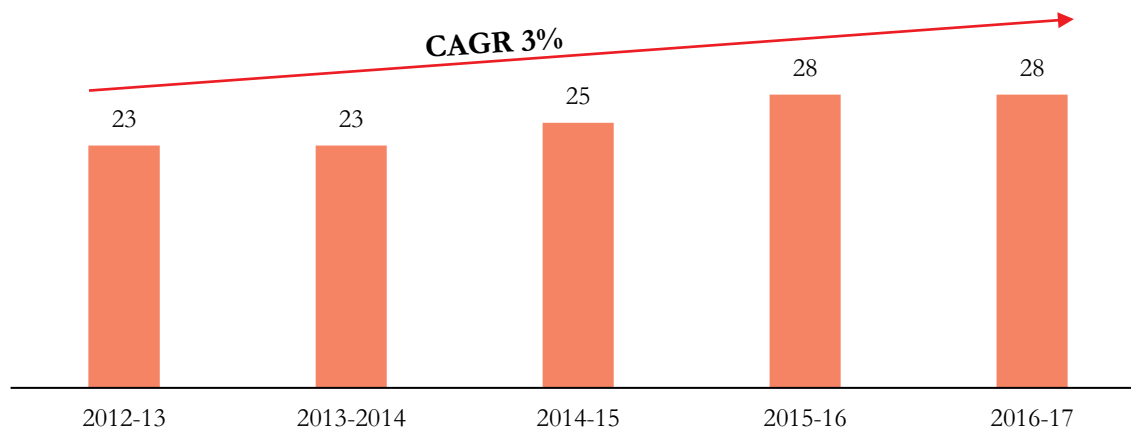
- Mizoram produces around 27,000 MT of turmeric annually, which accounts for about 3% of the country’s production. The crop contributes around 40% to the total spices production of the state and is the second most prominent spice after ginger.
- Nearly 70-80% of the produced turmeric is surplus and is marketed further, majorly within the state and in limited quantities to traders of Assam.
- The key clusters producing ginger include Mamit, Serchhip, Kolasib and Champhai.
- The production of Turmeric has not increased significantly in Mizoram in the last 5 years.

Exhibit 36: Major Turmeric Producing Areas in Mizoram



Source: d-maps.com

Exhibit 37: Trend for Turmeric production in Mizoram (000 MT)



Source: Ministry of Agriculture and Farmers Welfare, 2016-17

- The turmeric produced in Mizoram has great demand in the state as well as neighboring states, however, it has failed to tap the economic potential due to low productivity and confined cultivation.
- The varieties used for cultivation in Mizoram are Lakadong and Megha 1. Though Megha-1 has a higher productivity but Curcumin content is lower (3-3.25%). The Curcumin content in Lakadong variety which accounts for 90% of turmeric grown in the state is around 4.5-5.5%.

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Cost of Production

The farmers usually use mother rhizomes stored from previous harvest. In case of Turmeric, the Curcumin content is a key determinant of high quality produce. The turmeric from the North Eastern States and specifically Mizoram was once very high in curcumin content (~4.5-5.5%), while it has subsequently come down to close to ~3% in many parts of the state. This is primarily because the farmers have started planting fingers instead of the mother rhizome, which has led to a gradual decline in the curcumin content.

The farmers do not use bio-compost/cow dung nor chemical fertilizers in the fields. In terms of labour (for sowing, weeding, harvesting), resources are primarily hired from the market along with usage of family labor. The practice of child labor is not prevalent in Mizoram. The wage rate for men is currently at INR 350/day, while for women it is INR 300/day. The primary reason for this wage difference is due to

- Work Timings- Since women in the NER are involved in managing household as well as other outdoor activities, their work timing become comparatively shorter. Men manage only the outdoor activity and hence can start work earlier as compared to women.
- Physical Strength- Since majority of the labor is deployed in activities requiring more physical strength (like carrying head-load of produce from farm to main road/ storage centre, harvesting operations, etc.), men are paid higher than the women.

- The price differential has been prevalent since ages, and the same trend continues to determine the wage rate even today.

Further there is some division of labor, wherein men take up the task of loading, unloading, carrying head load, while women usually take up the task of cleaning, harvesting, intercultural operations etc.

Average seed rate is 2 MT/Ha of mother rhizome. The entire area is rain-fed. Average yield per hectare is around 17.5 MT/ha.

Transportation cost forms a very significant part of the overall cost of production. This is because the fields are located on the hilly slopes and laborers are required to carry the harvested produce to the main road or the residential area.

A snapshot of the breakup of cost of production for turmeric in Mizoram is provided below:

Exhibit 38: Cost of Production for Turmeric in Mizoram (per kg)

Sr. No.	Particulars	Amount (in INR/kg of produce)
1	Land preparation	0.75
2	Planting Material and sowing	2.25
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	Labour-Intercultural Operations	1.25
6	Labour – harvesting and transportation	5.75
7	Cost of Production for fresh turmeric (per kg)	~10

Source: Primary Survey, YBL Analysis

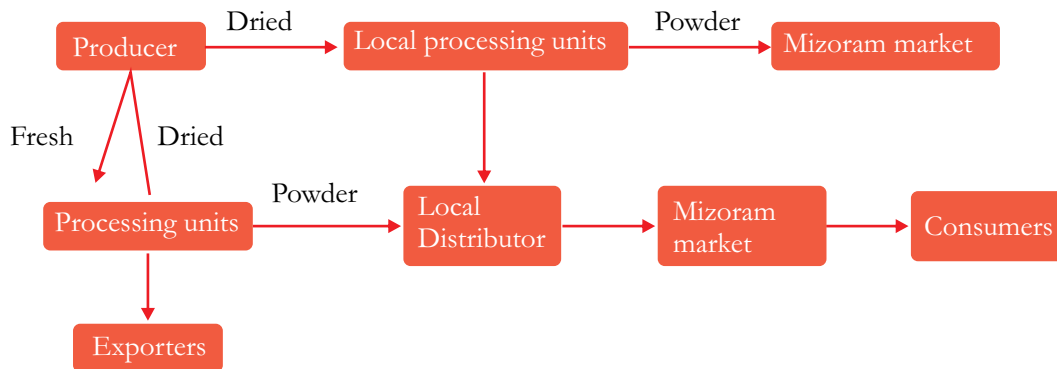
Besides the cost of production, the farmers also bear the cost of drying the turmeric (sun drying) and further selling it to processors. The total cost of production after drying comes to around INR 67/kg of dried turmeric (1 kg dried turmeric is converted through drying of 6 kg fresh turmeric).

Marketing Channel

Turmeric is marketed both in the fresh and dried form and there are two major trade channels for the produce:

- Farmers selling fresh form of Turmeric to CDAR – an NGO working in Mizoram. The unit dries the fresh produce and sells it to exporters outside the state.
- Farmers selling dried form of turmeric to Reiek cooperative society and other local processing units who ultimately process and sell the powder form to local distributors within the state.

Exhibit 39: Marketing channel for Turmeric in Mizoram



Source: Primary interaction with farmers, traders and government officials

Since majority of the turmeric farmers sell dried turmeric, the cost markups for the same are considered. The price mark ups for dried Turmeric in Mizoram are as depicted in the table below:

Exhibit 40: Price Mark-ups for Dried Turmeric in Mizoram (powdered)

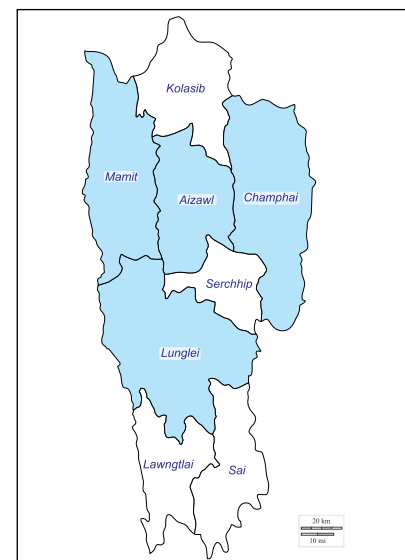
Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production	67	67
Average Selling price by Farmers	85	85
Cost of procurement, processing transportation and margin of processors	80	80
Distributor margin @10%	16	181
Retailer margin @15%	27	208
Final Price		208

Source: Primary Survey, YBL Analysis

Mizo Chili

- North Eastern states contribute only 3% to the country’s chili production. However, the varieties of chili grown in the region are very unique with very high SHU (Scoville Heat Unit). Within the NER, Assam is the largest producer of chili, followed by Mizoram and Arunachal Pradesh.
- The Mizo chili also has a registered Geographical Indication (GI) like the famous Darjeeling tea.
- Mizoram produces around 9000 MT of chili annually, most of which is Mizo chili or its close hybrid.
- The crop contributes around 14% to the total spices production of the state. Nearly 90% of the produced chili is surplus and is marketed further, within the state or to traders of Assam.
- The key clusters producing chili include Aizawl, Mamit, Champhai and Lunglei districts of the state.
- Chilies are taken as a mixed crop mostly with Rice as the field level losses (infestation, damage by birds) are very high.

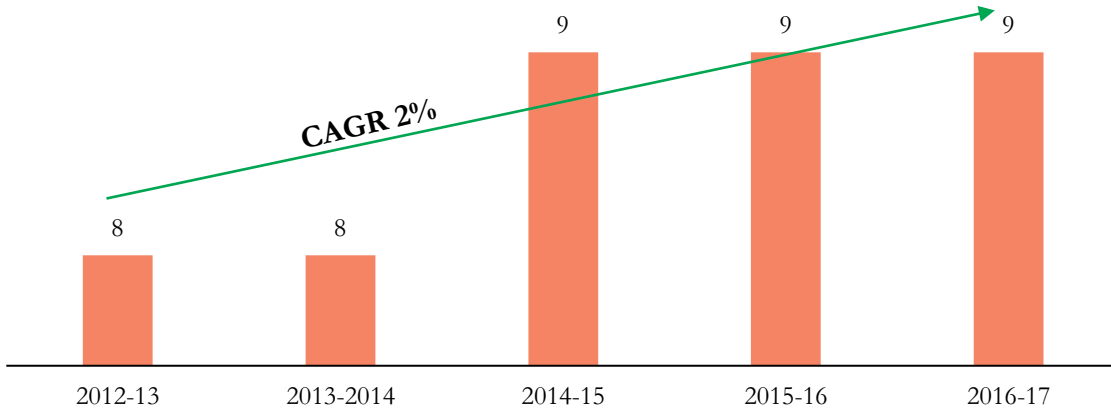
Exhibit 41: Major Chili Producing Areas in Mizoram



Source: d-maps.com

- The area and production of Mizo chili has not increased very significantly in the last 5 years.

Exhibit 42: Trend for Mizo Chili Production in Mizoram (000 MT)



Source: Ministry of Agriculture and Farmers Welfare, 2016-17

- The local variety of chili grown in Mizoram called the “Mizo Chili” is a very small sized fruit with high SHU (more than 200,000 SHU), just like its sister chili Bhut Jolokia. The farmers do not use fertilizers or pesticides in chili cultivation.
- Basic post-harvest management which includes cleaning drying and blanching is done at farm level itself as traders demand for blanched chilies.
- Mizo Chili is sown in the month of April and May. The harvesting starts from November and continues till January (or mid Feb).

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Average yield per hectare for chili in Mizoram came to 10 MT/Ha. Chilies are taken as a mixed crop mostly with Rice as the field level losses (infestation, damage by birds) are very high. The cost of harvesting of chili is very high because the plucking needs to be done twice in a season and the third time the entire crop is unearthed.

A snapshot of the breakup of cost of production for chili in Mizoram is provided below:

Exhibit 43: Cost of Production for Chili (fresh) in Mizoram (per kg)

Sr. No.	Particulars	Amount (in INR/kg of produce)
1	Land preparation	1.25
2	Planting Material and sowing	0.25
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	Labour-Intercultural Operations	3.5
6	Labour – harvesting and transportation	6
7	Cost of Production for fresh chili (per kg)	~11

Source: Primary Survey, YBL Analysis

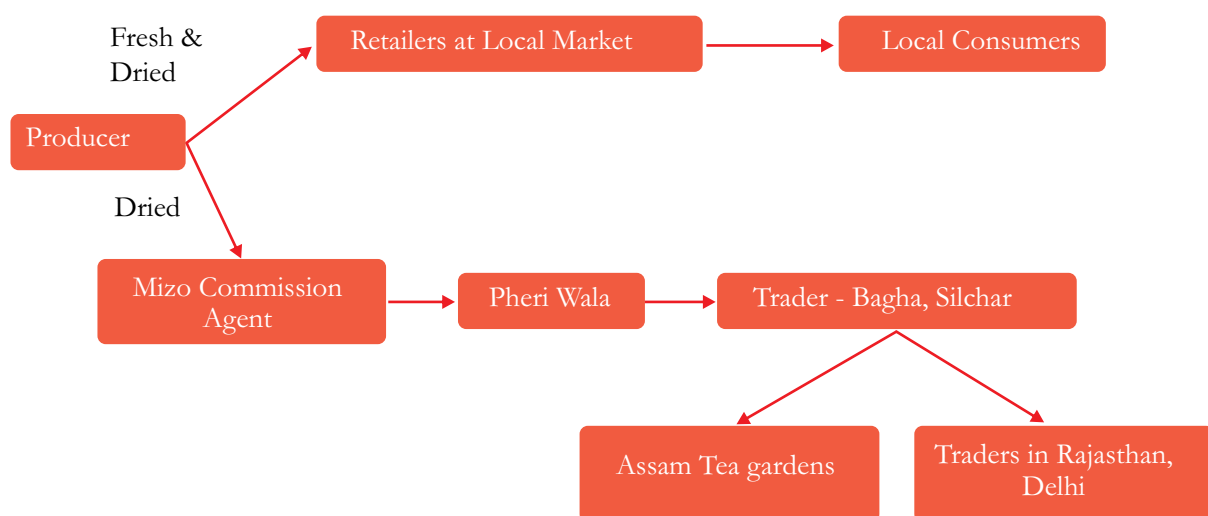
An additional cost of INR 1-2/Kg is incurred in blanching and drying of chilies.

Marketing Channel

The sale of Mizo chili starts from the month of November. The peak season is from December to January when the sale of ginger starts to pick catch up. There is a huge demand of dried chilies from Mizoram but the production fails to catch up the demand. The Mizo chilies are marketed along with ginger. Majority of Mizo chilies (dried) produced in Mizoram is marketed to Assam (same as that of Ginger). The traders in Assam send their agents who are also referred as Pheriwalas. Pheriwalas procure the produce from Mizo commission agents who act as aggregators (collect produce from the farmers). The marketing of Mizo chilies which is same as ginger can be categorized in two ways:

- Farmers selling it to the local traders who in turn sell to the consumers within the state.
- Farmers selling it to the village producer organizations or Mizo commission agents who ultimately sell it to pheriwalas (intermediaries sent by the traders in Assam).

Exhibit 44: Marketing Channel of Chili in Mizoram



Source: Primary Stakeholder discussions, YBL Analysis

- Mizo Chilies (Dried) from Assam goes to traders in Rajasthan and is majorly sold in the snacks industry. Some of the dried chilies are sold to Tea gardens in Assam which is consumed by the tea garden workers.
- The price mark ups for dried Chili in Mizoram are as depicted in the table below:

Exhibit 45: The Price Mark-ups for Dried Chili in Mizoram

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production of dry chili	57	57
Average Selling price by Farmers	225	225
Mizo Commission agent	5	230
Packaging & transport cost	2	232
Commission by pheriwala	5	237
Losses @5%	12	249
Commission for trader in Baga-Assam	26	275
Final selling price		275

Source: Primary Survey, YBL Analysis

The Organic Movement in Mizoram

- The biggest strength for Mizoram (and most other NE states) to go Organic is that the state is organic by default. The farming practices are close to nature and use of chemicals is negligible.
- However, one of the key challenges which Mizoram faces in terms of Organic as well as sustainable agriculture is the practice of Jhum cultivation. This practice is not only environmentally detrimental, it is also prevention organic certification, which certifies the land under cultivation. However due to continuous shifting, the certification becomes null and void.
- The initiative of Organic farming is not new to the state of Mizoram. Community Development Action and Reflection (CDAR) an active NGO at Mizoram working in the field of capacity building of the farmers, works across the entire value chain of organic sector.
- CDAR helps farmers in terms self-help group formation, market linkage, organic farming, and bridge creation between govt. policies and farmers.
- Till now CDAR has worked for 5,440 farmers in 69 villages of Mizoram and converted 15,400 Acres of land into organic. However, due to lack of funds the certification could not be renewed each year. CDAR has been able to reach out to the big Indian organic players to establish market linkage for its produce. However, there have been challenges with the volume and organic certification.
- In the field of post-harvest agro-processing, CDAR has established the first Post-Harvest Agro Processing Unit in the state in 2007 for processing of ginger, turmeric and Bird eye chili. It is now setting up a new packhouse in Aizawl for ginger, turmeric and oranges.

The initiative of Organic farming is not new to the state of Mizoram. Community Development Action and Reflection (CDAR) an active NGO at Mizoram working in the field of capacity building of the farmers, works across the entire value chain of organic sector.

- The department of Agriculture has now taken up the role of nodal agency for promoting organic cultivation.

Processing and Storage Infrastructure in Mizoram

There are a number of units that have been established in the state of Mizoram to process/store perishables. Majority of these are cold storages which have been established under government subsidies and are operated by the government department themselves. However, due to lack of technical know-how and inefficient management many of these units are lying vacant and are out of operation.

On the other hand there are a few successfully operated units, one of the which is operated by CDAR in Aizawl. This unit processes ginger and turmeric into their dried forms.

Exhibit 46: Existing Post Harvest Infrastructure in Mizoram

Sl No.	Unit & Ownership	Location of the unit	Installed capacity	% utilization	Comments
1	Mizoram Food Processing Industry	Aizawl	1MT/day	Dried Ginger Powder, Flakes, Turmeric Powder	Fully operational, run by CDAR
2	Pack House-NLUP/ Govt.	Tuirial, Aizawl	1000MT cold storage and	On-going project	It will be used for perishables (Ginger, turmeric and oranges) once it gets functional. Details provided in the next table.
3	Cold Storage-MIFCO	Chhingchhip	700 MT	0	Part of Mizoram food park. Not in use since inception
4	Cold Storage-Trade & Commerce	Sihphir	Not functional	0	Very old. Obsolete machinery, initially used for squash. Power was also an issue (initially). Has been closed down.
5	Cold Storage-Govt.	Champhai	1000 MT	0	Handed over to NLUP. Not working since inception
6	Cold Storage-Horticulture	Serchhip	1000MT	Not functional	Handed over to NLUP. Not working since inception
7	Cold storage	Kolasib, vairengte	>1000 MT	Unutilized at all	Traders from Silchar use to some extent. At present the broom traders are using for storage.

Source: Government of Mizoram, Primary Interaction with Marketing Task Force

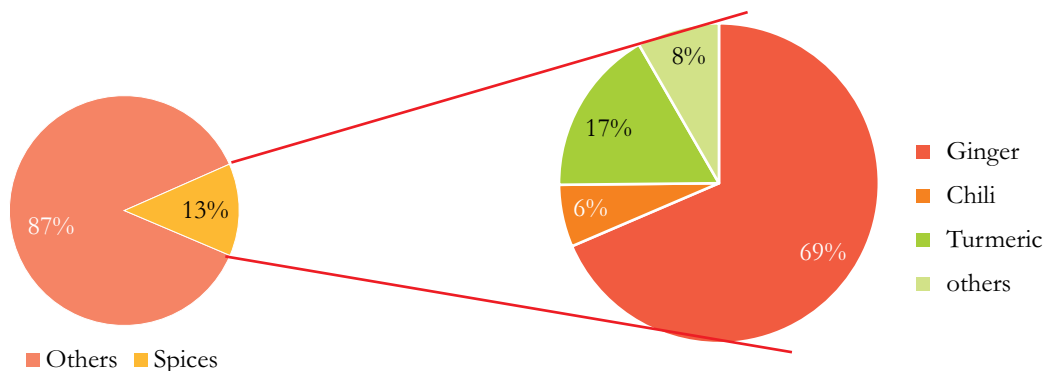
4.5 Nagaland

Nagaland became a full-fledged state on 1st December 1963. The state shares international border with Myanmar. The state also shares border with Assam, Arunachal Pradesh and Manipur. Total area of the state is 16,579 square kilometers. State capital is located at Kohima and Dimapur is the largest city in the state.

Agriculture is the mainstay of the state. Principal crops include rice, corn, millets, pulses, tobacco, oilseeds, sugarcane and potatoes. Between 2002 and 2012 state has seen compound annual economic growth rates of 10%. Spices are one of the main cash crop of the state. Major spices crops are ginger, garlic, turmeric, chili and large cardamom. The area under major agricultural crops increased from 4, 01, 510 hectares in 2011-12 to 4, 29, 790 hectares in 2015-16. During 2016- 17, the area under major agricultural crops is estimated to have increased by 11, 200 hectares.

Most of the state is mountainous except 9% of the total area bordering Assam valley. Area under agriculture is 440,990 Ha (26.6% of land area) of which 22% is under horticulture crops. Spices contribute around 13% to the total production of horticultural crops. Within the spices category ginger and chili are the key crops.

Exhibit 47: Share of Spices in Horticulture Production Basket of Nagaland (2016-17)

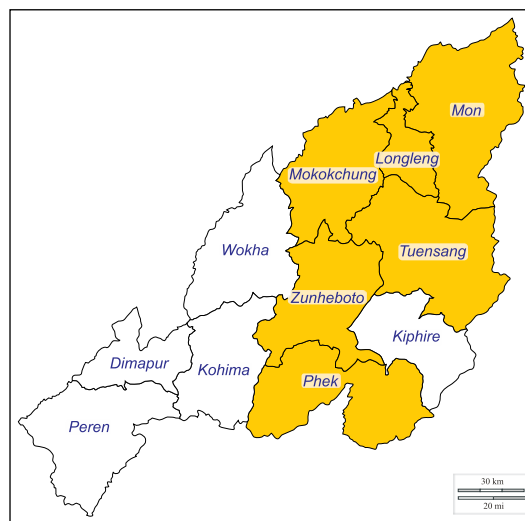


Source: Ministry of Agriculture and Farmers Welfare, 2016-17

Ginger

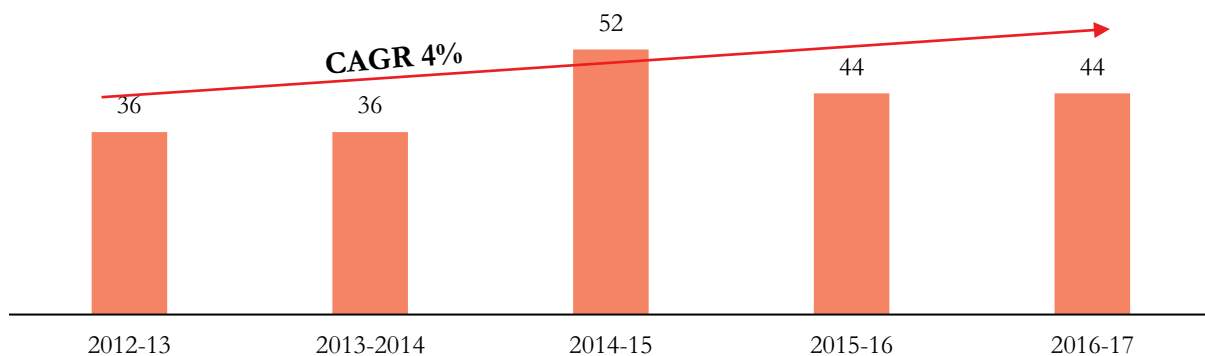
- Nagaland produces around 44,000 MT of ginger which accounts for about 5% of total ginger production of the country.
- The crop covers more than 25% of the area under spices in the state and 69% of total spice volume produced in the state.
- More than 90% of the ginger produced in the state is surplus to be marketed further through traders in Guwahati and Kolkata via Dimapur and Kohima.
- Ginger is grown in all districts of the state, however the districts include Phek, Mokokchung and Tuensang.
- The area and production under Ginger has seen an increasing trend during the last 5 years. 2014-15 witnessed a steep increase and then a normalization was attained in 2015. The production increased at a CAGR of 4% during the past 5 years.

Exhibit 48: Major Ginger Producing Areas in Nagaland



Source: Dmaps

Exhibit 49: Trend for Ginger Production in Nagaland (000 MT)



Source: Ministry of Agriculture Cooperation

Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Cost of Production

The farm gate price for ginger varied from INR 10-20/Kg. Sometimes ginger is left un-harvested in the fields if the prices are too low. Low profit margins sometimes compels farmers to not harvest the crop.

Exhibit 50: Cost of Production for Ginger in Nagaland (per kg)

Sr. No.	Particulars	Amount (in INR/kg of produce)
1	Land preparation	0.75
2	Planting Material and sowing	2.00
3	Chemical Inputs	NIL
4	Irrigation	NIL
5	Labour-Intercultural Operations	1.25
6	Labour – harvesting and transportation	4.00
7	Cost of Production for fresh turmeric (per kg)	8.00

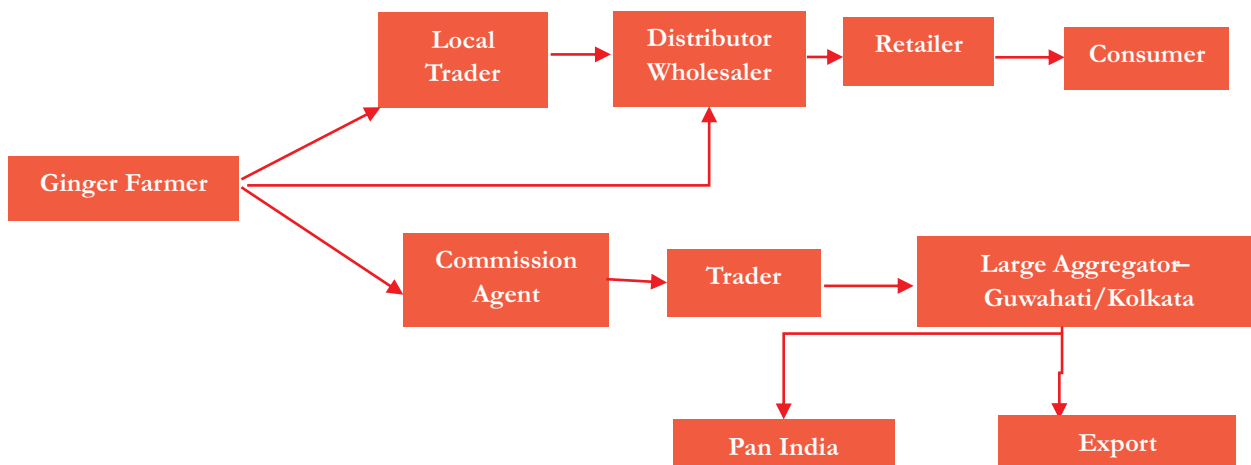
Source: Primary Survey, YBL Analysis

Marketing

- The marketing channel in Nagaland is dominated by local traders who collect the produce from the farm gate and supply it to the key hubs in Nagaland- Kohima and Dimapur from where the produce is traded off to Guwahati and Kolkata.

- However, one major issue in Nagaland is that non-state actors make it difficult for businesses to run successfully. They tax at various points and hence, only the people with a close understanding with them are able to collect and market the produce. Taxing at various points make the produce unviable to market it outside.

Exhibit 51: Marketing Channel for Ginger in Nagaland



Source: Primary Survey, YBL Analysis

- The price mark ups for Ginger in Nagaland are as depicted in the table below:

Exhibit 52: Price Mark-ups for Ginger in Nagaland

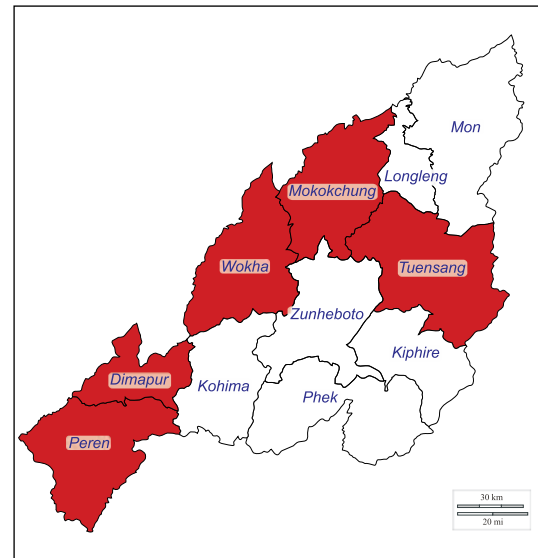
Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Cost of production	8.0	8.0
Average Selling price by Farmers	11.0	11.0
Loading/unloading charges	0.5	11.5
Packaging Cost	0.3	11.8
Wastage (@ 5%)	0.6	12.3
Commission Agent Margin (@ 5%)	0.6	13.0
Trader Margin (@ 10%)	1.3	14.2
Transportation Cost to large markets	3.0	17.2
Large Aggregator's margin (20-30%)	4.0	21.2
Wastage (@ 1%)	0.2	21.5
Final price		21.5

Source: Primary Survey, YBL Analysis

Naga King Chili

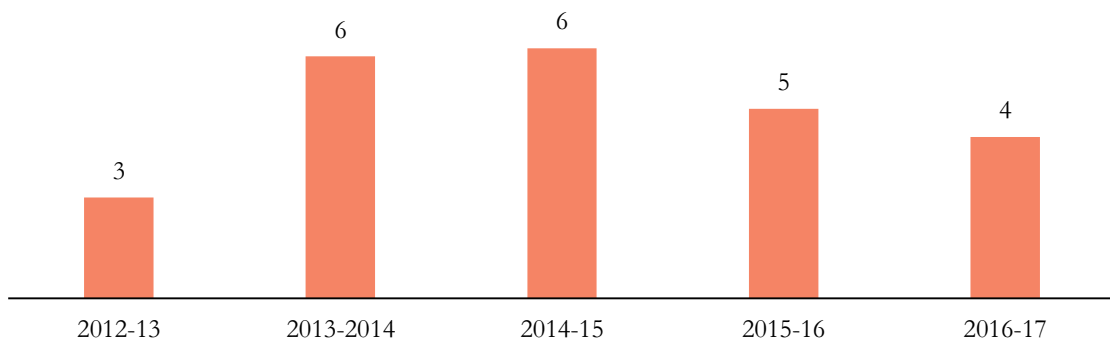
- Naga King Chili is the most unique spice of Nagaland. The state has received GI tag for Naga King Chili in 2008.
- In terms of volume it is third largest spice of Nagaland but the most valuable one.
- Nagaland produces about 4000 MT of Naga King Chili.
- 70% of the chili is surplus and marketed. The surplus is marketed by traders in Kolkata and Guwahati via Dimapur and Kohima.
- Key production clusters are Peren, Dimapur, Mokokchung and Tuensang.

Exhibit 53: Major Chili Producing Areas in Nagaland



Source: d-maps.com

Exhibit 54: Trend for Chili Production in Nagaland (000 MT)



Source: Ministry of Agriculture Cooperation, Department of Horticulture, Nagaland

- Yield of Naga Chili is 4-7 MT/ha. Yield can go upto 9 MT/Ha with adoption of good agricultural practices. It is labor intensive crop and labor cost has gone up in recent years.
- This crop is available throughout the year as it is grown both in Rabi as well as Kharif season. Crop of Rabi season is better than Kharif season.

Seasonality

Rabi Crop

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Kharif Crop

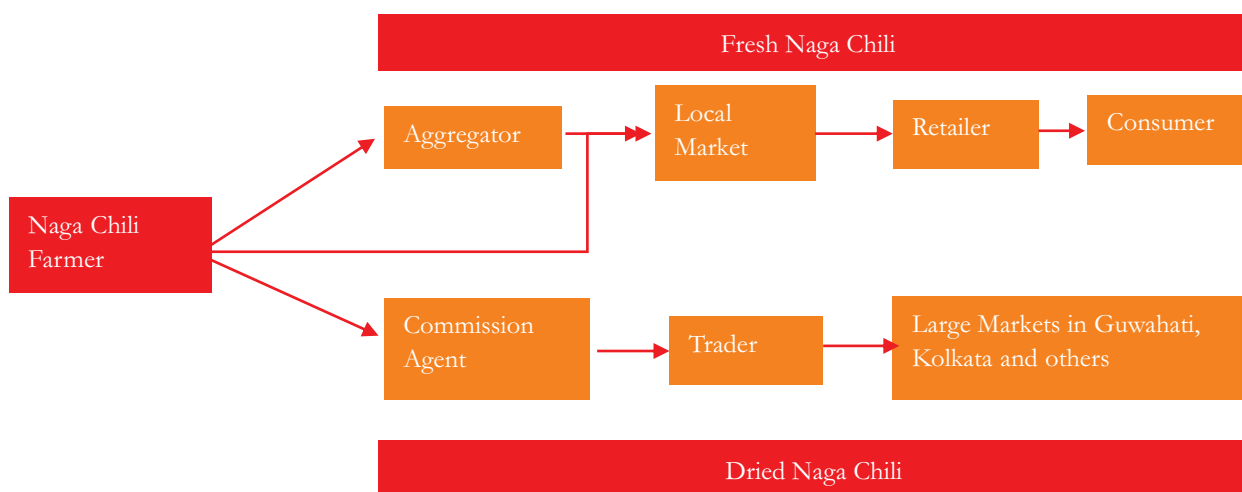
Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Marketing Channel

- Chili, as a spice and processed product offers ample scope for value addition. Small scale cottage scale industries by local entrepreneurs are involved in making Naga chili pickle or bird's eye pickle. The target for these products is the local market as well as other markets in the NER.
- They sell these products in local markets In Manipur and Nagaland farmers carry fresh chili from farms to local markets. The preferred mode of transport is through road. The gunny bags filled with chili are loaded onto the roof of vehicles and sent to the nearby markets.
- It has been observed that during transportation of the fresh produce, there are nearly 5% post-harvest losses due to improper handling.
- Chili processing is limited to making chili pickle and a limited number of processing plants are operating at present, primarily in making chili pickle.

Marketing Channel-Fresh Naga Chili



Source: Primary Survey, YBL Analysis

Exhibit 55: Price Mark-up for Fresh Naga Chili in Nagaland

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Average Selling price by Farmers	140.0	140
Aggregator's Margin (@5%)	7.0	147
Transport to Local Market	2.0	149
Cost of Wastage till local market (@5%)	7.5	156
Wholesaler's Margin (@10%)	15.6	172
Wastage at wholesaler level (@2%)	3.4	175
Retailer's Margin (@ 20-30%)	43.9	219
Wastage at Retailer's Level (@5%)	11.0	230
Final price		230

Source: Primary Survey, YBL Analysis

Exhibit 56: Price Mark-up for Dried Naga Chili in Nagaland

Component	Amount (INR/Kg)	Price Built-up (INR/kg)
Average Selling price by Farmers	1000.0	1000.0
Loading/unloading charges	0.5	1000
Packaging Cost	0.3	1000
Wastage (@ 2%)	20.0	1020
Commission Agent Margin (@ 5%)	51.0	1071
Trader Margin (@ 10%)	107.2	1179
Transportation Cost to large markets	5.0	1184
Large Trader's margin (15-25%)	236.8	1420
Final price		1420

Source: Primary Survey, YBL Analysis

The Organic Movement in Nagaland

- To promote organic farming, Mission Organic Value Chain Development for North East Region (MOVCD-NER) has been launched by the Ministry of Agriculture and Farmers Welfare. Nodal department for implementation of the scheme is the State Agriculture Department. INR 485 lakhs was allocated for implementation of this scheme during FY 2016-17 and the target crops are Pineapple, ginger and large cardamom covering initial area of 1,800 Ha in Nagaland.
- For the next two years, area of 6,000 Ha is being developed for organic certification. For this training programs are already being implemented. These crops include Rice, ginger, chili, soybean, Kholar (Rajma), turmeric, large cardamom. Pineapple etc.
- Efforts are on to help the farmers to get the premium for their produce. Various agencies and departments including Nagaland Industrial Development Corporation Limited (NIDC), Agriculture department, and horticulture departments are working at their level. Coordinated efforts are being made to help out the farmers. Growing certified organic produce is bit more tedious job as compared to normal farming. Until and unless there is premium on the produce, farmers will not be motivated to take up the additional efforts. At the same time to get the premium there need to be certain minimum quantities to be marketed so that the cost of overheads can be distributed over the larger volumes and benefits can be passed on to the farmers. Government understands this issue and hence subsidies and support is being provided to the various agencies working on it.
- Most of the state is naturally organic, some refer to it as default organic as well. Because of aforementioned logistics reasons fertilizers also cannot reach the farm. This weakness is being used to convert it to organic.
- Currently around 1,300 Ha is Certified Organic area in Nagaland of which 1000 Ha is under Pineapple. In Spices efforts are going on for Ginger, Turmeric and large cardamom as these have been identified as focus spices.

Under organic spices, ginger and large cardamom are focus crops. 500 Ha is available in Hakchang cluster under Tuensang district scheme for ginger and 500 Ha is earmarked for large cardamom in Phek district.

- The state is currently facing challenge in terms of marketing of organic produce and also lack of proper infrastructure. NERAMAC had received a contract to supply 700 MT of ginger to a private firm but they could supply only half the quantity due to lack of adequate quantities produced and lack of proper infrastructure for collection.
- People are not going for organic as there is certain cost and no remuneration for being organic. Record keeping is additional burden on the farmers who are not well educated.
- The following is the plan for converting the farmlands into organic in the coming 2 years.

- 500 Ha land in Phek district is under process to be converted to organic large cardamom. 500 Ha land in Tuensang district is under process of conversion for organic Ginger.

Crops	Target Area (Ha)
Ginger	2,500
Chili	350
Turmeric	150
Large Cardamom	1,000

- Also INR 6 crores is earmarked for development of processing infrastructure. It will go towards development off Common Facility Centers (CFC).

Collection centers will be developed in various areas. NIDC is looking for private partners to run collection centers on PPP model. NERAMAC is also planning for e-Auction of cardamom.

- Like Mizoram, Nagaland is also impacted by hum cultivation which is deterrent for organic as well as sustainable agriculture.

Processing Infrastructure in Nagaland

Exhibit 57: Spices Processing Units in Nagaland

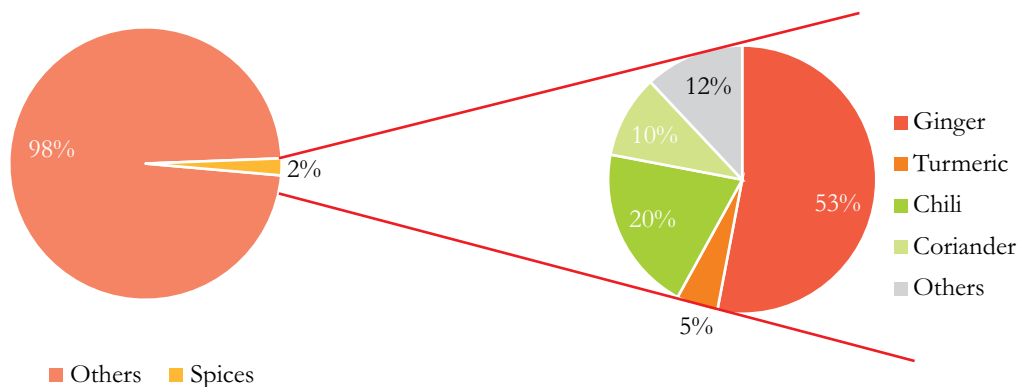
State	Crop	Unit	Products
Nagaland	Chili	Naga Herbal and Spice, Dimapur	Chili pickle
Nagaland	Chili	Naga Fragrance Private Limited, Dimapur	Chili pickle
Nagaland	Ginger	L. Doulo Builders & Suppliers Co. Private Ltd., Dimapur	Ginger Powder

Source: Primary Survey

4.6 Uttarakhand

Uttarakhand, the 27th State of the Union of India was carved out of the 13 north Western districts of Uttar Pradesh on 9th November 2000. The state is known for its scenic beauty and is also known as “Devbhoomi” due to its shrines, temples & places of worship and meditation. The state is blessed with diverse agro-climatic endowments, the plains and hills present differing scenarios for agriculture while commercial agriculture is practiced in the plains. The hill farmers mainly practice subsistence farming. The hills practice mixed cropping, while in the plains in a given season single crops are grown mostly. The state produces a host of commodities including a wide range of horticultural crops. Spices do not contribute a large chunk to the horticulture basket. The share of spices in the horticulture basket is only 2% with the key contributors being Ginger, Coriander, Turmeric and Chili.

Exhibit 58: Share of Spices in Horticulture Production Basket of Uttarakhand (2016-17)

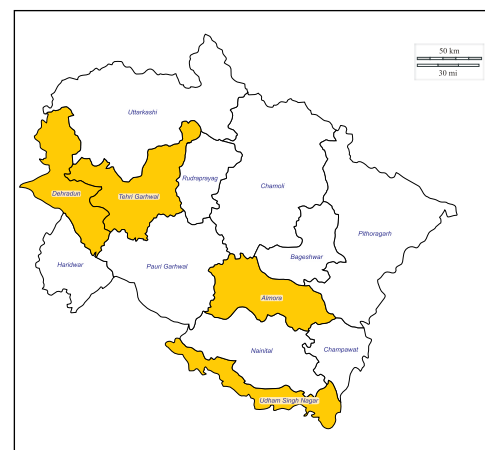


Source: Ministry of Agriculture and Farmers Welfare, 2016-17

Ginger

- Uttarakhand produces around 19,000 MT of ginger annually. The crop contributes around 53% to the total spices production of the state. Nearly 90% of the produced ginger is surplus and is marketed further, majorly to traders.
- The key clusters producing ginger include Dehradun, Tehri, Almora and Udham Singh Nagar districts of the state.
- Ginger is one of the important cash crops grown in the state. However, the production of the crop has reduced over the last 5 years. This is largely due to abandoning of agriculture as an occupation especially in the hilly districts of the state.

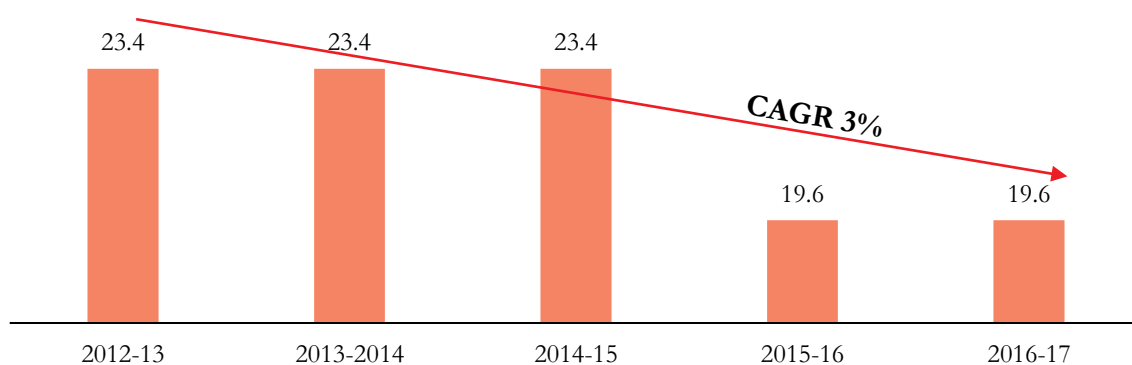
Exhibit 59: Major Ginger producing areas in Uttarakhand



Source: Dmaps

This is largely due to abandoning of agriculture as an occupation especially in the hilly districts of the state.

Exhibit 60: Trend in Ginger Production in Uttarakhand (000 MT)



Source: Ministry of Agriculture and Framers Welfare

There are two major varieties of ginger namely Maran and Rio de jenario that are most popular in the state.

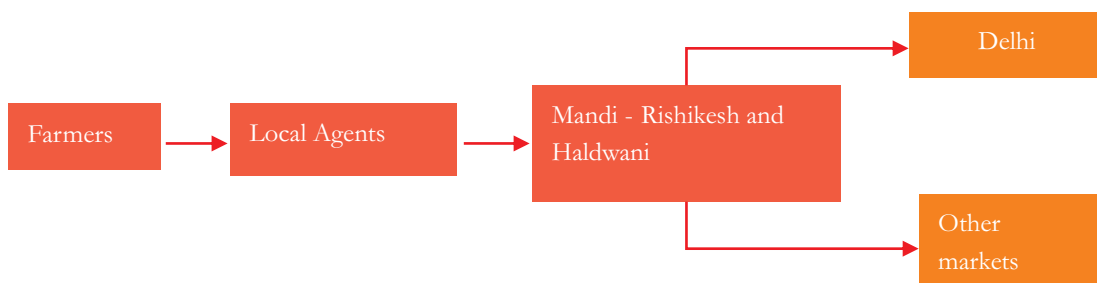
Seasonality

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

	Sowing
	Harvesting

Marketing Channel

Exhibit 61: Marketing Channel for Ginger in Uttarakhand



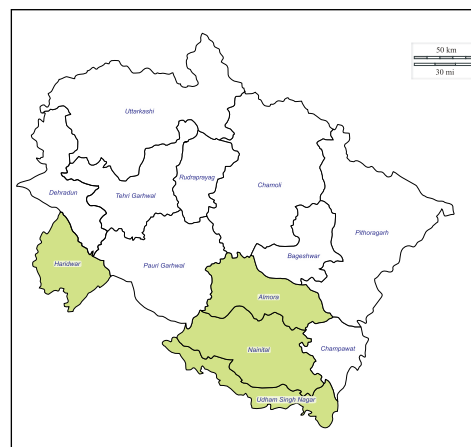
Source: Primary Survey, YBL Analysis

- The key trading hubs for Uttarakhand are Haldwani, Rishikesh and Dehradun. The farmer’s produce is collected by the middle men from the villages and transported to the respective mandis i.e. Garhwal region produce to Rishikesh and Dehradun market and Kumaon to Haldwani market.
- From the respective mandis, it is being traded across the markets, mostly Delhi. The organic as well as conventional produce both are traded mostly through the same channel.

Chili

- Uttarakhand produces around 8,000 MT of chili annually. The crop contributes around 18% to the total spices produced. Nearly 70-80% of the produced chili is surplus and is marketed further, majorly within the state through traders.
- The key clusters producing turmeric include Nainital, Udham Singh Nagar, Almora and Haridwar.
- The area and production under chili cultivation has remained constant over the years in Uttarakhand.

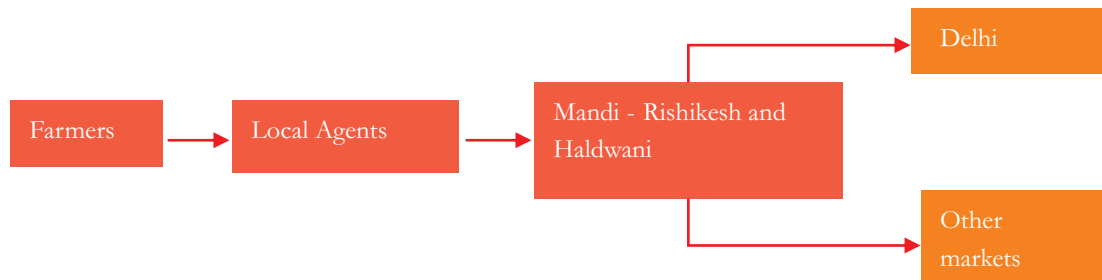
Exhibit 62: Major Chili producing areas in Uttarakhand



Source: d-maps.com

Marketing Channel

Exhibit 63: Marketing Channel for Chili in Uttarakhand



Source: Primary Survey, YBL Analysis

The Organic Movement in Uttarakhand

- Uttarakhand is all set to launch its own Organic Agriculture Act making it the second state in India, after Sikkim, to have its own Act. It will be a major leap in transforming Uttarakhand into a fully organic state of the country and the Act will lay thrust on cultivating indigenous organic products. The Uttarakhand Organic Agriculture Act has been modeled on the one implemented by Sikkim.
- The Organic Agriculture Act aims at organizing the unorganized organic sector of Uttarakhand which has very high potential for buyers of national and international markets. The Act will regulate the private agencies, NGOs, etc. engaged in export, trade and processing of organic produce. Also, the entire process of organic certification for the farmers would become extremely easy with the induction of Organic Act.
- In Uttarakhand, almost 40,000 Ha of farming land has already been turned into organic and about 80,000 small and medium farmers are already committed towards the go-green initiative of the state government. The state has maximum organic farms in Rudraprayag (3,422 hectares) followed by Pithoragarh (3,241) and Uttarkashi (2,966).
- The organic produce from the state is bought by over 30 different organic companies, who are based out of Karnataka, Delhi NCR, Haryana, Maharashtra and Gujarat. As per the Uttarakhand State Organic Board, the farmers receive a good premium for their produce, especially through amaranth, millets and medicinal and aromatic products.

In Uttarakhand, almost 40,000 Ha of farming land has already been certified organic.



Exhibit 64: Key Clusters for Organic Spices Production in Uttarakhand

Sl. No.	District	Cluster	Crop	Area(00Ha)	Production(00MT)
1	Tehri	Kirtinagar 1	Ginger	46	448
2		Kirtinagar 2		34	418
3	Nainital	Cluster 1	Ginger	1.1	5
4			Chilly	3.72	0.63
5	Tehri	Narendra Nagar	Turmeric	2.98	5
6			Ginger	3.59	9.82
			Chilly	1.72	1.14
7	Nainital	Kotabagh1	Ginger	5	39
			Turmeric	1	4
		Kotabagh2	Ginger	7	44
			Chilly	1.64	0.4
		Betalhat	Chilly	14	11

Source: Uttarakhand State Organic Board

Exhibit 64: Key Clusters for Organic Spices Production in Uttarakhand

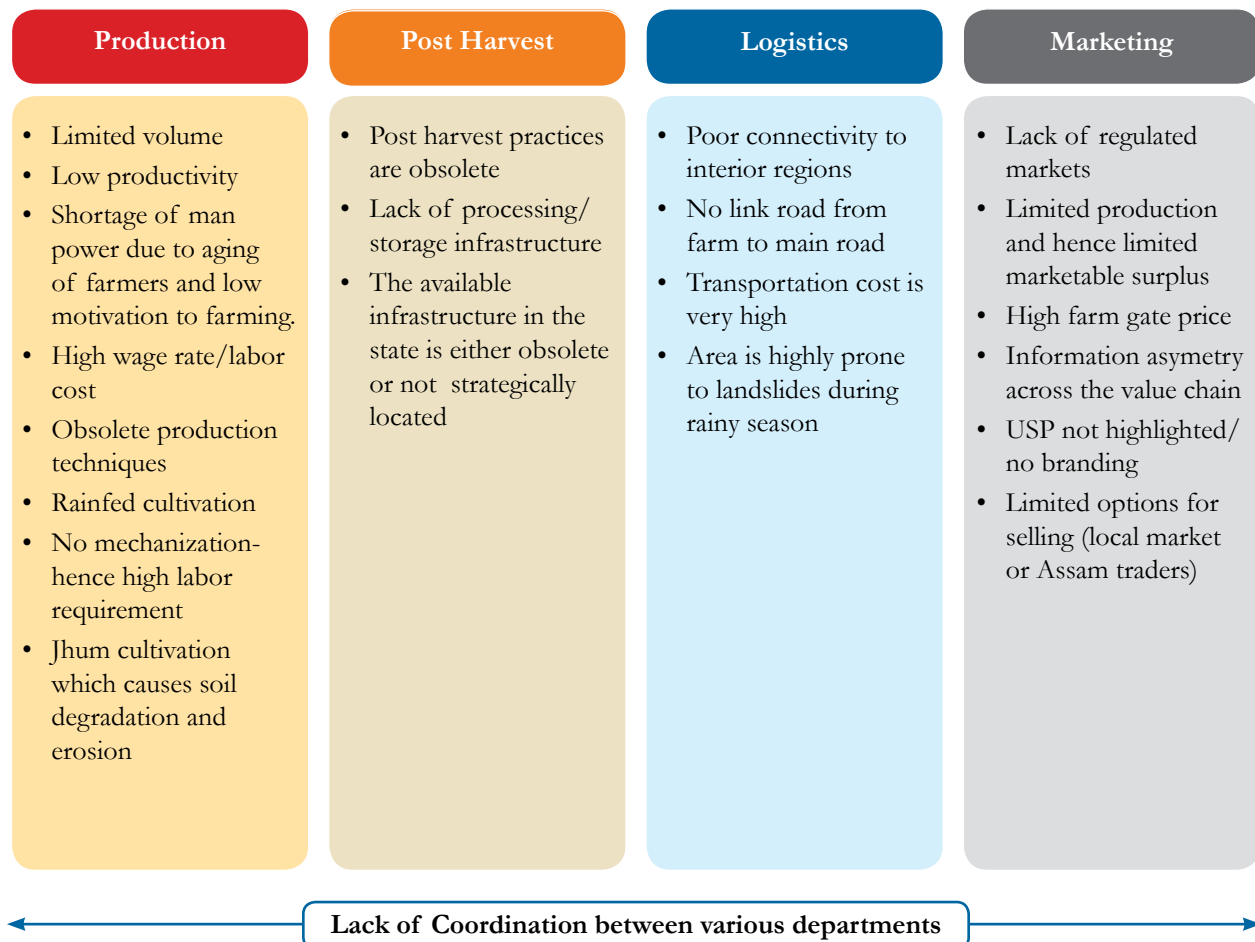
Year	Area under cultivation (Ha)
2015	11,000
2016	15,000
2017	26,000

Source: Uttarakhand State Organic Board





5 Challenges across the Value Chain



5.1 Production

Low productivity

The agricultural productivity in the NER is comparatively lower than the other states. The major reason being its terrain, low usage of fertilizers & plant protection chemicals, lack of good agri practices, low mechanization, rain-fed agriculture, use of conventional varieties etc. While some of these factors like low usage of fertilizers and plant protection chemicals come in a positive way for the region, the other factors require immediate interventions so that the productivity can be enhanced. For most of the crops, NER's productivity is much lower than the India average productivity.

Exhibit 66: Productivity Comparison between NER and India

Commodity	NER Productivity (MT/ha)	India Productivity (MT/ha)
Ginger	6.70	5.37
Turmeric	2.82	4.50
Mizo Chili/Chili	0.95	2.11
Mandarin Orange	7.38	12.36
Arecanut	1.06	1.66

Source: National Horticulture Board

Shortage of man power due to aging of farmers and low motivation to farming

Farming has become the least attractive selection for most of the youth of NER, which has led to a shortage of manpower (even family manpower) in the farming system. The youth has moved over to other livelihood options as the farming system does not give the young population desired returns and is labor intensive.

High wage rate/labor cost

The agricultural practices followed in NER are very labor intensive and the labor cost takes the lion's share in the cost of cultivation for majority crops. As per the labor bureau, NER is one of the state with the highest prevailing wage rate. The minimum wage rate is close to INR 270/day, while the maximum goes up to INR 460/day for unskilled/semi-skilled labor.

No mechanization- hence high labor requirement

To add to the shortage and high wage rate in NER, the farm mechanization in the state is negligible, leading to high labor requirement. The use of animal power is also very limited in the North East, unlike other hilly states, thus the entire agricultural operation depends on manual labor. The low usage of farm equipment in the region is largely because of incapability of small farmers to buy implements, unavailability of farm equipment in the hinterlands. Also, customized machinery that works well for the hilly terrains of NER is unavailable. Small entrepreneurs fabricate small tools on need basis and sell it locally.

In the short term, a limited opportunity can be envisaged in fabricating customized machinery (equipment and hand tools) that reduce drudgery, improve comfort level of manual laborers and is cost effective for producers. However, the opportunity will remain very small and limited, unless the tool/equipment brings down the cost of production significantly for the producers. Similarly, operating a Custom Hiring Centre (CHC) (where farmers can rent out equipment on usage basis) also remains an unviable option for the NER, as profitability is driven significantly by the number of users (which will remain very small in the region to drive viability). The CHC model is yet to gain prominence even in other parts of India which are much easier to operate and have larger user base. NER is comparatively a difficult region to operate such service centers. However, a pilot may be established to assess the demand for such services in the region.

Sikkim Government is planning to establish CHCs through the FPOs, however the on ground implementation is yet to materialize.

However an interesting area of intervention could be raising awareness about new tools developed by the ICAR which are affordable, user friendly and specifically women friendly. The state Government may look at distributing these tools are also creating awareness on their use.

Obsolete production techniques

The farming techniques in NER are still very traditional and obsolete. There is negligible use of high yielding variety seeds, farm mechanization, irrigation, practice of good agricultural practices, post-harvest management etc. all of which has led to almost stagnant production and productivity over the years.

Jhum cultivation

Jhum cultivation, which is the traditional practice of farming causes soil erosion when practiced on steep slopes and hill tops. The loose top soil along with nutrients is washed away during the rainy season.

5.2 Post-Harvest Management

Post-harvest practices are obsolete

The farmers in NER do not practice any significant post-harvest management or storage. Their practices are only limited to farming. In some cases like turmeric and chili some farmers do practice the post-harvest management (blanching, drying), but through primitive techniques, which again are labor intensive.

Lack of processing/storage infrastructure

The NER lacks the processing/storage infrastructure that is accessible to the farmers and is strategically located for them to utilize it. There are a number of units that are situated in various parts of NER, however most of them are not strategically located or could not be run efficiently by the government machinery or have

Available infrastructure- either obsolete or not strategically located

The infrastructure that is available is not fully utilized because of management issues and non-strategic locations.

5.3 Logistics

Poor connectivity to interior regions and high transportation cost

The roads to the interior regions of the NER are very poor and most of the region lacks all weather roads. All weather road connection reduces the time of transporting the perishable products like milk, vegetables, poultry products, etc. and ensures a remunerative price for such commodities throughout the year to the producer and a regular supply to the consumers.

No link road from farm to main road

Development of rural roads to connect the villages with the highway and nearby towns is very essential for the development of agri sector in the NER. The farmers have to bear a huge labor cost for carrying the inputs to the farm and the output from the farm to the main road. This adds to the cost of production of the produce.

Area is highly prone to landslides during rainy season

The heavy rainfall and frequent landslides during the rainy season puts a halt to the entire trade. Many of the poor communities are isolated by distance, bad road conditions, lack of or broken bridges and inadequate transport. These conditions make it difficult for people to get their goods to market and themselves to place of work, to handle health emergencies, to send children to school, and to obtain public services.

5.4 Marketing

Limited volume

The NER produces an array of produce; however the marketable surplus is not very high for most of the products. This limits the procurement opportunity for any large player who would require a large and consistent quantity. Also since the supply is limited, while the demand of the state, nearby states and neighboring countries is collectively high, the prices are also high for the commodities.

High farm gate price

Other than the reason stated above, the reason for high farm gate prices is the higher cost of production on account of high wage rate of labor and extensive labor requirement for any agri activity.

Lack of regulated markets

There are no (or very few) regulated market in the NER. This is a pain point for the private party as there is no point of contact for a new entrant and no place from where procurement can be done.

USP not highlighted/ no branding

The product of NER is unique and of high quality, especially the turmeric (which has a very high curcumin content), however this has not been the unique selling proposition and has never communicated to the consumer.

Limited options for selling (local market or Assam traders) and Information asymmetry across the value chain

The value chain of majority of the commodities produced in NER is dominated and dependent on the Assam traders. They have been controlling the trade channel since ages. Most of the times, the trade channel through the Assam trader is the only opportunity available for the farmer. This has led to information asymmetry for the farmers, as all traders from Assam quote similar prices and farmers are unaware of the actual prevailing prices in other markets.





6 Value Proposition for Going Organic/Sustainable

6.1 Why Organic for North East and Uttarakhand

- The biggest strength for most NE states and the hill state of Uttarakhand to go Organic/Sustainable is that the practices are organic/sustainable by default. The farming practices are close to nature and use of chemicals is negligible.
- Industry estimates that the productivity during conversion phase to organic farming declines (usually up to 30%). This is primarily due to reduced application of inputs and a lag time for the crop to adapt to the change. While in most cases the productivity enhances using sustainable agricultural practice.
- In case of NER and Uttarakhand (especially hill state), since no/negligible plant chemicals are used as fertilizers and pesticides, the yield drop is unlikely or will be minimal. In fact due to the good and sustainable agricultural practices and application of bio-fertilizers, it is quite likely that the productivity will enhance to a certain extent.

Private players shall be keen to invest in the NER/Uttarakhand if they receive products that are niche, high value, can command a premium so that their cost of procurement and logistics is justified from the state. “Organic” shall be the response to all these requirements.

This also needs to be integrated with assured supplies by the farmers to the processing unit to maintain a constant inflow of raw material.

- On the revenue front, it is estimated that organic products fetch an average 30% premium over conventional products. This premium gives the private players a chance to rationalize their high procurement and logistics cost from the NER. A decent proportion of this premium needs to be transferred to farmers so that they sustain the organic practice and give an assured volume/quality to the company. However, in the current scenario the premium reaching the farmers is almost negligible.

6.2 Government Initiatives

- There is no doubt on the fact that the North Eastern Region and the hill districts of Uttarakhand are organic by default as farmers do not use any chemical inputs (or very limited usage) on their field. The logistics challenge and low family incomes never diverted the tract of agriculture in the region towards usage of chemicals.
- This disadvantage has today proved to be a major advantage and a much sought after agricultural practice.
- A few state governments like those of Sikkim and Mizoram have also taken major initiatives to let the advantage prevail, by legally banning the inflow of chemicals for the agricultural sector
- The Government of Mizoram in 2004 passed the Organic Farming Act 2004 for banning agri chemicals in notified areas. The state made history by becoming the first in the country (even before Sikkim) to legislate for turning its entire agricultural produce organic. However, in terms of certification it now lags behind many other states.
- Sikkim went ahead with certifying the state as organic and became the first state in India to be Organic. Mizoram currently is nowhere close to it. Even before the Act was passed Mizoram was amongst the lowest consumers of plant protection chemicals and mostly the usage was on rice and vegetables grown in plains.

6.3 Cost Benefit Analysis: The Farmers Perspective

Unlike other parts of India, where agriculture is practiced in a more commercial manner, the dynamics of organic agriculture in the north eastern region are significantly different. The key differences that emerge in the sustainable and organic farming dynamics are:

- **Input Usage:** Unlike other parts of the country, the farmers in the north eastern region do not use agri inputs. Thus, the cost incurred on chemical inputs which usually goes down for other farmers when they switch to organic farming remains the same for the NE farmer. In fact, SOPs under organic farming as well as sustainable farming suggest the usage of organic fertilizers and plant protection methods, which when followed increases the cost of agri inputs for the farmers.
- **Yield deviations:** Under conventional practices, switching over to organic farming results in yield losses of 10-30% (recent studies suggest that if proper SOPs are followed this yield reduction can be negated, but in an overall scenario farmers do face yield reductions). However, in the North east India, using the good agricultural practices under organic and sustainable farming and judicious usage of bio-fertilizers/chemical fertilizers (as in case of sustainable farming) is likely to keep the yield levels at par or rather enhance it. This is largely because of additional nutrients added in the form of bio-inputs and good agricultural practices followed, which are not practiced in their conventional farming regime.
- **Labor cost:** The per day labor cost in the north eastern region is much higher than the labor cost in other states of the country. Organic and sustainable Agriculture being more labor intensive, and mechanization being minimal in the hilly terrain, leads to a steep increase in the cost of cultivation of crops.

Cognizant of the factors mentioned above, a brief cost benefit analysis has been primed taking into account the basic input and output costs for conventional as well as sustainable farming and organic farming (on Jhum Land).

Exhibit 67: Cost Benefit Analysis- Conventional vs. Sustainable vs. Organic

Cost of Cultivation Per Acre -Turmeric	Conventional*	Organic**	Sustainable**
Land Preparation	3500	4200	4200
Planting Material (@ INR10/kg)	11600	10100	7450
Sowing Cost	5250	5250	5250
Nutrient cost	0	20000	15000
Intercultural Operations (@ 350/labor day)	10500	10500	10500
Crop Protection	0	1000	6000
Harvesting cost	21000	21700	22750
Yield (Qt/acre)	70	77	84
On farm Cost of Cultivation	51850	72750	71150
On farm Cost of Cultivation (@1% farm loss)	52374	73485	71869
Revenue Generation	84000	101640	105840
Losses-Storage and Transportation (@1.5%)	778	1091	1067
Profit	30849	27064	32904
% increase over conventional		-12%***	7%

Source: YBL analysis, Industry Insights

*Based on existing practices

** Based on ideal practices- the cost for sustainable practices has been derived from a research paper of TNAU, while those for organic cultivation have been extracted from the estimates provided by the Government of Sikkim

Besides the cost incurred on Organic cultivation, there is an additional cost of certification that has to be borne by the farmers/ farmer groups. The cost varies with the certification requirements, geography, certification agency and also the beneficiary. An individual small farmer has to incur an additional cost of around INR 10,000-15,000 for certification of his land. This is tentative pricing as the certification cost is based on the man-days required for preparation, travel, prepare the report, certification etc. Farmers who are a part of a larger group/ FPO, pay lesser for certification as the cost gets distributed over a number of farmers.

*** The negative returns in organic are largely due to increased cost of production due to use of bio-inputs, and passing on of minimal premium to the farmers. An increase in premium can lead to increased profitability to the farmers.

The above calculations do not consider the social and environmental benefits that accrue due to sustainable practices. The environmental benefits include biodiversity preservation, maintaining soil health, preventing unnecessary felling (specially on jhum lands), and reducing carbon footprint. Sustainable practices also try to improve the working and living conditions (overall well-being) of the farmers and other associated stakeholders largely through curbing child labor, managing wage disruptions, drudgery etc.

The following are the assumptions for the cost benefit analysis:

- The land preparation cost in case of sustainable and organic cultivation are on the higher side due to higher labor requirement for preparation of bunds and beds.
- The planting material requirement is minimum in case of Sustainable Agricultural practices, medium for organic cultivation and the maximum for conventional agriculture. Depending on the same the planting material cost varies.
- Nutrient cost in case of Organic Cultivation include cost of farmyard manure, cow dung, neem cakes and other bio- nutrients). In case of sustainable agriculture, the nutrient cost includes cost of chemical fertilizers including NPK in judicious amounts.

- For crop protection, the cost of bio-pesticides has been included in case of organic cultivation, while in case of sustainable agriculture the cost of anti-fungal, anti-bacterial chemicals as well as measures like trenching have been included.
- The harvesting cost in case of organic and sustainable practices is on the higher side due to increased labor cost for harvesting more crop.
- The yields are maximum in case of sustainable agri practices (20% higher than conventional yields), and organic cultivation (10% higher than conventional yields) due to use of external nutrients and plant protection inputs.
- The price for organic produce has been pegged 10% higher (organic premium), while that for sustainable has been considered at 5% higher than conventional (assuming that some branding is done and premium is charged for the sustainable produce).
- The certification cost for organic has not been considered in the calculation since the cost is borne (subsidized) by the state governments for the North Eastern states.

6.4 Challenges faced by Farmers in Converting to Organic Farming

- **Small and fragmented land holdings:** Fragmented land holdings due to which consolidation of yield is not optimal. Also, the scale of output viz a viz the investment required in going organic is considered to be detrimental by the farmer. Also, ownership of land is an issue in the region. 3rd party possession is rampant and the farmer is not able to invest in the land in terms of infrastructure, technology etc.
- **Cost of Cultivation:** In the context of north east and some pockets of Uttarakhand, farmers do not use inputs and hence the cost of production is largely contributed by the labor cost. Shifting to good organic agriculture and moving on to certified organic produce is an additional cost for the farmers in terms of additional labor cost, input cost as well as the certification cost.
- **Lack of awareness:** The farmers lack the overall awareness of certified organic products and seldom realize the benefits of going organic. The farmers who are willing for conversion to organic, lack the technical know-how for going organic and maintaining the protocols therein. There are several allied activities related to organic, which need to go hand in hand with the organic practices. Some of these include vermicomposting, seed treatment, proper storage techniques etc.
- **Price realization:** The conversion period for getting a land certified is a huge gestation period for the farmer. During the conversion period (which is around 3 years) the probability of getting a premium is very low. 3 years becomes a very long gestation period to actually receive increased income due to organic farming, after all the efforts are put in by the farmers. Moreover, even after conversion the margins do not improve significantly, as the trade channel for organic is also dominated by middlemen.
- **Capacity building:** The existing KVKs in the region are not deeply engaged and involved with the farmers at the grassroots level. Lack of awareness and connect with the farmers leads to farmers sticking to the conventional practices only.
- **Aggregation:** The NER as well as Uttarakhand suffer from low quantum of produce and issues in aggregation due to small and fragmented landholdings. The hilly terrain leads to time over run and additional logistics costs. This also becomes a primary reason for middlemen dominating the value chain, as farmers as well as farmer groups are unable to aggregate sufficient quantum for sale or processing.
- **Land ownership:** Land ownership is another challenge which limits the farmers/ laborers to invest on the land. Moreover, it becomes difficult for this category of farmers to actually reap the benefits of various schemes/ grants / financing options. In North East, the concept of community owned land is also very prevalent, with no single person owning the land.
- **Jhum Cultivation:** Jhum cultivation is a prominent practice in the North eastern region specially Mizoram and Nagaland. The practice of jhum involves clearing out on a part of the jungle, cultivating the land for 2-3 years and then moving out of that area to a new place where the soil is more fertile. This practice makes it difficult to certify one piece of land for organic certification as permanent cultivation is not practiced.

- The practice of shifting cultivation had contributed to large scale deforestation-disturbing ecological balance resulting in destruction of wild animals and their habitats, elimination of source of water and so on. To overcome this challenge, the State Government of Mizoram has come up with a very promising program called ‘New Land Use Policy (NLUP)’ to do away with the wasteful practice of jhum cultivation and faulty land use. It is a comprehensive project for inclusive development focused mainly amongst others, on a major overhaul of the economy through structural changes by weaning away farmers from destructive jhum practices to sustainable livelihood opportunities based on local resources, local know-how and keeping in view regeneration of resources.

6.5 Government Support

The North eastern region as well as the Himalayan states have been in focus for the central government. The difficult terrain and need for rapid development has pushed several support programs especially towards agricultural and livelihood development in the region.

Since independence, various governments have adopted varying strategies and plans to cater to the development of this region. One such major policy is the “Look East Policy” which was introduced way back in 1991 with an objective to cultivate extensive economic and strategic relations with Southeast Asian and East Asian nations and thereby counter the strategic influence of China on these nations. NER was envisaged as the gateway for the implementation of the policy and trade in agricultural commodities was envisaged as the starting point. With the new government coming in 2014, the focus of the look east policy has been realigned to give advent to “Act East Policy”. The NER now assumes a role of bridging the space between mainland India and Southeast Asian Nations. This has led to an increased emphasis on development of infrastructure in the region development of roads, expansion of air connectivity, opening of new trade routes with the neighboring countries etc. The increased trade activity as a result of the emphasis is expected to transform the economy of the region. Some of the key initiatives taken for the development of the NER include:

Ministry of Development of the Northeastern Region

- Formation of a dedicated Central Ministry of Development of the Northeastern Region (MDoNER) in 2001 (granted status of fully-fledged ministry in 2004). MDoNER has been created for the purpose of facilitating the relations and the work between the Central Ministries and Departments and the State Governments of the NER mainly with regard to economic development.
- Under the aegis of MDoNER the North Eastern Council (NEC) has been established, which is a statutory body for regional planning and development of the Region.
- North Eastern Regional Agricultural Marketing Corporation Limited (NERAMAC) – a Public Sector Unit (PSU) has also been set up under MDoNER. The objective of NERAMAC is to provide marketing support to farmers/producers of the region.
- North Eastern Development Finance Corporation Limited (NEDFi) – a public limited company provides financial assistance to enterprises for setting up of industrial infrastructure and agri allied projects in NER.

Mission Organic Value Chain Development for North Eastern Region

- Mission Organic Value Chain Development for North Eastern Region was launched by the MoAFW on 11th January, 2016. The key objective of the mission is to develop crop commodity specific organic value chain and address gaps in organic crop production, wild crop harvesting, organic livestock management and processing, handling and marketing of organic agricultural products with necessary infrastructural, technical and financial support.
- Another key objective of the mission is to empower 50,000 farmers of North Eastern Region through the creation of 100 Farmer Producer Companies (FPCs) and equip such companies with full value chain under its ownership.

Special incentives under Kisan SAMPADA Yojana and other schemes launched by NHB/NHM

- The North eastern states as well as the hill state of Uttarakhand, both receive an extra grant amount (of 15-25%) from the Ministry of Food processing Industries under their umbrella scheme of Kisan Sampada Yojana.
- Similarly under the various schemes for establishing cold chain, green house etc. under the aegis of NHB/NHM, an extra grant is provided to the north eastern states as well as the state of Uttarakhand.

Paramparagat Krishi Vikas Yojana (PKVY)

It is a comprehensive centrally sponsored scheme under National Mission of Sustainable Agriculture (NMSA) to promote organic farming through a cluster approach along with Participatory Guarantee System of Certification (PGS). To promote organic agriculture, there is a need to organize organic cluster demonstrations by institutions like ICAR, SAUs, CAUs, KVKs and other public sector organizations. The programme envisages to:

- Organize/ conduct model organic cluster demonstrations at farmer's field across the country
- Boost/ Promote organic farming among rural youths/ farmers/ consumers/ traders
- Disseminate the latest technologies or organic farming under PKVY
- Utilize the expertise of ICAR/ SAUs/ CAUs/ KVKs and other public sector organizations
- Organize at least one organic cluster demonstration

Mission for Integrated Development of Horticulture (MIDH)

Under MIDH the government provides support for:

- For adoption of organic farming with a unit cost of INR 20,000/ha, 50% of cost limited to INR 10,000/ Ha for a maximum area of 4 Ha is allowed per beneficiary, spread over a period of 3 years. This program is linked with certification.
- Organic Certification Project provides Rs. 5 lakh for a cluster of 50 Ha which will include INR 1.50 lakh in first year, INR 1.50 lakh in second year and INR 2 lakh in third year.
- For vermi-compost units/organic input production, INR 100,000/ unit is provided for permanent structure and INR 16,000/unit for HDPE Vermibed is provided. For permanent structure, 50% of cost conforming to the size of the unit of 30'x8'x2.5' dimension to be administered on pro-rata basis. For HDPE Vermibed, 50% of cost conforming to the size of 96 cft (12'x4'x2') and IS 15907:2010 to be administered on prorata basis.

National Project on Organic Farming (NPOF)

Financial assistance is provided for setting up of organic inputs production units as credit linked back-ended subsidy to the tune of 33% of the total financial outlay restricted to INR 60 lakh for setting up of Fruit and Vegetable Market Waste Compost Units and 25% of the total financial outlay restricted to INR 40 lakh for setting up of Bio-fertilizers or Bio-pesticides production units.

6.6 Assessment of Key Policies

The Key Scheme in the purview of organic farming is the Mission Organic Value Chain Development for North Eastern Region. The government has already disbursed substantial amounts to the nodal agencies for various activities across the value chains including cluster formation, input application, infrastructure development, branding and creating marketing channels, however, the actual impact of the scheme ground is yet to be seen. Most of the states are still at the level 1 of formation of FPCs.

The key challenge which can currently be witnessed in the implementation of the scheme is lack of a sturdy anchor to drive the value chains, which most effectively can be done by a private player, however the grant is limited for usage towards the FPCs. The concept of FPCs/FPOs is not at a very advanced stage in India and we have only

a handful of successful case studies to standby. The lack of proper administration and management to build the correct and efficient market linkages is lacking in the FPOs. The need is for a driving force which can connect the market and the producer, which most effectively can be done by a private sector organic player. However, the Ministry restricts the usage of funds only for the FPOs or government agencies.





7 Business Case for Spices

7.1 Context and Rationale

The trade in the NER is dominated by the traders of Assam, who make little or no distinction between the better quality produce or organic and conventional produce in the market. Further, the undulated topography and frequent natural calamities makes logistics a daunting task to market the produce to distant locations. Since Bangladesh is the closest large market, majority of the trade happens to Bangladesh, the prices are heavily dependent on the country's demand supply scenario (especially for ginger and turmeric).

However, there is significant demand for fresh as well as dried ginger and turmeric to other countries as mentioned in the table below.

Exhibit 68: Major Export Destinations for Processed Ginger, Turmeric & Chili

Commodity	Processed Products	Major Export Destinations
Ginger	Fresh & Dried Ginger	Spain, USA, UK, Netherlands, Morocco, Saudi Arabia, Egypt, Australia, Germany
Turmeric	Fresh and Dried Turmeric	USA, UAE, Iran, UK, Morocco, Malaysia, SriLanka
Chili	Dried	Vietnam, Thailand, Malaysia, USA, Germany

Source: Directorate General of Foreign Trade (DGFT)

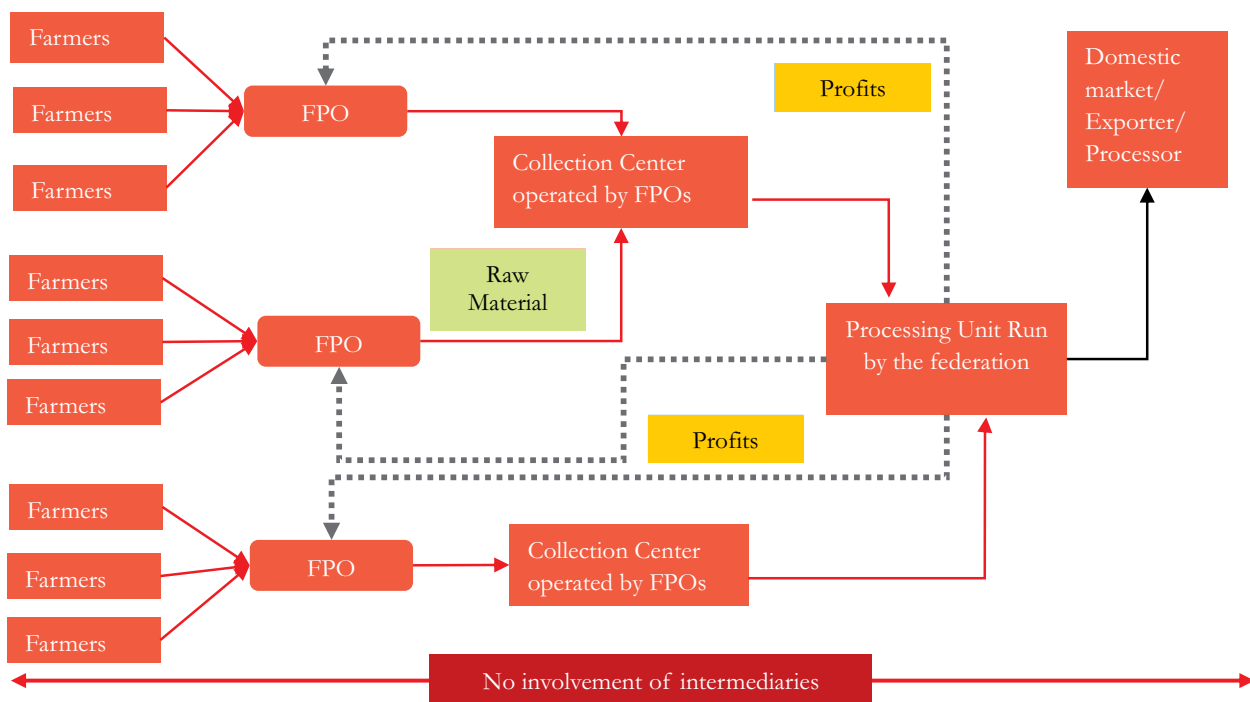
There are a few processing facilities that have been set up by the government/other agencies for value addition of perishables, however these facilities have been operationally unsuccessful due to various reasons including:

- Lack of raw material as input for the processing unit- This is largely due to challenges in aggregating the produce which in turn is a result of small and fragmented land holdings.
- Logistics issues and high transportation cost
- Non-strategic location
- Old/obsolete machinery
- Over capacities
- Poor operations and management

Besides this, the few successful processing units which are operating in the NER have been little successful in actually passing down the value to the farming community. The price realization by the farmers remains the same despite a new marketing avenue and the produce being processed and stored by the processors.

Any processing unit in the NER shall have a far reaching impact on the farmer only when the chain of aggregators is broken and value is added to the produce. The need of the hour is to mobilize the farmers into formal groups, build their capacities to develop business acumen and technical know-how, and set up value addition facilities to reduce perishability and provide an assured price and market to the farmers.

Exhibit 69: Proposed Business Model



Source: YBL Analysis

7.2 Proposed Products

As discussed in the previous chapter, the most feasible options for processing in the NER are Ginger, Turmeric and Chili, as these three crop are produced in substantial quantities, have a marketable surplus and have a good scope for processing, with product demand both from the domestic as well as overseas markets. The products that are being proposed for the facility include:

Exhibit 70: Indicative Capacity for Proposed Business plan

Raw material	Final Product	Proposed Capacity (indicative for 1 state)
Fresh Ginger	Dried Ginger Flakes	2MT/Hr
Fresh Turmeric	Dried Turmeric Flakes	
Semi-Dried Chili (~12% moisture content)	Dried Whole Chili	500 Kg/Hr

Source: YBL Analysis

In the long term the processing units may also evaluate diversification to tertiary products like Ginger Oil, Ginger Oleoresins, Turmeric Oleoresins, Chili flakes etc.

7.3 Mode of Operation and Backward Linkages

To run a processing facility feasibly and more importantly benefit the farmers from value addition, the most feasible option is to set up small processing units in the state, wherein the unit is operated by the Farmer Producer Organizations (FPOs) or federation at the state level- with various FPOs being linked to this federation. This model overcomes the biggest challenge of aggregation as the FPOs in remote locations of the state will collect the produce and bring it to the processing facility.

The shortlisted commodities (ginger, turmeric, chili) are grown in distant districts of Meghalaya, Mizoram and Nagaland. The raw material needs to be collected from these remote locations and brought in to the processing facility which will ideally be located in a well-connected district of the state.

The concept of Farmer Producer Organizations (FPOs) is that farmers, who are the producers of agricultural products, can form groups and register themselves under the Indian Companies Act. The aim is to enhance farmers' competitiveness and increase their advantage in emerging market opportunities. The FPO's major operations include supply of seed, fertilizer and machinery, value addition, market linkages, training and networking and financial and technical advice.

The tentative locations that have been identified for the 3 states include

Exhibit 71: Indicative Location for Establishing Processing Unit

State	Location for processing	Comments
Meghalaya	Ri Bhoi	Located on the Shillong- Guwahati Highway. Ri Bhoi is a major ginger producing cluster in the state. Also, it is in proximity to East Garo Hills which is another major cluster from where ginger can be procured. Ri Bhoi also home to Ginger Development Station
Mizoram	Bairabi	Upcoming Railway station. Also a major ginger/ turmeric cluster. One processing unit already exists in Aizawl
Nagaland	Dimapur	Commercial center for Nagaland. Well connected to the production clusters of ginger and turmeric

Source: YBL Analysis

The respective processing facilities will be supported by collection centers in the key clusters of the states. Some of the identified production clusters include:

Exhibit 72: Potential Clusters for Raw Material Sourcing

Mizoram	Key Production Clusters
Ginger	Khanpui, Kepran, , Pehlawn, Serchhip, Lungdai, Kawnpui, Kolasib, Ngopa, Kawrthah, Mamit, South Chawngtui, Thingsai, Thingkah, Tuipang, Theiri, Theiva, Maubawk L, Maubawk CH, Siata
Turmeric	Reiek, Rulpuihlum, Ailawng, Lungphun, West Phaileng, Lawngtlai, Mampui, Saitual, Seling, Darlawn, Saipum, Kawnpui, Tlangpui, Tlabung, Lawngtlai, Mampui, Kawlchaw East, Tuisumpui, Khopai
Chili	Sakawrdai, Zohmun, Vanbawng, Khanpui, East Lungdar, North Vanlaiphai, Rullam, Serkhan, Saipum, West Phaileng, Khawhnai, Marpara, Reiek, Mampui, Bungtlang South, Diltlang, Zawngling, Niawhtlang, Chhualung, Siata

Meghalaya	Key Production Clusters
Ginger	Umsning, Umroi, Byrnihat, Nongpoh in Ri Bhoi district
Turmeric	Khliehriat in East Jaintia Hills, Laskei, Shangpung and Thalaskin in West Jaintia Hills.

Nagaland	Key Production Clusters
Ginger	Phek, Mokokchung and Tuensang
Chili	Peren, Dimapur, Mokokchung and Tuensang

Source: YBL Analysis

7.4 Proposed Facilities at Collection Centres

In order to maintain a steady flow of produce to the proposed spices producing facility, it is proposed to set up intermittent collection centers at strategic locations to procure, monitor, account for and facilitate onward dispatch thereby leading to smooth running operations. The produce will be brought in by the farmers and will undergo primary cleaning (by farmers themselves), packaged in quality biodegradable gunny bags, tagged, documented and dispatched to processing facility.

The proposed collection centres at strategic locations will thus be the consolidation point for nearby clusters. The indicative infrastructure at the Collection Centre would include:

- Weighing Scale and ancillary equipment: The weighing scale equipment (electronic) would help in measuring quantum of produce coming in at the collection centre.
- Bar Coding Machines: The produce procured from designated FPO cluster would be packed, tagged and documented with a unique identification system (Bar code/UID). This would be read by the bar coding machine and transferred electronically so as to maintain clear records of all incoming and outgoing packages. This would also help to ensure traceability and quality of the produce as well.
- IT Equipment: For efficient electronic documentation, a computer facility with power backup at the collection centre is essential. This would help in maintaining the database, billing, dispatch of produce and usage of manpower at the collection centre. Internet connectivity will enable smooth and timely communication
- Vans/LMV: For transportation of packaged and documented produce to processing facility

- Miscellaneous: Stock of biodegradable gunny bags (packaging material), relevant stationery and documents, table/chair etc.

7.5 Procurement Details

The overall production of identified commodities, the marketable surplus and the targeted procurement from the states of Meghalaya, Mizoram and Nagaland is provided in the table below. The marketable surplus has been derived basis the primary discussions with stakeholders in the respective states. The procurement target in the initial years is limited to 5% of the surplus available, while it can be gradually enhanced to upto 10% in the long term. 5% procurement target is achievable given the role of FPOs in the proposed business model.

Meghalaya

Exhibit 73: Estimation of Marketable Surplus and Procurement Target of Identified Commodities in Meghalaya

Commodity	Production	Marketable Surplus		Procurement 5% (after considering 5% loss)	Procurement 10% (after considering 5% loss)
	Quantity (MT)	% Available	Quantity (MT)	Quantity (MT)	Quantity (MT)
Ginger	65,000	85%	55300	2,624	5,249
Turmeric	16,000	85%	13600	646	1,292

Source: YBL Analysis

Mizoram

Exhibit 74: Estimation of Marketable Surplus and Procurement Target of Identified Commodities in Mizoram

Commodity	Production	Marketable Surplus		Procurement 5% (after considering 5% loss)	Procurement 10% (after considering 5% loss)
	Quantity (MT)	% Available	Quantity (MT)	Quantity (MT)	Quantity (MT)
Ginger	32,000	90%	28,500	1,426	2,851
Turmeric	28,000	90%	25,200	1,260	2,520
Chili	9,000	70%	6,300	315	630

Source: YBL Analysis

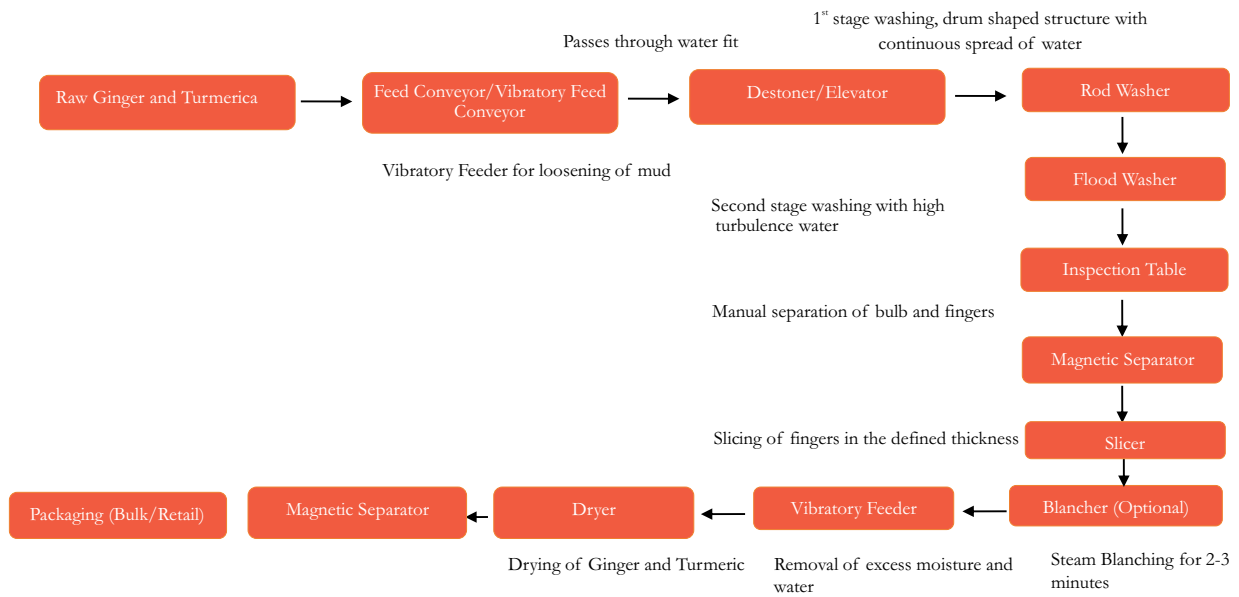
Nagaland

Exhibit 75: Estimation of Marketable Surplus and Procurement Target of Identified Commodities in Nagaland

Commodity	Production	Marketable Surplus		Procurement 5% (after considering 5% loss)	Procurement 10% (after considering 5% loss)
	Quantity (MT)	% Available	Quantity (MT)	Quantity (MT)	Quantity (MT)
Ginger	44,000	85%	37,100	1,853	3,706
Turmeric	4,000	85%	3,400	170	340
Chili	11,000	90%	9,900	495	990

Source: YBL Analysis

7.6 Ginger & Turmeric Processing Details



Source: Discussion with T&I Global Limited

Exhibit 76: 1st Stage Vibratory Fluidized Bed Drier – Ginger/Turmeric Processing (Illustrative)



Source: T&I Global Limited

Exhibit 77: Centrifugal Fan with Steam Radiator – Ginger/Turmeric Processing



Source: T&I Global Limited

7.7 Chili Processing Details

Moisture Content @ 12%. These are sun dried by the farmers

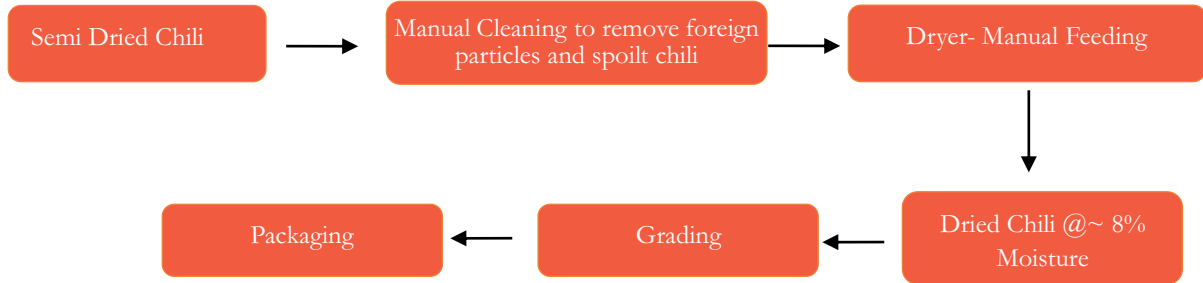


Exhibit 78: Chili Drier (Illustrative)



Source: T&I Global Limited



8 Proposed Indicative Project Financials

The financials provided in this chapter are indicative and the capacities have been derived basis marketable surplus and a procurement target of around 5%. Specifics of business plan will have to be worked out basis the exact location of the unit being established. The number showcased below are for one processing plant and similar models can be replicated across the three states- Mizoram, Nagaland and Meghalaya, with modifications in dynamics related to procurement pricing, transportation etc. In the current scenario, the model is best suited to the dynamics of Mizoram and Nagaland, as the procurement prices are currently very low. In Meghalaya, due to its proximity to Guwahati, the prices are comparatively higher, hence the model dynamics would change accordingly. In case of chilies, since a large variety is available in varying price ranges, Mizo chili has been considered for calculating the financials.

8.1 Operations, Cost and Revenue Assumptions

Particular	Unit	Value
No. of Operational Days- Ginger/Turmeric	Days	220
No. of Operational Days- Chili	Days	115
Capacity- Ginger/Turmeric Line	Kg/Hr	2000
Capacity- Chili	Kg/Hr	500
Capacity- Cold Storage		1000
No. of Shifts	No.	1
Hours per shift	Hours	8
Maximum Capacity of Ginger/Turmeric Line	Kg/annum	
Maximum Capacity of the Chili Dryer	Kg/annum	

Particular	Unit	Comments
Ginger / Turmeric Line: Capacity Utilization- Yr 1	%	30
Capacity Utilization- Yr 2	%	50
Capacity Utilization- Yr 3	%	60
Capacity Utilization- Yr 4 onwards	%	70
Chili Dryer: Capacity Utilization- Yr 1	%	30
Capacity Utilization- Yr 2	%	40
Capacity Utilization- Yr 3	%	50
Capacity Utilization- Yr 4 onwards	%	60
Processing Mix for Ginger-Turmeric Line		
Ginger	%	70
Turmeric	%	30
Procurement Cost		
Ginger	INR/Kg	13
Turmeric	INR/Kg	11
Semi Dried Whole Chili	INR/Kg	225
Processed Product		
Ginger Flakes		
Turmeric Flakes		
Whole Dried Chili		
Price Realization		
Ginger Flakes	INR/Kg	260
Turmeric Flakes	INR/Kg	190
Whole Dried Chili	INR/Kg	290
Conversion		
Ginger- Washing / Sorting/Grading	%	95
Ginger Flakes from Graded/Sorted Produce	%	14.3
Turmeric- Washing / Sorting/Grading	%	95
Turmeric Flakes from Graded/Sorted Produce	%	16.67
Chili- Sorting/Grading/Drying	%	90
No of Days Receivables	Days (On net sales)	30
No of Days Inventory		
Raw Material	(on Raw Material Cost)	30
Finished Products	(on Net Sales)	30
Packing Material	(on Packaging Costs)	15
No of Days Payable	(on Raw Material Cost)	7

8.2 Project Cost

	Particulars	Amount (INR Lacs)
I	Land	100
II	Land Development	60
III	Civil Works at Site	682
IV	Plant and Machinery at Site	523
VI	Miscellaneous	111
VII	Furniture and Fittings	20
VIII	Pre-operative Expenses	25
	TOTAL PROJECT COST (Before Contingency and Capitalised Interest)	1,521
	Contingency	70
	TOTAL PROJECT COST (Before Capitalised Interest)	1,591
	Capitalised Interest	8
	TOTAL PROJECT COST (Excluding Working Capital)	1,599
	Margin for Working Capital	38
	TOTAL PROJECT COST	1,637

8.3 Project Cost Details

Particulars	Specs	Qty	Rate (INR)	Amount (INR Lacs)	
I	Civil Works at Site				
1	Area for Ginger/Turmeric	Sqft	15,000	2,420	363
2	Area for Chillies	Sqft	2,000	2,420	48
3	Utility Area	Sqft	2,000	2,420	48
4	Lab Area	Sqft	200	2,420	5
5	Administration Area	Sqft	1,000	2,420	24
6	Storage Area	Sqft	8,000	2,420	194
	Total				682
II	Plant and Machinery at Site				
1	Ginger and Turmeric Processing Integrated Lines	2 MT/hr	1	3,81,07,292	381
2	Chillies Processing	0.5 MT/hr	1	31,24,500	31
3	Magnetic Separators	1 in No	1	10,46,400	10
4	Cold Store Panelling and Machinery		1000 MT	1	1,00,00,000
	Plant and Machinery at Site				523
III	Miscellaneous				
1	Bar Coding Machines	10 no.	100	10,000	10
2	Computers and IT related	Lumpsum	1	20,00,000	20
3	Tables for Grading/Sorting, Scales etc.	Lumpsum	1	10,00,000	10
4	DG Set	250 kva	2	9,00,000	18
5	WTP	25000 LPD	1	3,00,000	3

Particulars		Specs	Qty	Rate (INR)	Amount (INR Lacs)
6	Other Miscellaneous	Lumpsum	1	50,00,000	50
	Total				111
IV	Furniture and Fittings		1	20,00,000	20
V	Pre-operative Expenses		1	25,00,000	25

8.4 Means of Finance

Means of Finance	Specs	Amount (in INR Lac)
Equity/ Grant Financing	90%	1,473
Debt Financing	10%	164
Total	100%	1,637

The exact means of finance would be worked out basis each specific project. Given the capital intensive nature of the project, and the envisaged implementation under FPOs, it is recommended that a larger portion be financed through grant to reduce the burden on the FPOs. This would enable passing back of profits from the venture to the farmers.

8.5 Terms of debt and repayment

Interest Rate on Term Loan	10.0%
Moratorium	1.0 Yr
Moratorium in Quarters	4
Repayment	5 Yr
No of Quarterly Instalments	20



8.6 Income statement

All figures in INR lacs (unless specified)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues	740	1,164	1,494	1,854	1,947	2,044	2,146	2,254	2,366	2,485
Raw Material Cost										
Ginger	98	172	217	265	279	293	307	323	339	356
Turmeric	36	62	79	96	101	106	111	117	123	129
Semi Dried Whole Chillies	324	454	595	750	788	827	868	912	957	1,005
Inward Logistics	12	21	26	33	34	36	38	40	41	44
Total Raw Material Cost	470	709	917	1,144	1,202	1,262	1,325	1,391	1,461	1,534
Manpower	80	91	111	116	122	128	134	141	148	156
Processing	28	49	61	75	79	83	87	92	96	101
Packaging	3	4	5	6	7	7	7	8	8	8
Total Cost (Ex-Factory Gate)	581	853	1,094	1,342	1,409	1,480	1,554	1,631	1,713	1,799
Cold Storage Operations	9	9	10	10	11	11	12	13	13	14
Collection Centre Costs	5	5	5	6	6	6	6	7	7	7
Sales and Marketing Costs	15	20	19	19	19	20	21	23	24	25
Outward Logistics	-	-	-	-	-	-	-	-	-	-
Other Overheads	12	13	13	14	15	15	16	17	18	19
Total Fixed Cost	41	47	47	48	51	53	56	59	62	65
EBITDA	118	263	353	463	487	511	537	563	592	621
EBITDA Margin	16.0%	22.6%	23.6%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Depreciation	101	101	101	101	101	101	101	101	101	101
Interest on Term Loan	15	12	9	5	2	-	-	-	-	-
Interest on Working Capital Loan	12	16	22	28	32	33	35	37	39	41
Total Interest and Depreciation	129	129	132	134	135	135	136	138	140	142
Pre-Operative Expenses Write-off	25	-	-	-	-	-	-	-	-	-
PBT	(36)	134	221	329	352	376	400	425	452	479
Tax	-	44	73	109	116	124	132	140	149	158
PAT	(36)	90	148	220	236	252	268	285	303	321
Net Income Margin	-4.8%	7.7%	9.9%	11.9%	12.1%	12.3%	12.5%	12.6%	12.8%	12.9%

8.7 Balance Sheet

All figures in INR lacs (unless specified)

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Cash and Bank	38	30	38	45	49	52	54	57	60	63	66
Receivables		61	96	123	152	160	168	176	185	194	204
Inventory		100	154	198	247	259	272	286	300	315	331
Balance of Pre-Operative Expenses	25	-	-	-	-	-	-	-	-	-	-
Total Current Assets	63	191	288	366	448	471	494	519	545	572	601
Land	163	163	163	163	163	163	163	163	163	163	163
Building	720	677	634	591	548	504	461	418	375	331	288
Plant and Equipment	669	613	558	502	446	390	335	279	223	167	112
Furniture and Fittings	21	19	17	15	13	11	8	6	4	2	-
Total Fixed Assets	1,574	1,473	1,372	1,270	1,169	1,068	967	866	765	664	563
Total Assets	1,637	1,663	1,660	1,636	1,618	1,539	1,461	1,385	1,310	1,236	1,163
Liabilities and Shareholders' Equity											
Payables	-	9	14	18	22	23	24	25	27	28	29
Working Capital Loan	-	114	177	228	283	297	312	327	344	361	379
Long Term Loan	164	131	98	65	33	-	-	-	-	-	-
Total Liabilities	164	253	289	311	338	320	336	353	370	389	408
Capital	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473	1,473
Reserves		(63)	(102)	(147)	(193)	(254)	(348)	(441)	(534)	(626)	(718)
Additional Funding Required		-	-	-	-	-	-	-	-	-	-
Shareholders' Equity	1,473	1,410	1,371	1,326	1,280	1,219	1,125	1,032	939	847	755
Total Liabilities and Shareholders' Equity	1,637	1,663	1,660	1,636	1,618	1,539	1,461	1,385	1,310	1,236	1,163

8.8 Statement of Cash Flows

All figures in INR lacs (unless specified)

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net Income		(36)	90	148	220	236	252	268	285	303	321
Add: Depreciation		101	101	101	101	101	101	101	101	101	101
Add: Write-off of Pre-Operative Expenses		25	-	-	-	-	-	-	-	-	-
Less: Increase in Receivables		(61)	(35)	(27)	(30)	(8)	(8)	(8)	(9)	(9)	(10)
Less: Increase in Inventory		(100)	(54)	(44)	(48)	(12)	(13)	(14)	(14)	(15)	(16)
Add: Increase in Payables		9	5	4	4	1	1	1	1	1	1
Cash from Operating Activities		(61)	106	181	248	318	333	349	364	381	398
Investments	(1599)										
Cash from Investing Activities	(1599)										
Increase/ (Decrease) in Term Loans	164	(33)	(33)	(33)	(33)	(33)	-	-	-	-	-
Increase/ (Decrease) in Working Capital Loan	-	114	64	51	55	14	15	16	16	17	18
Increase/ (Decrease) in Equity Contribution	1,473	-	-	-	-	-	-	-	-	-	-
Additional Funding Required	-	-	-	-	-	-	-	-	-	-	-
Possible Pay-outs to Equity	-	(27)	(129)	(193)	(266)	(297)	(346)	(361)	(378)	(395)	(413)
Cash from Financing Activities	1,637	53	(99)	(175)	(244)	(315)	(331)	(346)	(361)	(378)	(395)
Total Cash Flow	38	(7)	8	7	4	2	3	3	3	3	3
Opening Balance	-	38	30	38	45	49	52	54	57	60	63
Closing Balance	38	30	38	45	49	52	54	57	60	63	66

8.9 Key Ratios

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Profitability Ratios										
EBITDA Margin	16.0%	22.6%	23.6%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
PBT Margin	-4.8%	11.6%	14.8%	17.7%	18.1%	18.4%	18.7%	18.9%	19.1%	19.3%
Net Income Margin	-4.8%	7.7%	9.9%	11.9%	12.1%	12.3%	12.5%	12.6%	12.8%	12.9%
Return on Assets (ROA)	-2.2%	5.4%	9.0%	13.5%	14.9%	16.8%	18.8%	21.2%	23.8%	26.8%
Return on Capital Employees (ROCE)	-0.8%	6.6%	10.3%	15.1%	16.6%	18.6%	20.9%	23.4%	26.4%	29.8%
Return on Equity (ROE)	-2.5%	6.5%	11.0%	16.9%	18.9%	21.5%	24.9%	28.9%	33.9%	40.1%

8.10 Key Matrix

All figures in INR lacs (unless specified)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Debt Service Coverage Ratio (DSCR)										
Net Income	(36)	90	148	220	236	252	268	285	303	321
Add: Term Loan Interest Payment	15	12	9	5	2	-	-	-	-	-
Add: Depreciation	101	101	101	101	101	101	101	101	101	101
Add: Pre-operative Expenses Write-off	25	-	-	-	-	-	-	-	-	-
Cash Profit	106	203	257	327	339	353	369	386	404	422
Term Loan Principal Payment	33	33	33	33	33	-	-	-	-	-
Term Loan Interest Payment	15	12	9	5	2	-	-	-	-	-
Term Loan - Principal and Interest Payment	48	45	41	38	35	-	-	-	-	-
DSCR	2.21	4.55	6.23	8.59	9.74	NA	NA	NA	NA	NA
Average DSCR	5.96									
Net Income	(36)	90	148	220	236	252	268	285	303	321
Add: Depreciation	101	101	101	101	101	101	101	101	101	101
Add: Interest (1-Tax)	10	8	6	4	1	-	-	-	-	-
Less: Increase in Working Capital	(151)	(85)	(67)	(74)	(19)	(20)	(21)	(22)	(23)	(24)
Less: Capital Investments	-	-	-	-	-	-	-	-	-	-
Net Cash Flow to Firm	(76)	114	187	251	319	333	349	364	381	398
Residual Value										
Cash flow for IRR Calculation	(76)	114	187	251	319	333	349	364	381	398
Project IRR	13.09%									

8.11 Small Processing Units

Besides the Business plan provided in the segment above, another business plan has been worked out for a smaller processing unit. These units are proposed to be set up by small local entrepreneurs who work on smaller catchment area. The produce considered for this plan includes ginger, turmeric and chili. A snapshot of the indicative business plan is provided below:

Particulars	Unit	Assumption
No. of Operational Days- Ginger/Turmeric	Days	225
No. of Operational Days- Chili	Days	120
Capacity- Ginger/Turmeric Line	Kg/Hr	150
Capacity- Chili	Kg/Hr	100
Capacity- Cold Storage	MT	100
No. of Shifts	No.	1
Hours per shift	Hours	8
Ginger / Turmeric Line: Capacity Utilization- Yr 1	%	30
Capacity Utilization- Yr 2	%	50
Capacity Utilization- Yr 3	%	65
Capacity Utilization- Yr 4 onwards	%	80
Chili Dryer: Capacity Utilization- Yr 1	%	30
Capacity Utilization- Yr 2	%	40
Capacity Utilization- Yr 3	%	50
Capacity Utilization- Yr 4 onwards	%	70
Processing Mix for Ginger-Turmeric Line		
Ginger	%	70
Turmeric	%	30
Procurement Cost		
Ginger	INR/Kg	13
Turmeric	INR/Kg	11
Semi Dried Whole Chili	INR/Kg	225
Processed Product		
Ginger Flakes		
Turmeric Flakes		
Whole Dried Chili		
Price Realization		
Ginger Flakes	INR/Kg	260
Turmeric Flakes	INR/Kg	190
Whole Dried Chili	INR/Kg	290

8.12 Project Cost

The indicative project cost for a small processing unit with ginger and turmeric processing (dried flakes) and a chili drying line along with a small cold storage of 100 MT comes to around INR 1.8 Cr. The detailed breakup is provided below

	Particulars	Amount (INR Lacs)
I	Land	15
II	Land Development	9
III	Civil Works at Site	73
IV	Plant and Machinery at Site	55
VI	Miscellaneous	5
VII	Furniture and Fittings	2
VIII	Pre-operative Expenses	10
	TOTAL PROJECT COST (Before Contingency and Capitalised Interest)	168
	Contingency	7
	TOTAL PROJECT COST (Before Capitalised Interest)	175
	Capitalised Interest	1
	TOTAL PROJECT COST (Excluding Working Capital)	176
	Margin for Working Capital	5
	TOTAL PROJECT COST	181

Such units usually run on low margins and try to sustain their business by maintaining low procurement and operational costs. Such units may not be able to pay a premium to the farmers in the short run, but definitely opens up a new marketing avenue for them. Also, if many such units come up in a cluster, then the competition for procuring the limited raw material available leads to price stabilizations at a higher amount for the farmer.

8.13 Challenges for the Project

- Farmers of the region are not very enterprising and to move them out of a conventional practice or implementing a new practice is not very easy
- The trade which is currently dominated by traders from Assam is difficult to break. This is largely due to the following reasons
 - Long term relationship with the traders
 - Advance payment provided by the traders in some cases
 - Trust factor on the traders. Any new person will take time to gain trust within the community
 - The same trader buys a number of commodities from the village. Thus it is a stop market for the farmers.
- In case of organic produce, the on ground implementation of organic certification is a major challenge. Though the intrinsic properties of spices from North east is commendable and the produce is already chemical free, the certification at the ground level is yet to accelerate.

8.14 Branding and Promotion

Branding is of prime importance to differentiate one's product from other, ensure customer loyalty and sustenance in the competitive market. Powerful brands appeal new customers, fetches high premium and paves market base for future products. Branding ensures high market share, sustainable profits and a key to long term security. Branding should reflect the customer need and should be apparent through distinctive packaging, logo and positioning statement.

There are different ways to establish a strong brand in the market some of which are discussed below:

- **Positioning Statement:** NER needs to leverage the advantage of growing natural, fresh and sustainable produce through a strong positioning statement. A powerful positioning statement reflecting the status for its products needs to be devised. An indicative list of the positioning statement is:
 - o From the Organic region
 - o Sustainably Grown
 - o From the Nature's Lap
- **Promotion in Trade Fairs for B2B Marketing:** Participation in national and international trade fairs provide the much needed visibility among the potential buyers. This helps to showcase the products and helps to understand the need of the customers. A list of major national and international trade organic fairs are enlisted below:

Exhibit 79: Indicative List of Major National and International Organic Trade Fairs

National	International
Biofach India	Biofach Germany
Aahar	Anuga (Germany)
Food Ingredients India	Food Ingredients Asia, Europe
Agro Tech	SIAL (Paris)
Annapoorna: World of Food	AGRINEXT (France)
International Food Tech India	Middle East Natural and Organic Product Expo
India FODEX	China International Import And Export Food & Beverage Exhibition
	Cosmo Food Vicenza (Italy)

Source: Internal databank/ visits

- Logo: An appealing logo reflecting the core competency of NER needs to be designed, with all products including spices showcased under its umbrella.
- Packaging: An attractive packaging highlighting the requisite information needs to be designed as per domestic and international market requirements.
- Promotion of NER products in the government meetings and seminars
- Promotion through billboards/visibility campaigns at all major gateway airports in the region. The same campaign should be implemented at Mumbai, Delhi, Hyderabad, Bangalore, Chennai and Kolkata Airports as well.

MOUs with importers from key target markets

The product portfolio proposed for the processing facility has high export potential as highlighted in the preceding sections. It is critical to enter into agreements/MOUs with exporters from India or importers in key target markets to ensure consistent off take of the quantum of production and cater to the global demand. An indicative list of major organic importers is provided in the Annexure.

Social Media Outreach

Also, the power and outreach of social media cannot be underestimated. Today, the youth comprises a majority of the social media platform users online. This segment has a higher sense of health awareness and overall wellness and hence need to be targeted through dedicated pages and online programs on Facebook, Twitter and other applicable platforms.



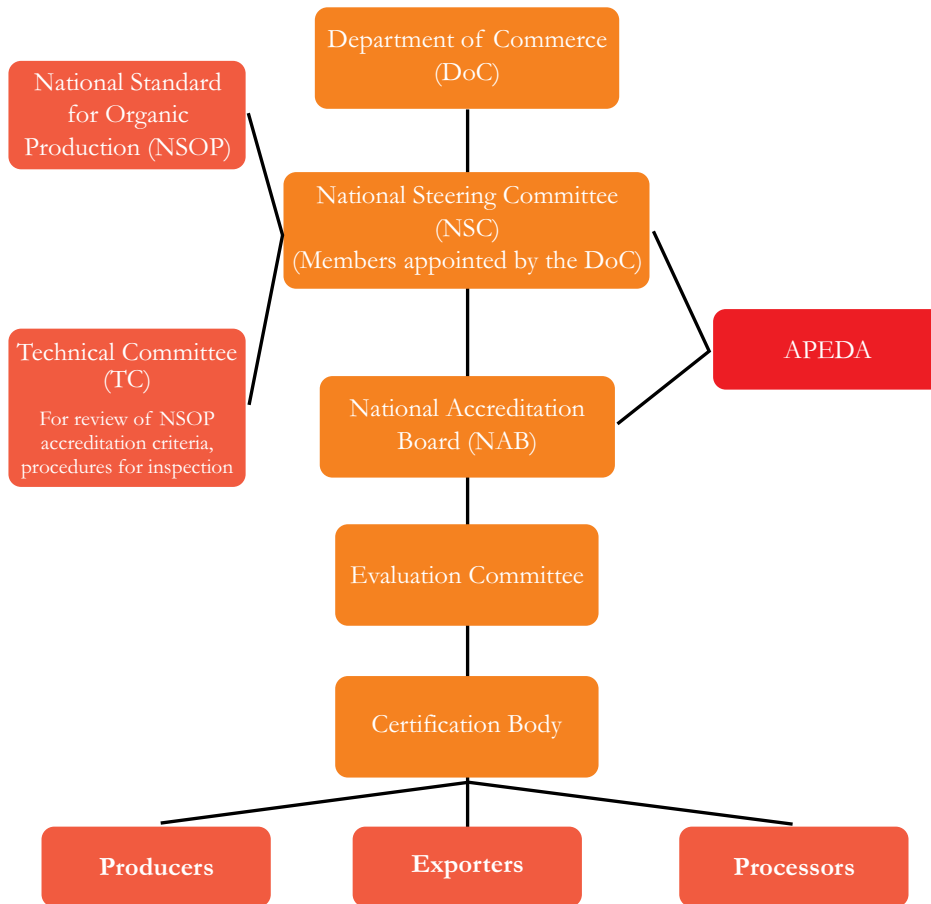
9 Organic Policy, Standards and Regulations in India

9.1 National Programme for Organic Production

India launched National Programme for Organic Production (NPOP) in the year 2000, and this was notified from 1st October 2001 under the Foreign Trade Development Regulations (FTDR) Act. The National Programme for Organic Production (NPOP) proposes to provide an institutional mechanism for the implementation of National Standards for Organic Production (NSOP). With the launch of NPOP the exports of organic products from India has grown from INR 62 crores (2002-03) to ~INR 2,100 crores (USD 327 million) in 2014-15. The scope of NPOP includes:

- a. To provide the means of evaluation of certification programme for organic agriculture and products (including wild harvest, aquaculture, livestock products) as per the approved criteria.
- b. To accredit certification programmes of Certification Bodies seeking accreditation.
- c. To facilitate certification of organic products in conformity with the prescribed standards.
- d. To facilitate certification of organic products in conformity with the importing countries organic standards as per equivalence agreement between the two countries or as per importing country requirements.
- e. To encourage the development of organic farming and organic processing.

Exhibit 80: Operational Structure of NPOP and its Major Stakeholders



The scope of organic certification exists for the following categories:

- Crop Production
- Wild Harvest Collection
- Livestock
- Apiculture
- Aquaculture
- Food Processing

The standards and procedures have been formulated in harmony with international standards such as those of Codex and IFOAM. NPOP is implemented under AGMARK by Ministry of Agriculture for the domestic market (voluntary). The NPOP standards for production and accreditation system have been recognized by European Commission*and Switzerland* as equivalent to their country standards. USDA has recognized NPOP conformity assessment procedures of accreditation as equivalent to that of US. With these recognitions, Indian organic products duly certified by the accredited certification bodies of India are accepted by the importing countries.

9.2 Indian Organic Certification Mark

A trademark – “India Organic” will be granted on the basis of compliance with the National Standards for Organic Production (NSOP). Communicating the genuineness as well as the origin of the product, this trademark will be owned by the Government of India. Only such exporters, manufacturers and processors whose products are duly certified by the accredited Certification Bodies, will be granted the license to use of the logo which would be governed by a set of regulations.



9.3 PGS - India

In order to promote domestic organic market growth and also to enable small and marginal farmer to have easy access to organic certification, a decentralized organic farming certification system called Participatory Guarantee System –India (PGS-India) is implemented by the Department of Agriculture and Cooperation, Ministry of Agriculture and Farmers Welfare, Government of India. It is cost effective, farmer- friendly and hassle-free. It is outside the framework of third party system of certification, which is a pre-requisite to enter export market of organic produce.



PGS India system is based on participatory approach, a shared vision, transparency and trust. In addition it gives PGS movement a National recognition and institutional structure. Participation is an essential and dynamic part of PGS and it embodies the principle of collective responsibility for ensuring the organic integrity of the PGS.

All the key stakeholders (producers, facilitating agencies, NGOs, social organizations, State Governments and state agencies) support the guiding principles and goals, PGS is striving to achieve and this is achieved initially through their participation and support in the design and then by joining it. This may include commitment in writing through signing an application and pledge that includes the vision.

Transparency is created by having all stakeholders, including producers and consumers, aware of exactly how the guarantee system works to include the standards, the organic guarantee process (norms) with clearly defined and documented systems and how decisions are made.

PGS India while keeping the spirit of PGS intact aims to give the entire movement an institutional structure. This is achieved by networking the groups under common umbrella through various facilitating agencies, Regional Councils and Zonal Councils. National Centre of Organic Farming shall be the custodian of data, define policies and guidelines and undertake surveillance through field monitoring and product testing for residues. Regional councils and facilitating agencies facilitate the groups in capacity building, training, knowledge/ technology dissemination and data uploading.

9.4 Unified Regulation for Organic Food

The latest development in the organic regulation has been the introduction of a unified regulation on “Organic Foods”. As a symbol of authenticity and trust, a common logo for “Organic Foods” has also been introduced. Moreover a portal has also been developed (named The Indian Organic Integrity Database Portal), through which the consumers can access all information with respect to the producer, the certification system and the availability of certified organic products.



The Food Safety and Standards (Organic Foods) Regulations 2017 covers under its ambit two existing systems of Organic certification –National Programme for Organic Production (NPOP) of APEDA, Department of Commerce and Participatory Guarantee System for India (PGS-India) of Ministry of Agriculture and Farmers Welfare. The regulation also provides for recognition of other certification systems in the future.

Under the Food Safety and Standards (Organic Foods) Regulations, 2017, any food offered or promoted for sale as Organic Foods are required to comply with all the requirements of NPOP or PGS-India or any other certification system that may be approved by FSSAI in future. However, direct sales of organic food by small farmers, producer or producer organization to the end-consumer is exempt from this requirement. All organic foods under the regulation have to comply with other Regulations of FSSAI as applicable. Currently, both systems in operation have separate logos, which would be integrated into a single unified logo for organic food in due course. The unified logo is an identity mark to distinguish organic products from non-organic ones, supported with the tagline “Jaivik Bharat” at the bottom, for easy identification of Organic Food from India.

9.5 Organic Certification Standards in major importing nations

USDA organic

The Agricultural Marketing Service of the U.S. Department of Agriculture (USDA) oversees the National Organic Program (NOP). The NOP regulations include a definition of “organic” and provide for certification that agricultural ingredients have been produced under conditions that would meet the definition. The National Organic Program (NOP) is a regulatory program housed within the USDA Agricultural Marketing Service. It is also responsible for developing national standards for organically-produced agricultural products. These standards assure consumers that products with the USDA organic seal meet consistent, uniform standards. The regulations do not address food safety or nutrition.

Key Activities

- Maintain the list of certified organic operation and help new farmers and business learn how to get certified
- Develop regulations and guidance on organic standards
- Manage the National List of Allowed and Prohibited Substances
- Accredite certifying agents to certify organic producers & handlers
- Establish international organic import and export policies
- Investigate and take action on regulatory violation complaints
- Facilitate the work of the National Organic Standards Board, a Federal Advisory Committee
- Oversee the Organic Certification Cost Share programs to support certified organic operators
- Provide training to certifying agents, USDA staff, & other stakeholders
- Engage and serve the organic community

The United States has a recognition agreement with India. Recognition agreements allow a foreign government to accredit certifying agents in that country to the USDA organic standards. These foreign certifying agents are authorized to certify organic farms and processing facilities, ensuring that USDA organic products meet or exceed all USDA organic standards. These products can then imported for sale in the United States. This agreement covers all USDA organic products produced in India and certified by an Indian government-accredited certifying agent.

EU Organic

In 2007 the European Council of Agricultural Ministers agreed on a new Council Regulation setting out the principles, aims and overarching rules of organic production and defining how organic products were to be labelled. The regulation set a new course for developing organic farming further, with the following aims:

- Sustainable cultivation systems
- A variety of high-quality products.
- Greater emphasis on environmental protection
- More attention to biodiversity
- Higher standards of animal protection
- Consumer confidence
- Protecting consumer interests.



Foods may be labelled “organic” only if at least 95% of their agricultural ingredients meet the necessary standards. In non-organic foods, any ingredients which meet organic standards can be listed as organic. Organic production outlaws the use of genetically modified organisms and derived products. However, the regulation on genetically modified food and feed lays down a threshold (0.9%) under which a product’s GMO content does not have to be indicated. Products with GMO content below this threshold can be labelled organic.

To sale organic products produced in non EU countries, the organic products have to adhere to the standards equivalent or identical to that of EU organic producers. Certifying organizations in the non EU countries are authorized and monitored by the European Commission and EU countries.

Recognition of the European Union by India

India is recognized for the purpose of equivalence since 29 June 2006 for an unspecified duration.

1. Product categories:

- a) Unprocessed crop and vegetative propagating material and seeds for cultivation;
- b) Processed agricultural products for use as food composed essentially of one or more ingredients of plant origin.

2. Origin: products of category 1(a) and organically grown ingredients in products of category 1(b) that have been grown in India.

3. Production standards: National Programme for Organic Production (NPOP)

JAS (Japanese Agricultural Standard)

The JAS Standards for organic plants and organic processed foods of plant origin were established in 2000 on the basis with the Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods which were adopted by the Codex Alimentarius Commission.



The organic JAS system has been further developed with the addition of the JAS Standards for organic livestock products, organic processed foods of animal origin and organic feeds which took effect in November 2005.

Operators certified by registered Japanese or overseas certifying bodies are able to attach the organic JAS logo to products that were produced or manufactured in accordance with relevant organic JAS Standards.



10 Sustainable Package of Practices

This section captures the sustainable package of practices for organic produce in the North Eastern Region

10.1 Biodiversity Management

Currently different types of cropping systems are followed for ginger, turmeric and chili cultivation in the NER. Generally farmers prefer mono cropping of ginger and turmeric and mixed cropping for chili. However, they also practice mixed cropping for ginger and turmeric with maize, chili, brinjal, papaya, cucumber, pumpkin, yam, tree tomato, tapioca and different types of leguminous crops in Jhum. Sometimes they intercrop ginger with maize and pineapple.

Mixed cropping of ginger and turmeric with different types of vegetable crops, besides supporting a wide range of beneficial insects and soil micro-organisms, also helps in soil and water conservation, improves soil fertility and generates better income for farmers. Rather than mono-cropping, intercropping or mixed cropping of ginger, turmeric and chili in the hill areas of northeast India facilitates conservation and management of crop biodiversity. The most common types of crops grown along with ginger in NER are both annuals and perennials, which include chili, brinjal, pumpkin, cucumber, papaya, maize, pineapple, banana, winter squash, pigeon pea, castor, tapioca, kidney bean etc.

10.2 Maintenance of buffer zone for organic cultivation

In order to cultivate crops organically, a buffer zone of 5–10 meters should be left all around to separate the plot from conventional farms. The produce from this buffer zone should not be treated as organic. For an annual crop, the conversion period required will be minimum two years. Ginger turmeric and chili can be cultivated organically as an intercrop or mixed crop provided all the other crops are grown following organic methods. It is desirable to include a leguminous crop in rotation with ginger and turmeric. Ginger-banana-legume or turmeric-vegetable legume combinations are recommended as good cropping patterns.

10.3 Traditional varieties and their importance

In case of ginger traditional varieties are more pungent and hence have a better market than other varieties. Since the majority of the population in the hilly areas of the northeastern region is non-vegetarian, ginger finds itself used in different culinary preparations. The farmers mostly prefer local varieties as these have less chance of being infected by pests and disease, and can be stored for a longer period. Similar is the case with chili and turmeric.

10.4 Seed Selection

Carefully preserved seed rhizomes, free from pests and disease, collected from organically cultivated farms should be used for planting in case of ginger and turmeric. However, to begin with, seed material from high yielding local varieties may be used in the absence of organically produced material. Seed rhizomes should not be treated with any chemicals. The seed quantity required varies from region to region and with the method of cultivation adopted. However, the average is 1500– 2500 kg per ha. The weight of the seed rhizomes is approx. 25–30 gm. and 4–5 cm length in size.

10.5 Treatment

Generally, no treatment of the seed is done. However, the farmers of Nagaland keep the seed rhizomes in the sun for a period of 20– 30 days before planting, while in Meghalaya, they are kept in the sun for only a day. Rhizome sets should be treated with cow dung and urine preparation such as amrut pani/jeevamrut/panchagavya/ cow pat pit, etc.

10.6 Cultivation

While preparing the land, minimum tillage operations may be adopted. Beds of 15 cm height, 1 m width and of convenient length may be prepared, giving 50 cm spacing between beds. Solarisation of beds is beneficial for checking the multiplication of pests and disease-causing organisms. Solarisation is a technique by which polythene sheets are spread over moist field beds, covering all sides and being thus exposed to the sun for a period of 20–30 days. The polythene sheets used for soil solarisation should be stored safely once the work is completed

10.7 Sowing methods (if directly sown)

At the time of planting, apply 25 gm. powdered Neem cake and mix well with the soil in each pit at a spacing of 20–25 cm within and between rows. Seed rhizomes may be put in shallow pits and mixed well with decomposed cattle manure or compost mixed with Trichoderma (10 gm. compost inoculated with Trichoderma). However, in the northeastern region, ginger and turmeric is planted directly in the main field. Seed rhizomes are planted randomly in shallow pits of 5 cm depth and at a plant-to-plant spacing of 15 cm (approximately) in the hill districts of Assam. In Meghalaya and Nagaland, about 45 cm distance is maintained between the rhizomes that are covered with soil (1–1½ inches) and smoothed over by hand. In mixed cropping, seeds of chili, brinjal, papaya, pumpkin, etc., are mixed and broadcast in the ginger planted field in Assam and Meghalaya; whereas in Nagaland, a nursery is prepared for chili, brinjal, tomato, papaya, etc., and these crops are transplanted in between the furrows of the ginger/turmeric crop.

10.8 Managing soil fertility

Mulching the ginger beds with green leaves is an essential operation to enhance germination of seed rhizomes and prevent the soil from washing off due to heavy rains. It also helps to add organic matter to the soil and conserve moisture during the latter part of the cropping season. The first mulching with green leaves @ 10–12 MT/Ha is at the time of planting. It is repeated @ 5 MT/Ha 40 and 90 days after planting. Use of Lantana camara and Vitex negundo as mulch may reduce the infection of shoot borer. Cow dung slurry or liquid manure may be poured on the bed after each mulching to enhance microbial activity and nutrient availability. For the management of soil fertility,

the farmers mostly incorporate leguminous crops like pigeon pea, black gram, cowpea, cluster bean and french bean as green manure crops. Besides improving soil fertility, these are income-generating crops and have a good market demand. Some farmers use wood ash in the field as this increases the potash content of the soil. In Meghalaya, compost or cattle manure is used to enrich soil fertility.

10.9 Nutrients

Ginger and turmeric are nutrient-exhausting crops. Therefore, intercropping with leguminous crops, crop rotation and use of cattle manure are practiced in order to replace the nutrients exhausted by the previous crop. Application of well-decomposed cow dung or compost @ 5–6 t/Ha may be applied as a basal dose while planting the rhizomes in the pits. An additional application of Neem cake @ 2 MT/ Ha is desirable. Generally in the northern region ginger / turmeric cultivation is mostly on freshly prepared land, where adequate nutrients are already available. Addition of cattle manure before plantation is not very popular, though it is advisable in order to enhance the yield.

10.10 Water requirements

Generally in the northeastern region the source of water is from seasonal rainfall, rivers and natural perennial streams. Since the source of water is from seasonal rainfall and perennial streams, the assessment of water quality may be carried out as per the norms and guidelines of permitted organic package of practices.

Requirement

Moderate rainfall is required at the time of sowing till the rhizomes sprout; fairly heavy and well-distributed showers during the growing period; and dry weather for about a month before harvesting. A proper drainage channel in between the bunds to drain off stagnant water is advisable to ensure optimum drainage for better plant stand. Mulching of ginger beds helps in soil and water conservation. The first mulching is done at the time of planting with 12.5 MT of green leaves/Ha and the second is done after 40 days with 5 MT of green leaves/ha.

Conservation techniques

Mulching conserves soil moisture by checking evaporation loss. Bunds are constructed to prevent soil erosion and to retain the topsoil and proper drainage channels are provided to drain off stagnant water. Seasonal legumes are also grown along with ginger to suppress weed growth, minimize soil erosion and enhance soil fertility.

10.11 Integrated Pest Management

Do's	Don'ts
Grow only recommended/tested varieties.	Don't grow varieties unsuitable for the season or region
Seed rhizomes should be free from any infection or infestation. Biocides like Trichoderma may be used while planting seed rhizome.	Don't treat the seed rhizomes with any chemicals.
Remove weeds by hand weeding before each mulch and biofertiliser application	Don't forget weeding before mulching and biofertiliser application.
Use biofertiliser as per soil test recommendation.	Don't mix micronutrients with bio fertilizers and incorporate in the soil
Proper drainage facilities must be provided to drain off stagnant water. Best choice of land should be with a gentle slope. Gently sloping land is best.	Don't allow water to be stagnant. Don't select flat land for cultivation of ginger/turmeric to avoid water stagnation.
Visit the field periodically to check for pests or disease.	Don't use chemical pesticides
Install light traps for collecting and monitoring shoot borer adult moths, if such infestation is observed.	Don't use insecticides.

10.12 Animal and Rodent Pests

In some areas, rodents damage the ginger crop by making holes in the fields. Sometimes, monkeys, buffaloes, wild boar and other grazing animals also destroy the ginger cultivation by grazing or trampling over it.

Management - Traps are used to catch and kill rodents. In the hill districts, growers prefer to cultivate ginger/turmeric in sloping and steep areas, as the crop will be protected from grazing animals and rodent pests. Intercropping ginger with paddy or other crops reduces or lessens pest attacks.

10.13 Beneficial insects

Planting a variety of vegetable crops supports a wider range of beneficial insects, soil microorganisms and other factors that add to the overall healthy growth of the crop and result in higher yield. Natural predator insects and animals feed on the shoot borer, thus reducing the pest population. Birds are particularly beneficial as they feed on insect pests and grubs.

10.14 Post-harvest management

The crop is ready to harvest in about eight to ten months depending upon the maturity of the variety. When fully mature, the leaves turn yellow and start drying up gradually. Clumps are lifted carefully with a spade or digging fork and rhizomes are separated from dried leaves, roots and adhering soil. The harvested mother rhizomes are separated from the remaining clumps.

10.15 Cleaning

Cleaning of harvested ginger and turmeric is usually done by hand. After the soil particles are removed and the mother rhizomes separated, the harvested ginger is kept in the sun for drying from a few hours to a day. The duration of drying varies from area to area depending upon the availability of sunlight.

10.16 Drying

Generally the farmers of the northeastern region keep the harvested rhizomes in the sun for 2–3 hours (hill districts of Assam) or for a day (Meghalaya) on an average. The harvested ginger is kept on raised wooden/bamboo platforms inside the shed, either for seed or for sale.

10.17 Packaging

Cleaned or dried ginger/turmeric is kept in gunny bags. In hilly areas, many of the farmers also carry the ginger in baskets or store the crop in bamboo baskets lined with dried banana leaves for transportation.

10.18 Storage

No storage godown treatment is followed as the ginger is sold within a short span of time (one week). In Meghalaya and the hill district of Assam, the harvested ginger/turmeric is kept in pits with layers of sand in between. Dry leaves or green leaves are used to protect the ginger from sunlight or rain. Thatched huts are also constructed to protect ginger from rain and sunlight.

The rhizomes to be used as seed material should be preserved carefully. The indigenous practice is to spread layers of leaves of *Glycosmis pentaphylla* with the seed material. In order to get good germination, the seed rhizomes are stored properly in pits in the shade. Healthy and disease-free clumps are marked in the field when the crop is 6–8 months old and still green. Seed rhizomes are stored in pits of convenient size made inside the shed and protected from the sun and rain. The walls of the pits may be coated with cow dung paste. Seed rhizomes are stored in layers

along with well dried sand/saw dust. Sufficient gap is to be left at the top of the pits for adequate aeration. The pits need inspection once in twenty days to remove shriveled and disease affected rhizomes. In some areas, the rhizomes are loosely heaped over a layer of sand or paddy husk placed in a thatched shed and covered with dry leaves.

10.19 Storage pests

Generally no pest management practices are adopted during the storage of ginger as storage periods are generally short. The only care taken is that the storage area should not be damp or wet.



11 Annexures

11.1 List of Major Organic Importers

Country	Name of the Importer	Products
Germany	Ulrich Walter GmbH Lebensbaum	Spices, Tea, Coffee, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger, Lemon Grass
Netherlands	EcO2 B.V	Dried fruits, Nuts, Seeds, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger, Lemon Grass
Switzerland	Erboristi Lendi SA	Medicinal plants, Herbs, Tea, All spice, Cardamom, Ginger, Mustard, Pepper, Paprika, Saffron, Vanilla, Cinnamon, Chili powder, Coriander, Cumin, Curry, Garlic, Lemon Grass, Dried Vegetables
Switzerland	Pakka AG	Coffee, Cocoa beans, Dried fruits, Ground nuts, Nuts, Prepared and preserved nuts, Wild fruits and nuts, Pepper, Vanilla, Cinnamon, Chillies, Curry, Ginger, Coriander
Denmark	Bio Trading A/S	Malt, Eggs, Starch, Seeds, Chocolate , Sugar, Dried fruits, Spices, Tree seed oils, Cocoa
France	Arcadie S.A.	Spices, Dried leguminous vegetables, Medicinal plants, Dried medicinal plants , Aromatic plants, Dried aromatic plants
Germany	COSMOVEDA	Tea, Spices, Mange-tout
Germany	Denree Versorgungs GmbH	Potato products, Vegetables, Frozen vegetables, Frozen berries, Meat and Poultry, Fish, Dairy products, Fruits, Wine, Spices
Germany	Naturkost Uebelhoer KG	Oils, Grains, Seeds, Sugar, Jam, Beans, Pulses, Soybean products, Spices, Herbs, Nuts, Dried fruits, Flour, Rice
Germany	Pripa Exotic Fruchtimport	Dried fruits, Spices, Fruit Juices, Nuts, Fruit puree, Coconut, Coconut products, Banana, Mango, Pineapple, Papaya, Jackfruit, Cinnamon, Cardamom, Pepper, Nutmeg, Dried mango, Dried pineapple, Dried papaya
Germany	Ulrich Walter GmbH Lebensbaum	Spices, Tea, Coffee, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger, Lemon Grass
Germany	Worleé NaturProdukte GmbH	Fruits, Herbs, Mushrooms, Oil seeds, Nuts, Onion, Rice, Spices, Seeds, Tea, Vegetables
Netherlands	Doens Food Ingredients BV	Beans, Cocoa, Dried fruits, Dried Vegetables, Fats, Flour, Grains, Herbs, Lentils, Nuts, Oils, Oil seeds, Peas, Rice, Salt, Seeds, Sugar, Soybeans , Soybean products, Spices, Starch, Tea
Netherlands	Euroherb B.V.	Herbs, Spices, Tea, Vegetables
Switzerland	Aux mille saveurs S.A.	Fruits, Vegetables, Dried fruits, Spices
Switzerland	DIXA AG	Herbs, Spices
Switzerland	Horizonti Kräuterhandel GmbH	Spices, Herbs
Switzerland	J. Carl Fridlin Gewürze	Spices

Country	Name of the Importer	Products
United Kingdom of Great Britain and Northern Ireland (the)	Free World Trading	Dried fruits, Nuts, Pulses, Spices, Rice, Beans, Seeds
United Kingdom of Great Britain and Northern Ireland (the)	Hider Food imports	Banana, Dried fruits, Cereals, Nuts, Spices, Coffee, Pulses
United Kingdom of Great Britain and Northern Ireland (the)	Tropical Wholefoods	Dried fruits, Mushrooms, Spices, Soap, Nuts, Dried Vegetables, Snack bars
Pakistan	SS Group of Companies	Fruit Juices, Cereals, Basmati Rice, Cotton, Fresh fruits and vegetables, Processed food, Cardamom, Pepper, Chillies, Coriander, Cumin, Garlic, Ginger
Bangladesh	vibrator international ltd	Cotton, Clothes, Garlic, Ginger
United States of America	Nationwide Trucking	Coffee, Tea, Fruit Juices, Plant based drinks, Vegetable juices, Cereals, Rice, Essential oils, Herbal extracts, Natural Gums, Cotton, Clothes, Dried fruits, Fresh fruits and vegetables, Frozen fruits, Ground nuts, Nuts, Food supplements, Plant extracts, Fats, Oil seeds, Baby food, Bakery products, Confectionary products, Chocolate , Processed food, Muesli, Pasta, Sugar, Plants, Seeds, Spices, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger, Lemon Grass, Frozen vegetables
United States of America	Orgenetics, Inc.	Extracts, Dried fruits, Plant extracts, Cardamom, Vanilla, Cinnamon, Coriander, Cumin, Dried Vegetables, Lemon Grass
United States of America	Texas Herb Company	Tea, Body care preparations, Essential oils, Herbal extracts, Natural gums, resins and balsams, Clothes, Appetite regulators and substitutes, Capsules, ampoules, Energy biscuit bars, Food supplements, Plant extracts, Products for extra strength, Vegetable fats, All spice, Cardamom, Mustard, Pepper, Coriander, Cumin, Garlic, Ginger, Lemon Grass
United States of America	Vanilla, Saffron Imports	Tea, Essential oils, Flavouring additives, Herbal extracts, Saffron, Vanilla
United States of America	CSL International Corp	Essential oils, Herbal extracts
United States of America	Navigators Group Inc.	Honey, Coffee, Cocoa beans, Natural gums, resins and balsams, Nuts, Ground nuts, Oil seeds, Seeds, Chillies, Ginger
United States of America	American Health and Nutrition/The Organic Garden	Beans, Cocoa beans, Cocoa, Seeds, Dried fruits, Nuts, Soybean products, Herbs, Spices
Brazil	Harkaz Parsek Sondagem &Fomento	Honey, Coffee, Cocoa beans, Non-alcoholic beverages, Fruit Juices, Vegetable juices, Vegetable fats, Chocolate
Ethiopia	Globe Enterprise	Drinks, Rice, Essential oils, Food additives, Sugar, Cardamom, Mustard, Pepper, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger

Source: <http://www.intracen.org/itc/sectors/organic-products/importers/>

11.2 List of Major Indian Organic Spice Exporters

S. No.	Company Name	Products
1	Agronic Food Inc.	Honey, Milk and dairy products, Coffee, Cocoa beans, Tea, Non-alcoholic beverages, Fruit Juices, Vegetable juices, Cereals, Cereal flour, Cereal grain products, Rice, Herbal extracts, Vegetable saps and extracts, Natural gums, resins and balsams, Body care preparations, Essential oils, Cotton, Clothes, Dried fruits, Fresh fruits, Wild fruits and nuts, Prepared and preserved fruit (compotes, marmalades, jams, jellies, purée,...), Ground nuts, Nuts, Prepared and preserved nuts, Extracts, Food supplements, Vegetable fats, Oil seeds, Chocolate, Processed food, Organic fertilizers, Plants, All spice, Cardamom, Mustard, Pepper, Paprika, Saffron, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables, Frozen vegetables, Fresh vegetables, Preserved vegetables
2	Fairtrasa International	Coffee, Tea, Mate, Cocoa beans, Alcoholic beverages, Non-alcoholic beverages, Fruit Juices, Vegetable juices, Plant based drinks, Cereals, Cereal grain products, Cereal flour, Groats, meal and pellets of cereals, Rice, Essential oils, Dried fruits, Frozen fruits, Prepared and preserved fruit (compotes, marmalades, jams, jellies, purée,...), Nuts, Ground nuts, Prepared and preserved nuts, Wild fruits and nuts, Food supplements, Oil seeds, All spice, Cardamom, Mustard, Pepper, Saffron, Paprika, Vanilla, Cinnamon, Chili powder, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables
3	Greencover Overseas	Fruit Juices, Cardamom, Mustard, Pepper, Chillies, Coriander, Ginger, Fresh fruits and vegetables
4	Kancor Ingredients Ltd.	Essential oils, Herbal extracts, Plant extracts, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chillies, Coriander, Cumin, Garlic, Ginger, Lemon Grass, Paprika, Saffron, Flavoring additives
5	M.S.S. Asan Exports	Honey, Essential oils, Herbal extracts, Natural Gums, Resins, Plant extracts, Cardamom, Lemon Grass
6	M/S Khetanshu Agherbs	Edible products of animal origin, Honey, Fruit Juices, Vegetable juices, Cereals, Herbal extracts, Vegetable saps and extracts, Dried fruits, Fresh fruits, Ground nuts, Capsules, ampoules, Plant extracts, Products for extra strength, Food supplements, Oil seeds, Muesli, flakes, Processed food, Organic fertilizers, Plants, Seeds, All spice, Mustard, Pepper, Paprika, Cardamom, Saffron, Vanilla, Cinnamon, Chillies, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables, Frozen vegetables, Fresh vegetables, Preserved vegetables, Legumes
7	Mapas International	Honey, Milk and dairy products, Tea, Fruit Juices, Plant based drinks, Vegetable juices, Cereals, Cereal flour, Cereal grain products, Rice, Essential oils, Herbal extracts, Natural gums, resins and balsams, Vegetable saps and extracts, Dried fruits, Frozen fruits, Fresh fruits, Nuts, Ground nuts, Wild fruits and nuts, Plant extracts, Oil seeds, Processed food, Plants, Cardamom, Pepper, Paprika, Chillies, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables, Frozen vegetables, Fresh vegetables, Preserved vegetables
8	Natureland Organic Foods	Honey, Coffee, Tea, Cereals, Cereal products, Cotton, Fresh fruits and vegetables, Oil seeds, Bakery products, Processed food, Seeds, Cardamom, Mustard, Chillies, Coriander, Cumin, Garlic, Ginger, Dried Vegetables

S. No.	Company Name	Products
9	Novozymes South Asia Pvt Ltd	Coffee, Tea, Fruit Juices, Plant based drinks, Vegetable juices, Cereals, Rice, Essential oils, Herbal extracts, Natural Gums, Resins, Cotton, Clothes, Dried fruits, Fresh fruits and vegetables, Frozen fruits, Ground nuts, Nuts, Oil seeds, Bakery products, Confectionary products, Processed food, Sugar, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Chili powder, Coriander, Cumin, Garlic, Ginger, Lemon Grass, Dried Vegetables, Frozen vegetables
10	Organic Foods India	Ginger, Cardamom, Vanilla, Green pepper, Sesame, Coriander, Pepper, Chilies, Mustard, Sweet tamarind
11	Pharmaceutical Export Promotion Council (Pharmexcil)	Flavouring additives, Essential oils, Colouring and gelling agents, Natural gums, resins and balsams, Herbal extracts, Plant extracts, Oil seeds, Cardamom, Pepper, Paprika, Saffron, Vanilla, Cinnamon, Chilies, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass
12	Plantrich Agri Tech Private Limited	Honey, Coffee, Tea, Cocoa beans, Cardamom, Pepper, Vanilla, Cinnamon, Chilies, Coriander, Ginger, All spice, Organic fertilizers
13	RIPL Export	Milk and dairy products, Cereals, Rice, Herbal extracts, Nuts, Cardamom, Mustard, Pepper, Chilies, Coriander, Cumin, Garlic
14	Rising Tradelinks	Coffee, Cereals, Cereal products, Rice, Spices, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Coriander, Cumin, Garlic, Ginger, Lemon Grass
15	Silverstone Trade Ltd.	Herbal extracts, Vegetable saps and extracts, Natural gums, resins and balsams, Fruits, Dried fruits, Processed Fruits , Frozen fruits, Wild fruits and nuts, Prepared and preserved fruit (compotes, marmalades, jams, jellies, purée,...), Prepared and preserved nuts, Nuts, Ground nuts, Processed food, Chocolate , Muesli, flakes, Pasta, Prepared meals, Sugar and sugar confectionary, Seeds, All spice, Cardamom, Mustard, Pepper, Paprika, Saffron, Vanilla, Cinnamon, Chilies, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables, Frozen vegetables, Fresh vegetables, Preserved vegetables, Legumes
16	Tata Coffee Limited	Coffee, Cardamom, Pepper
17	The Xenon International	Edible products of animal origin, Honey, Live animals, Meat and Poultry, Fruit Juices, Vegetable juices, Cereals, Cereal flour, Cereal grain products, meal and pellets of cereals, Rice, Cotton, Clothes, Dried fruits, Fresh fruits and vegetables, Frozen fruits, Ground nuts, Nuts, Prepared and preserved nuts, Wild fruits and nuts, Animals fats, Vegetable fats, Oil seeds, Baby food, Bakery and confectionary products, Processed food, Seeds, All spice, Cardamom, Mustard, Pepper, Paprika, Saffron, Vanilla, Cinnamon, Chilies, Coriander, Cumin, Curry, Garlic, Ginger, Lemon Grass, Dried Vegetables, Fresh vegetables, Frozen vegetables, Legumes, Preserved vegetables
18	Wayanad Social Service Society	Spices, Cardamom, Vanilla, Cinnamon, Black pepper, White pepper, Nutmeg, Turmeric
19	Aditya Organic	Cereals, Rice, Essential oils, Herbal extracts, Cotton, Allspice Oil, Natural plant fertilizer
20	G.K.Impex	Honey, Cereals, Cereal products, Rice, Essential oils, Food additives, Herbal extracts, Extracts, Plant extracts, Fresh fruits and vegetables, Oil seeds, Natural plant fertilizer, Mustard, Lemon Grass
21	Himachal Phytochem Private Limited	Essential oils, Food additives, Herbal extracts, Plant extracts
22	Hortishoppe & Guroo Farms	Food additives, Essential oils, Herbs, Herbal extracts, Lemon Grass, Sugar, Confectionary products

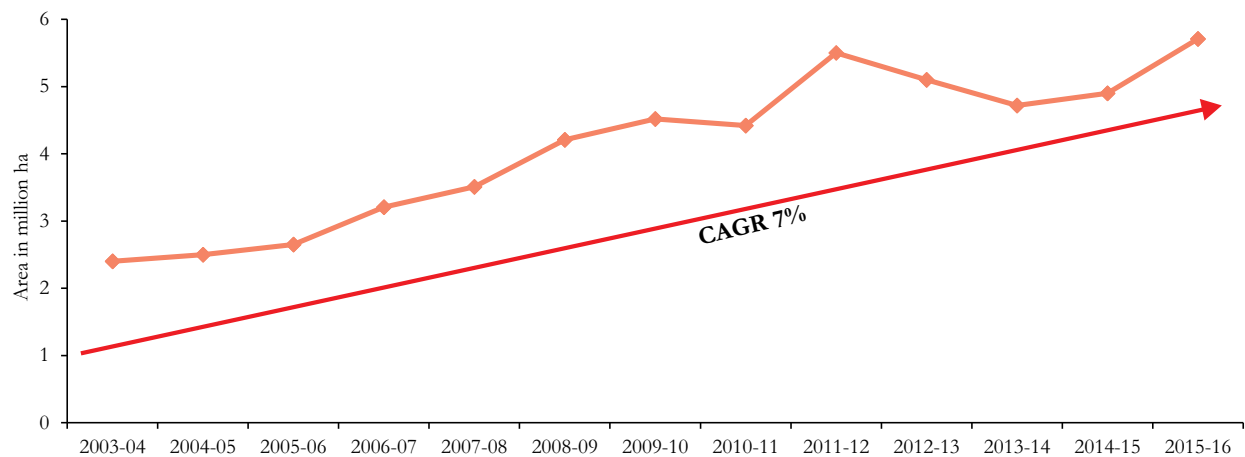
S. No.	Company Name	Products
23	Indian Organic Food	Basmati Rice, Long grain rice, Muesli, Pulses, Soybeans , Essential oils, Spices, Seeds
24	King Farms	Eggs, Milk, Dairy products, Fruit Juices, Plant based drinks, Vegetable juices, Cereals, Cereal products, Rice, Essential oils, Herbal extracts, Natural Gums, Cotton, Clothes, Dried fruits, Fresh fruits and vegetables, Oil seeds, Plants, Seeds, Mustard, Chilies, Coriander, Cumin, Garlic, Ginger, Dried Vegetables, Natural plant fertilizer
25	Manas Krushi Farm	Fresh fruits and vegetables, Cashew Nuts, Rice, Essential oils
26	Medors Biotech Pvt. Ltd.	Body care preparations, Herbal extracts, Essential oils, Oil seeds, Organic fertilizers, Seeds, Plants
27	Mukesh Varma Green Network	Spices, Dried fruits, Processed Fruits , Agricultural Produce in general, Essential oils, Medicinal plants
28	Phalada Agro Research Foundations Pvt. Ltd.	Spices, Pepper, Vanilla, Medicinal plants, Aromatic plants, Essential oils
29	Salorganics	Tea, Cereals, Cereal products, Rice, Essential oils, Cotton, Clothes, Fruits, Marmalades, Jam, Sugar, Spices
30	Sresta Natural Bioproducts Pvt. Ltd.	Honey, Fruit Juices, Cereals, Cereal products, Rice, Grain products, Essential oils, Cotton, Fruits, Dried fruits, Frozen fruits, Nuts, Ground nuts, Jam, Marmalades, Vegetable oils, Oil seeds, Bakery products, Confectionary products, Processed food, Sugar, Spices, Vegetables, Dried Vegetables, Frozen vegetables
31	Sri Mata Bio Source	Vegetables, Spices, Essential oils
32	JK Agri Genetics Ltd.	Cereals, Cereal grain products, Nuts, Oil seeds, Mustard, Pepper, Chilies, Coriander, Cumin, Garlic, Ginger
33	Umalaxmi Organics Pvt. Ltd.	Cereal products, Herbal extracts, Plant extracts, Food supplements, Oil seeds, Chilies, Cumin, Garlic, Ginger, Lemon Grass
34	Vantage Organic Foods Private Limited	Cereals, Cereal products, Oil seeds, Mustard, Pepper, Chilies, Coriander, Cumin, Garlic, Ginger, Groats, meal and pellets of cereals
35	Vedicare Ayurveda Pvt. Ltd.	Honey, Drinks, Fruit Juices, Cereals, Cereal products, Fruit puree, Marmalades, Jam, Fruit jellies, Food supplements, Processed food, Mustard, Chilies, Coriander, Cumin, Garlic, Ginger, Lemon Grass
36	Aryan International	Honey, Spices, Tree seed oils, Nuts
37	G.K.Impex	Honey, Cereals, Cereal products, Rice, Essential oils, Food additives, Herbal extracts, Extracts, Plant extracts, Fresh fruits and vegetables, Oil seeds, Natural plant fertilizer, Mustard, Lemon Grass
38	Heavenly Farms	Cereals, Spices, Fruits, Sugar Cane, Fresh fruits and vegetables, Herbs, Honey
39	Kashmir Apiaries	Honey
40	Little Bee Impex	Honey, Honey products
41	Manas Global Exports	Honey, Tea, Cereal grain products, Rice, Body care preparations, Herbal extracts, Cotton, Clothes, Dried fruits, Fresh fruits, Frozen fruits, Ground nuts, Nuts, Energy biscuit bars, Muesli, flakes, Processed food, Organic fertilizers, All spice, Dried Vegetables, Frozen vegetables, Fresh vegetables, Preserved vegetables
42	CGH Earth	Spices

S. No.	Company Name	Products
43	IITC Organic India Pvt Ltd	Spices, Tea, Herbs, Organic products
44	Indian Organic Food	Basmati Rice, Long grain rice, Muesli, Pulses, Soybeans , Essential oils, Spices, Seeds
45	Kurinji Organic Foods (I) Pvt Ltd	Pineapple, Mango, Pears, Spices, Coconut
46	Magosan Exports Pvt. Ltd	Spices, White pepper, Oils, Herbal extracts, Dried medicinal plants
47	Nature foods	Basmati Rice, Wheat, Cereals, Sugar, Lentils, Herbs, Spices
48	Poabs Organic Products	Spices, Tea, Coffee, Herbs
49	Rising Tradelinks	Coffee, Cereals, Cereal products, Rice, Spices, Cardamom, Mustard, Pepper, Vanilla, Cinnamon, Coriander, Cumin, Garlic, Ginger, Lemon Grass
50	Spices Board India	Spices, Herbs

Source: Intracen.org

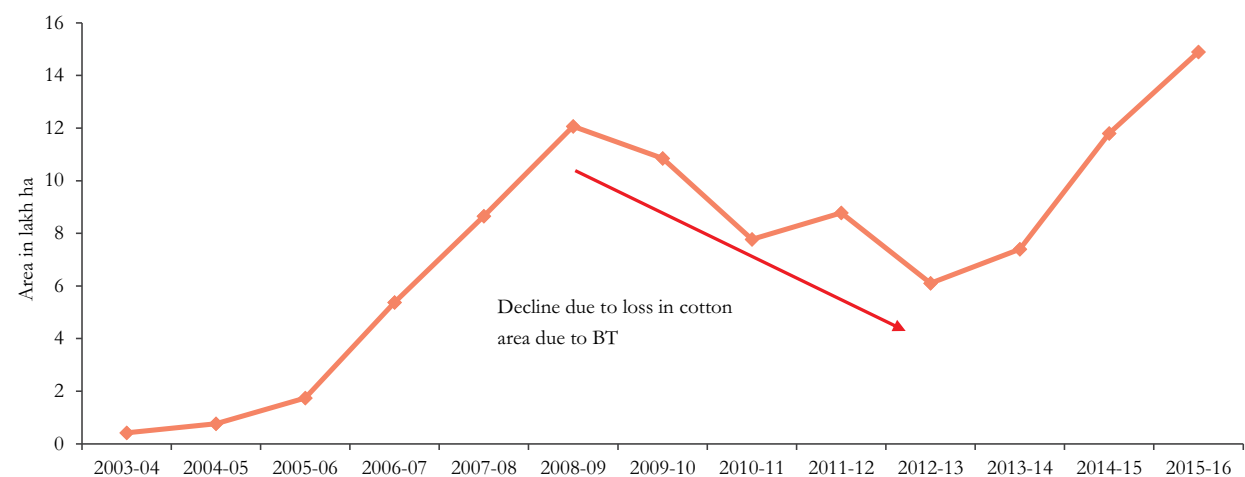
11.3 Supporting Data Exhibits

Exhibit 81: Growing area under Organic certification in India (Wild harvest and farm area)



Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

Exhibit 82: Growth in certified farm area in India



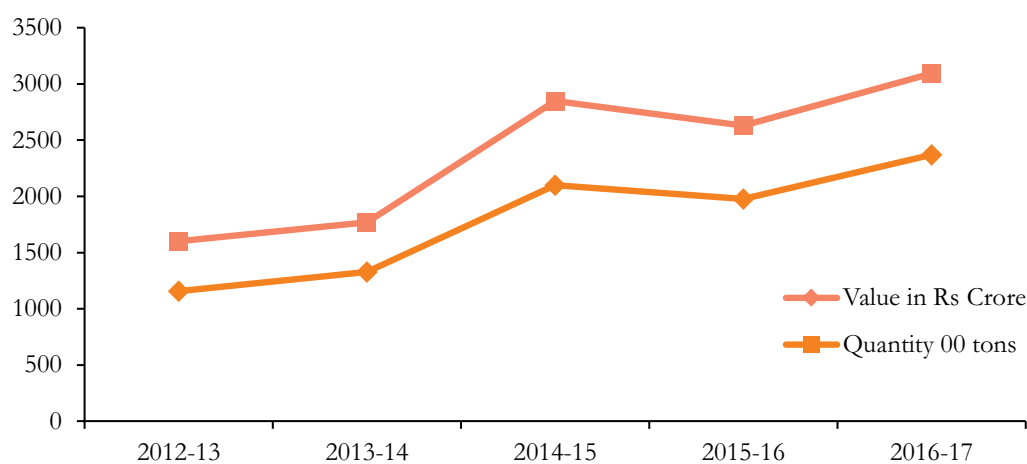
Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

Exhibit 83: The key categories of food that are produced organically in India

Category	Production in MT
Oil seeds	300,057
Sugar crops	281,713
Cereals and millets	196,221
Fiber crops	155,136
Pulses	62,676
Medicinal, Herbal and Aromatic	33,477
Plantation crops	47,837
Spices and condiments	36,240

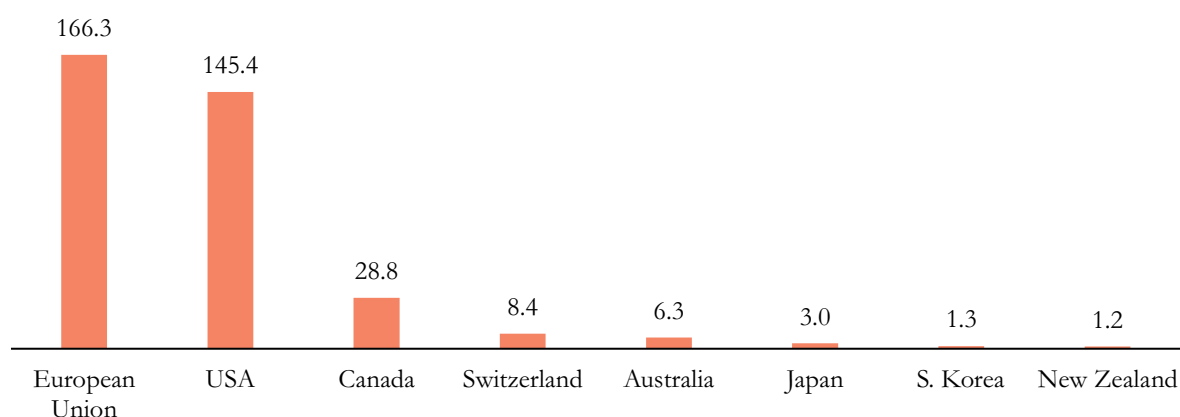
Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

Exhibit 84: Trend in organic exports from India (2012-13 to 2016-17)



Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

Exhibit 85: Key export destinations for export from India (INR Crore)



Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

Exhibit 86: Key Organic Export Categories

Rank	Crop commodity	Quantity in lakh MT
1.	Oil seeds	1.32
2.	Cereals and millets	0.44
3.	Processed foods	0.67
4.	Tea	0.054
5.	Pulses	0.048
7.	Dry fruits	0.024
8.	Spices and condiments	0.030
9.	Medicinal	0.022
10.	Coffee	0.022

Source: The Agricultural and Processed Food Products Export Development Authority, APEDA

11.4 Methodology for shortlisting of commodities

A matrix has been created basis the parameters elucidated in the earlier chapters to narrow down to the key spices produced in the state. The first level of shortlisting has been done basis production and marketable surplus

STEP 1: Mapping production and their contribution to all spices produced in the shortlisted states

Unit 000 MT	Pepper	Ginger	Chilies	Turmeric	Garlic	Cardamom	Coriander	Fenugreek	Cinnamon
Meghalaya									
Production	0.7	65.4	2.1	15.9	1.1		0.1		5.0
% Contribution	1%	72%	2%	18%	1%		1%		6%
Mizoram									
Production		31.7	9.3	27.8					
% Contribution		46%	14%	40%					
Nagaland									
Production		43.6	4.0	10.7	2.9	2.0	0.2		
% Contribution		69%	6%	17%	5%	3%	0%		
Uttarakhand									
Production		19.6	7.2	1.7	1.9		3.8	2.6	
% Contribution		53%	19%	5%	5%		10%	7%	

STEP 2: Shortlisting of commodities which have a production and marketable surplus of greater than 1,000 MT and % contribution of more than 5% to the spices production basket.

Unit 000 MT	Pepper	Ginger	Chilies	Turmeric	Garlic	Cardamom	Coriander	Fenugreek	Cinnamon
Meghalaya									
Production	0.7	65.4	2.1	15.9	1.1		0.1		5.0
% Contribution	1%	72%	2%	18%	1%		1%		6%
Marketable Surplus	0.6	56	2	11	0.9		0.0		4.5
Marketable Surplus (%)	80%	85%	90%	70%	80%		90%		90%

Unit 000 MT	Pepper	Ginger	Chilies	Turmeric	Garlic	Cardamom	Coriander	Fenugreek	Cinnamon
Mizoram									
Production		31.7	9.3	27.8					
% Contribution		46%	14%	40%					
Marketable Surplus		26.9	8.4	23.6					
Marketable Surplus (%)		85%	90%	85%					
Nagaland									
Production		43.6	4.0	10.7	2.9	2.04	0.2		
% Contribution		69%	6%	17%	5%	3%	0%		
Marketable Surplus		49.7	35.3	8.2	2.3	1.4	0.2		
Marketable Surplus (%)		90%	70%	80%	99%	90%	90%		
Uttarakhand									
Production		19.6	7.2	1.7	1.9		3.8	2.6	
% Contribution		53%	19%	5%	5%		10%	7%	
Marketable Surplus		16.7	6.5	1.5	1.7		3.4	2.3	
Marketable Surplus (%)		85%	90%	85%	90%		90%	90%	

STEP 3: For the shortlisted commodities, analyze other parameters as defined above, to arrive at the key spice/spices in each state

	Ginger	Turmeric	Tejpat/ Cinnamon
Meghalaya			
Unit Value (Domestic)	2	2	2
Current organic production- certified area	1	2	3
Scope for organic- conversion	1	1	3
Export potential- global trade	1	2	2
India's Rank in export globally	2	1	3
Scope for value addition	1	1	3
Potential for premium	1	1	2
Recognized brand value/GI	2	2	3
Average	1.4	1.5	2.6

Mizoram	Ginger	Chilies	Turmeric
Unit Value (Domestic)	2	1	2
Current organic production- certified area	1	3	2
Scope for organic- conversion	1	3	2
Export potential- global trade	1	1	2
India's Rank in export globally	2	1	1
Scope for value addition	1	2	1
Potential for premium	1	1	1
Recognized brand value/GI	3	1	3
Average	1.5	1.6	1.8

Nagaland	Ginger	Chilies	Turmeric
Unit Value (Domestic)	2	1	3
Current organic production- certified area	1	2	3
Scope for organic- conversion	1	1	2
Export potential- global trade	1	1	2
India's Rank in export globally	2	1	1
Scope for value addition	1	2	1
Potential for premium	1	1	1
Recognized brand value/GI	3	1	3
Average	1.5	1.3	2.0

Uttarakhand	Ginger	Chilies	Coriander	Fenugreek
Unit Value (Domestic)	2	1	1	3
Current organic production- certified area	1	2	3	3
Scope for organic- conversion	1	2	3	3
Export potential- global trade	1	1	3	2
India's Rank in export globally	2	1	1	2
Scope for value addition	1	2	3	3
Potential for premium	1	2	3	3
Recognized brand value/GI	3	3	3	3
Average	1.5	1.9	2.5	2.8

1	High	For GI	1
2	Medium		2
3	Low		3
For exports		For rank	1
1	Above USD 500		2
2	250-500		3
3	Below 250		

For each of the states, the commodities scoring an average of less than 2 have been selected for detailed analysis. Basis the matrix above the following are the identified key spices in the 4 states.



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