Status of Agricultural Markets and Value Chain in Tripura

Working paper 2

MANAGE Centre for Agricultural Extension Innovations, Reforms and Agripreneurship

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About the publication

This working paper is the result of field study conducted in Tripura state during January, 2018 and is based on the observations of and the interactions with officials from different extension stakeholders in the state in agriculture and allied sectors.

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Disclaimer

The views expressed in the document are not necessarily those of MANAGE or officials with whom the authors interacted but are of the authors' own based on the interactions and observations during the field study conducted in Tripura.

Foreword

Smt. V. Usha Rani, IAS
Director General, MANAGE

MANAGE has initiated working papers on Agricultural Extension Systems across the states of India and initiated the efforts with a scoping study in Tripura. In this regard, a scoping study was conducted in January 2017, to understand the current status of the extension systems in the state. As a follow-up activity, a Multi-Stakeholder Consultative Workshop was conducted to understand their perspective on the current status of extension system and involvement of MANAGE in terms of capacity development of the extensionists from agriculture and allied sectors. Based on the discussions, market led and value chain extension was identified as priority area of the agricultural sector in the state.

This follow up study emphasized diversification to horticulture, high value fish and animal husbandry, and required technology and input availability. For a small state like Tripura with high dependence on agriculture, entrepreneurship development will open up new avenues with introduction of required technologies. But the foremost focus needs to be on exploring potential markets both in the country and outside its international borders and develop trade relations to boost up its economy and usher in a conducive environment for economic development through agriculture.

(V. Usha Rani)

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Abbreviations

AC&ABC	Agri-Clinics and Agri-Business Centres
APEDA	Agricultural and Processed Food Products Export Development Authority
ARDD	Animal Resource Development Department
BPL	Below Poverty Level
CoF	College of Fisheries
CSS	Central Sector Scheme
DoA	Department of Agriculture
DoF	Department of Fisheries
DoH	Department of Horticulture
FSSAI	Food Safety and Standards Authority of India
GCMPUL	Gomati Co-operative Milk Producer's Union Ltd
HMNEH	Horticulture Mission for North East and Himalayan States
ICAR	Indian Council for Agricultural Research
ICT	Information and Communication Technologies
JPY	Japanese Yen
KVK	Krishi Vigyan Kendra
MANAGE	National Institute of Agricultural Extension Management
MIDH	Mission for Integrated Development of Horticulture
NBM	National Bamboo Mission
NFSM	National Food Security Mission
PKVY	Pradhan Mantri Krishi Vikas Yojana
R&D	Research and Development
RKVY	Rashtriya Krishi Vikas Yojana
SFAC	Small Farmers Agri-Business Consortium
SARS	State Agricultural Research Station
SHRS	State Horticultural Research Station
TLA	Tripura Livestock Development Agency
T-SAMETI	Tripura State Agricultural Management and Extension Training Institute
USD	US Dollar
WHO	World Health Organization

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- Suchiradipta Bhattacharjee
- Saravanan Raj

Executive Summary

Agricultural markets form crucial part of agrarian economies and impact the living standard of farm families including population dependent on agriculture. In agrarian economies like Tripura where majority of the rural population is dependent on some form of agriculture and scope in other sectors are quite low, market status becomes an important concern for economic development of the state. Identification of major market potential in agriculture, horticulture, fisheries, and animal resource in Tripura during first phase of State Working Paper initiative of MANAGE and subsequent 'Multi-stakeholder Consultative Workshop on Agricultural Extension Systems in Tripura' has led to the recurrent discussion of market structure and value chain issues in the state. To address the issues and come out with concrete recommendations, as second phase of the initiative, the present study was conducted to understand the status and potential of market and value chain on major commercial produce in agriculture and allied sectors of the state.

While agricultural crops grown in the state are not economically remunerative, horticulture has a large scope on the other hand. Fruits like pineapple, jackfruit, litchi, and banana has high potential in national as well as international market. Floriculture sector can also be tapped for high economic returns with Anthurium, Marigold, Gladiolus, and Dendrobium orchids. Fishery sector in the state is one of the most promising with steps to increasing self-sufficiency in production of commonly consumed fish like *Rohu* and *Katla* as well as culture of high value fish like *Pabda*, *Hilsa*, and Giant Fresh water Prawn. In animal resource sector too, a major portion of the local demand for milk, meat, and eggs are met from the local produce but the sector being highly unorganized, there is a lack of proper data about the same. Production potential of the state is yet to reach its optimum because of lack of technology and required infrastructure. Market infrastructure is only partly functional because of lack of transportation facilities, cold storage and warehouse infrastructure. The major challenges and issues in value chain development in Tripura are:

- Lack of producer aggregates: Due to lack of supervision and proper efforts of the concerned stakeholders like line departments in agriculture and allied sectors, there are no proper aggregates of producers. This reduces bargaining power of the producers and their share in consumers' money.
- Poor infrastructure: Infrastructure in terms of transportation, storage, and warehouses are very poor in the state which reduces shelf life of many commercial produce like pineapple, jackfruit, litchi, potatoes, fish, etc., compelling the farmers to go for farmgate selling of produce at a low price.
- Subsidy dependent rural population: Rural population in the state, because of lack of economically remunerative avenues of livelihood, are mostly dependent on subsidies and social security schemes. While this helps many rural families survive, there also is a rising need to find avenues for better income generation.
- Entrepreneurship development: Development of entrepreneurial qualities in the rural farming population, preferably the youth can help address unemployment problem, and accelerate economic development. But building infrastructure and focusing on market development and connectivity along with export strategy needs foremost attention for providing necessary support

structures which the state currently lacks.

- Agricultural marketing management: There is no marketing management infrastructure in the state. The Marketing Board of Agriculture Department is manned by one personnel while other line departments totally lack one. This has resulted in lack of marketing policies, study of market infrastructure, or development on the same.
- Research and development: Market research involves both farmer and consumer preferences, which are again non-existent in the state. Product development based on consumer preference is also almost nil, which further limits exploring the available demand and translating it into profits for the producers.

Some recommendations for development of a market focused production system in the state and evolve its agriculture based economy are as follows:

1. Market led production to help the farmers avoid distress sale that is predominant now and also help in streamlining agricultural as well as market related activities.
2. Entrepreneurship development riding on higher scope in agro-based development in the state compared to industrial development.
3. A dedicated marketing cell in all the departments of agriculture and allied sectors to properly understand the production and marketing status and plan interventions based on the needs of the sector.
4. Collaboration and partnership with APEDA as well as other agencies for export of fruits like pineapple, orange, and jackfruit.
5. Market and post-harvest infrastructure development along with focus on roads, warehouse, cold storage facilities for fruits, dairy products, and dressed meat.

Agricultural market for economic development

Agricultural systems are rapidly changing worldwide. The developed economies are increasingly moving towards a consumer oriented approach from a product-oriented approach to marketing consumer motivations underlying consumer behavior are becoming central consideration in marketing strategies of food products (Audenaert and Steenkamp, 1997). In the developing economies on the other hand, with fairly large number of population dependent on agriculture sector for livelihood, market led and consumer driven agricultural marketing are yet to catch up. Focus on production still takes up much of the research and development activities. But with globalization and liberalization of economies, agricultural trades have become increasingly important part of developing country economies, and in such global scenario, a market focused production is the necessity. In country like India where 70 percent of the rural households still depend on agriculture, market oriented production becomes need of the hour. Also, in current years agricultural development in India has been streamlined with focus on doubling farmers' income by 2022, which needs a clear vision on increasing producers' share in consumers' money. Along with promotion of technologies, there is also a need for creation of economic marketing channels with modern marketing practices.

Agriculture sector is not just for the economic development of the rural and poorest population of a country though. It provides the raw materials for industrial development, increases employment opportunities and promotes entrepreneurial development, helps in earning foreign exchange through exports, encourages institutional development - all leading to economic development of a country. Development of a strong market infrastructure and marketing system in agriculture sector translates to proper distribution of the produce, reduced wastage, and increased profits to farmers. But agricultural markets in India are plagued with challenges like lack of storage facility, distress sale, lack of transportation, unfavourable infrastructure, large number of intermediaries, unregulated markets, lack of post-harvest processing, and lack of institutional finance. But being a diverse country with varying factors that affect its agricultural sector, the challenges are mostly context-specific, and so, thorough understanding of the agricultural marketing situation is necessary to understand the strengths and weaknesses and suggest remedial measures.

One of the major issues identified during scoping study in Tripura and the following Multi-Stakeholder Consultative Workshop on 'Agricultural Extension Systems In Tripura' is the challenges of marketing in the agriculture and allied sectors (Usha Rani et al., 2017). So to understand in depth the issues concerning the same, a follow up study was taken up in the state to understand the current production and export potential of major commercial produce in agriculture and allied sectors; identify the market players and marketing channels in each sector, and explore opportunities for post-harvest processing and export potential to help in better recommendation for establishing a value chain extension infrastructure, connecting the state producers with other potential market players at national as well as international level. The following discussion focuses on the current production status of important commercial crops in agriculture, horticulture, fisheries, and animal resource sector; their marketing and value chain; major characteristics and challenges in the marketing process; and recommendations for development.

Income status of farmers in Tripura

According to the Situational Assessment Survey of Agricultural Households (SASAH) in India 2013, about 34 percent of the rural households in Tripura were primarily dependent on agriculture, of which, 50 percent belonged to Scheduled Tribe families. Cultivation was found to be the major source of income for 98 percent of the agricultural households followed by livestock rearing (26 %). In the state, there exists no data about income of agricultural households in the state. However, according to the SASAH 2013, average monthly income of agricultural households in the state was Rs. 5,426 earned through cultivation of crops, livestock, non-farm business and through wage/salaried employment while average monthly consumption expenditure was Rs. 6,922. The proportion of income from various activities are as below (Table 1):

Table 1: Proportion of monthly income of agrarian household in Tripura

Category	Monthly Income of Farm House-hold (In Rs.)	% share of monthly income against category of work
Cultivation	2773	51%
Wage/ Salary	2182	40%
Livestock	307	6%
Non-farm business	165	3%
Total	**5426**	**100%**

In 2012-13, an average monthly income of farm households in India was Rs.6,426. Punjab's farmers average monthly income had the highest at Rs.18,059 followed by those in Haryana (Rs. 14,434), Jammu & Kashmir (Rs.12,683) and Kerala (Rs. 11,888). Bihar's farmers earned the least with their monthly incomes averaging (Rs.3,558). Average monthly expenses incurred in agricultural activities was Rs. 935, while the average value of agricultural products was Rs. 3,733, giving an average monthly profit of Rs. 2,798. Only 22.9 percent of the agricultural households were found to have outstanding loans under different heads compared to a 55.9 percent national average (NSSO, 2014). With increased focus on doubling farmers' income across the country, there is an urgent need to have current data of farmers' income in the state based on which further planning needs to be done. But any strategies towards increasing farmers' income needs to consider them as producer as well as consumers, and so, the current study attempts at a detailed enumeration of the marketing channels and future potentials of major commercial crops of the state to ultimately help in formulating better policies and planning effective implementation.

Production status of agriculture and allied sectors

Agriculture

Rice is the staple crop of Tripura and agricultural sector in the state is still dominated by mono-cropping practices that emphasizes on the crop. While the state has almost achieved self-sufficiency in rice production with due emphasis from the Perspective Plan, the production is yet to achieve a surplus. Rice productivity in the state (3060 kg/ha) (DoA, 2017) is higher than the national average at 2404 kg/ha (DAC&FW, 2017). Tripura has also received the Krishi Karman Award 2015-16 and 2009-10 for commendable increase in food grain production in small category states with a productivity of 2,946 kg per hectare in 2016 (Business Standard, 2017). As per the Annual Plan 2017-18 of the Department of Agriculture, increasing production and productivity is the first priority in the state. There is also increased focus for introduction of pulses, oilseeds, millets, sesame, and cotton under Central Sector Schemes (CSS) like National Food Security Mission (NFSM), Rashtriya Krishi Vikas Yojana (RKVY), Paramparagat Krishi Vikas Yojana (PKVY), Mission Organic Value Chain for North East Region (MOVCDNER), and State Plan. But productions of these crops are still just picking up with various subsidies and assistance under the schemes but yet to be taken up on a large scale to cater to the market demand.

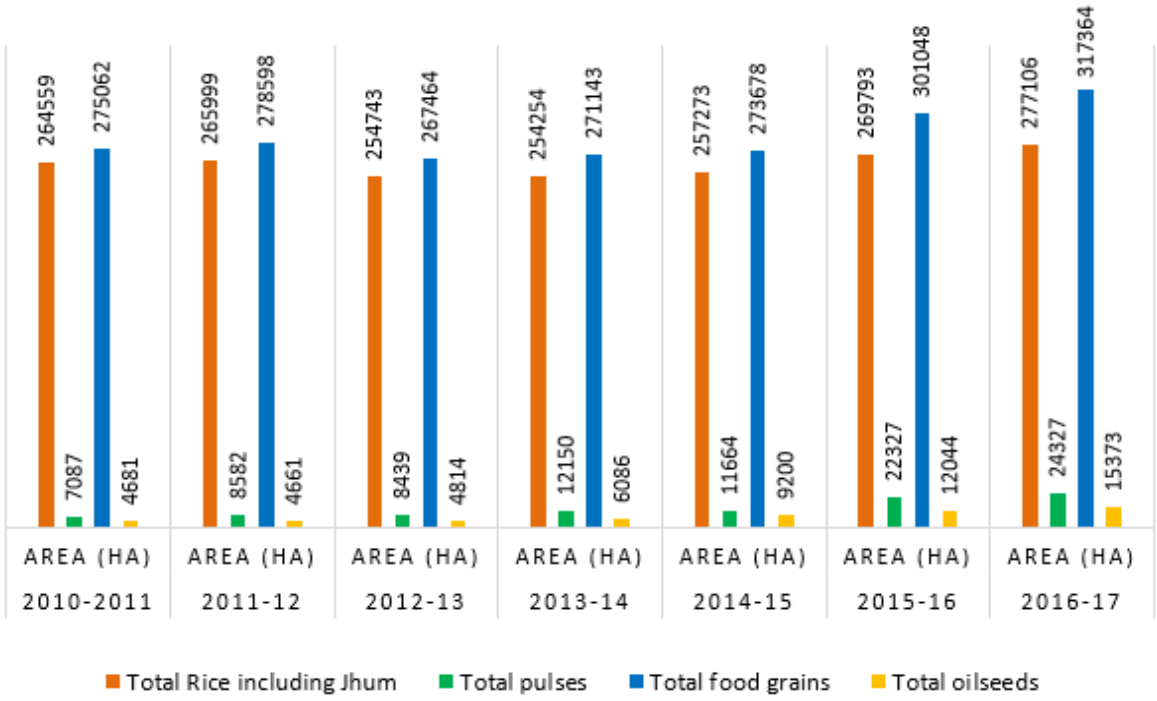

Fig. 1: Gross cropped area under major crops in the state during 2010-11 to 2016-17

Area under major agricultural crops in the state (Fig. 1) has remained more or less constant over the years, more so in totality. Introduction of the pulses and oilseeds has, in some cases, diverted areas previously under paddy to those crops, but that has happened in very few areas. Overall, as the scope of increase of area under cultivation is very limited due to topography and Recognition of Forest Rights (RoFR) lands and the only way out for the state to get out of the rut is to increase productivity or diversify to high value crops to increase income. In terms of production and productivity (Fig. 2 and

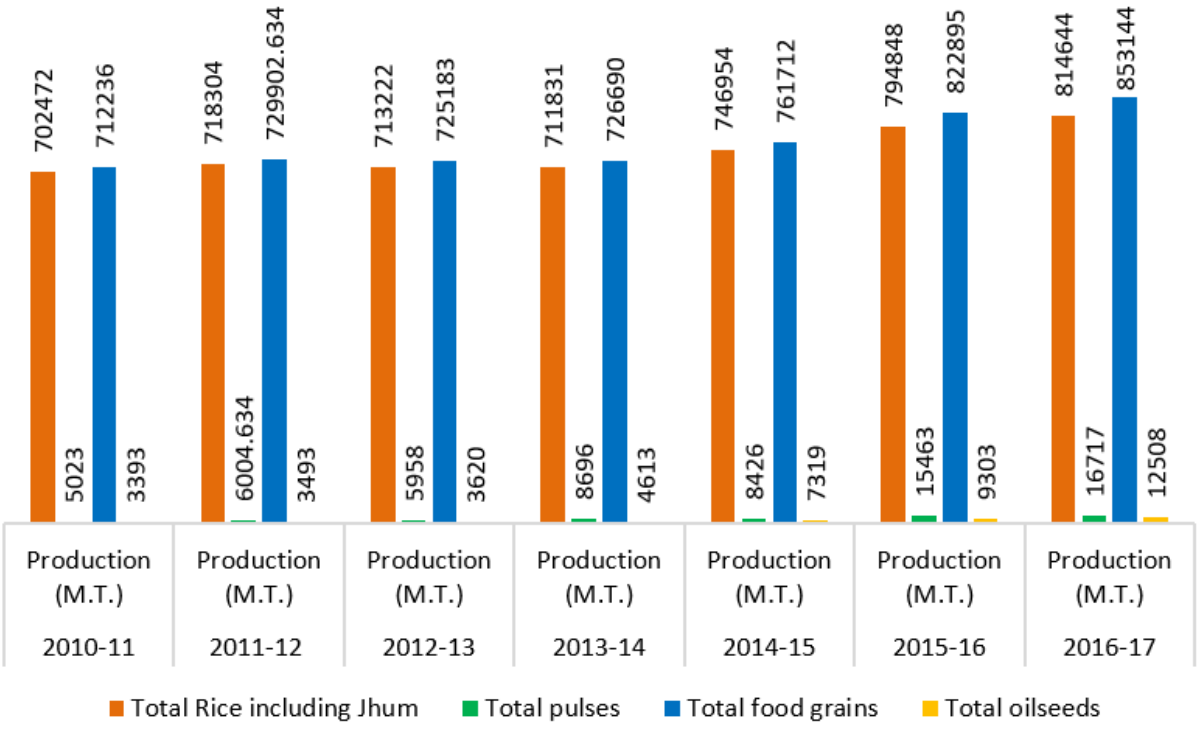

Fig. 2: Production of major crops in the state during 2010-11 to 2016-17

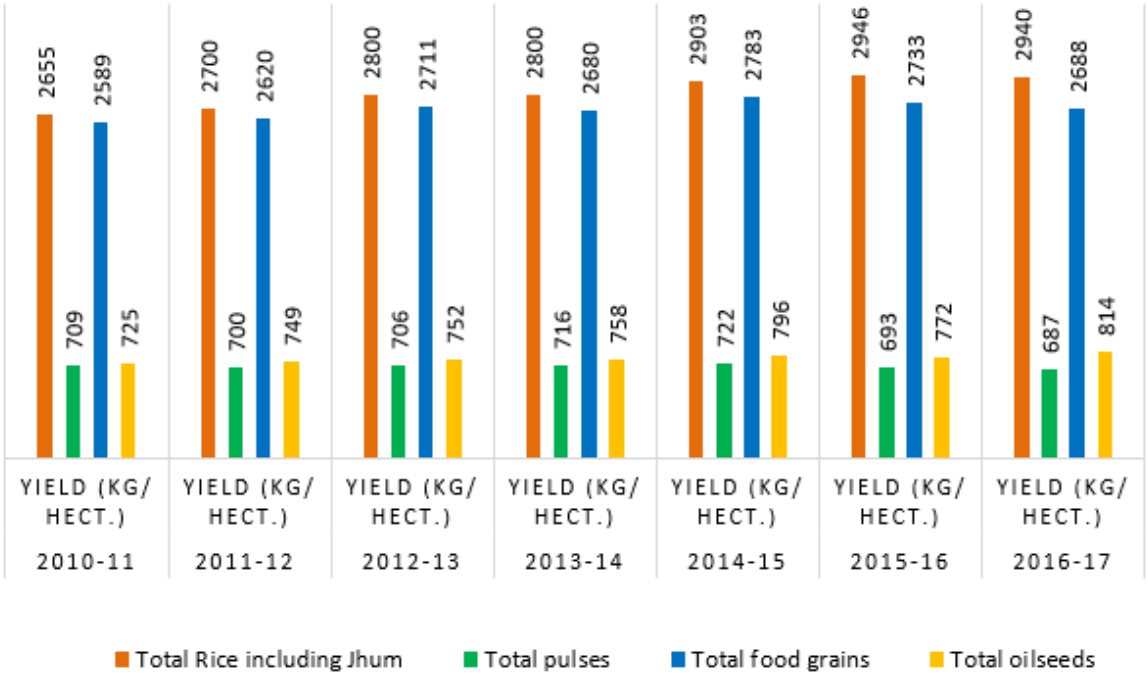

Fig. 3: Productivity of major crops in the state during 2010-11 to 2016-17

3), the state has not seen much changes either in cereals or food grains. Short duration pulses and oilseeds like sesame have been introduced in the state but adoption curve is yet to rise. They are being cultivated in limited areas only with financial assistance under Rashtriya Krishi Vikas Yojana (RKVY), but beyond the financial assistance and constant guidance of the KVKs and state department, they have failed to make any long term change in cropping pattern.

Horticulture

Horticulture sector of the state can be divided into three major crops- vegetables, fruits, and flowers. Status of horticultural crop production and area in the state as well as other North Eastern states is as below (Table 2):

Table 2: Area and production of horticultural crops in North East India (2016-17)

		Arunachal Pradesh	Assam	Mani-pur	Megha-laya	Mizoram	Naga-land	Sikkim	Tripura
Fruits	A	48.71	142.89	50.577	37.37	62.56	39.19	18.553	57.84
	P	124.38	2024.84	478.765	426.86	339.05	388.49	25.563	559.92
Vegeta-bles	A	1.75	300.75	59.398	49.50	37.02	47.17	25.536	46.68
	P	14.42	3329.58	396.864	523.42	179.88	564.62	190.719	817.94
Planta-tion	A	0.07	91.33	0.90	25.52	11.90	1.36	0.00	13.56
	P	0.10	177.72	0.32	32.96	7.38	4.68	0.00	35.60
Aromatic and me-dicinal	A	0.46	4.43	0.00	0.00	0.93	0.11	0.00	0.00
	P	0.99	0.17	0.00	0.00	0.90	0.49	0.00	0.00
Flowers	A	0.02	5.03	0.08	0.01	0.20	0.05	0.24	0.00
	P (L)	0.01	33.76	0.05	0.00	0.46	0.02	16.60	0.00
	P (C)	0.07	55.60	0.24	0.33	0.00	6.18	0.09	0.00
Spices	A	11.44	119.99	10.47	18.61	24.81	15.69	32.25	5.69
	P	68.72	291.30	23.14	0.20	97.20	105.00	66.58	18.04
Honey	P	-	1.00	-	0.20	0.15	0.45	0.35	-
TOTAL	**A**	**62.46**	**664.42**	**121.43**	**131.01**	**137.42**	**103.57**	**76.58**	**123.77**
	P	**208.70**	**5913.97**	**872.39**	**1075.93**	**625.02**	**1069.92**	**299.80**	**1431.50**

(Source: National Horticulture Board, 2017 (Note: A = Area in '000 ha; P = Production in '000 MT; L = Loose flower; C = Cut flower)

Fruits and vegetables occupy 46.20 percent and 53.80 percent of the total area under horticulture in the state respectively. Major fruits and vegetable grown in the state are as below (Table 3):

Table 3: Major fruits and vegetables grown in Tripura

Sl. No.	Potential Horticultural Crops Grown	Districts/Areas
1	Pineapple	All districts of State but mainly North (Nalkata, Kanchanchera, Nepaltila, Darchar, Betchera) and West (Kamramgatali, Sheel-ghati, Mohan Bhog, Jumerdhepa, Baidagi Bazar) districts
2	Jackfruit and Litchi	All districts of State
3	Orange	North and Dhalai District
4	Banana	West and South Districts

5	Potato	South and West Districts
6	Tomato	West District
7	Cauliflower and cabbage	West, South and North District
8	Ginger	South and North District
9	Turmeric	South District

(Source: SFAC, 2012)

Vegetable cultivation in the state is still not at a large scale and major part of it is imported from Assam, West Bengal, partly from Meghalaya and some other southern states like Karnataka and Andhra Pradesh. Winter vegetables like cauliflower, cabbage, peas, potatoes, and chilli are the major crops while in summer, brinjal, cucurbits (pumpkin, cucumber, gourds, and watermelon), colocasia, etc. are majorly grown. Irrigation being a problem in most part of the state, only river banks and areas covered under irrigation channels, pumps, etc. are mainly under vegetable cultivation, especially in winter. Average productivity of summer vegetables in the state is 14.96 MT/ha and for winter vegetables it is 19.85 MT/ha. Availability of locally produced vegetables in the state is just above current demand and recommended consumption (recommended consumption amount is 400 gms/day, available amount of vegetables in the state at current production and population is 732 gms/day), so surplus is rarely available. Moreover, with seasonal variations, climatic fluctuations, and other unpredictable reasons, the availability is not same throughout the year which makes it necessary to import vegetables from the neighboring states. Four Farmer Producer Organizations (FPOs) were formed by the Department of Horticulture with support from Tripura State Agriculture Management and Extension Training Institute (T-SAMETI) – Sabujdeep Vegetable Growers Cooperative Society at Charilam, Bishalgarh; Jagaran Vegetable Growers Cooperative Society at Natunnagar, Agartala; Krishi Unnayan Vegetable Growers at Teliamura; and Krishi o Krishak (Farming and Farmers) at Udaipur, Gomati District – but none of them are functioning right now because of lack of guidance, funds, and collaboration among the members.

Tripura has the potential to be major producers of some high value fruits like Kew and Queen varieties of pineapple, mango, jackfruit, orange (Khasi Mandarin), and litchi. Pineapple in Tripura has long been accepted nationally as of high quality and superior taste. In the 1960s and 1970s, this made it one of the most popular agricultural produce of the state. High importance was placed by Tripura Small Scale Industries as well on pineapple production and processing, exporting it nationally and internationally. But the production magnitude reduced and meanwhile natural rubber production was introduced in the state, which also had high value in the international market. Rubber prices in international market reached an all-time high of Rs. 319.50/kg in February of 2011 and a record low of Rs. 88.86/kg in January of 2016. Rubber prices decreased by Rs. 0.91/kg or 0.82% to Rs. 109.80/kg on May 2 from Rs. 110.71/kg in the previous trading session (Trading Economics, 2018).

Fig. 4: Trend of natural rubber price in international market (JPY/Kg) (Source: Trading Economics, 2018)

But while rubber had a larger gestation period, once the trees started production, it was a long term process with minimum investment, both financially and manually. Naturally, many of the pineapple gardens were replaced with rubber plantations. The ones which couldn't be replaced still produced plenty to surpass the demand of the state, which reduced the prices (Market price of pineapple is Rs. 43/kg while retail price is Rs. 49 – 55/kg). In spite of that, with the current prices of pineapple in the state, the unit cost of investment is Rs 40,936 per 0.4 acre (1 kani), which is affordable for a small farmer. The net income per unit is around Rs 64,664 with 147% return on investment. Considering producers only get 30-40 per cent of the consumer's money, better connectivity with consumers and reducing market intermediaries will greatly increase the economic benefits of pineapple cultivation in Tripura (MART, 2011). Lack of processing facilities or export initiatives resulted in wastage of huge quantity of pineapples in the state every year. With fall in rubber prices in the international markets, there has been a new found interest in pineapple production, processing, and export in the state. Presently, 8,848 ha area is under pineapple production with 128,971 MT yield (14.43 MT/ha is the average productivity). But as of now, there are no processing facilities in the state, so, increase in production without proper market or cold storage infrastructure will result in distress sale of the surplus (currently the wastage is up to 30 %), resulting in a more significant dip in interest of the growers to take up pineapple production. In the recent times, climate change is also adding to the woes of the pineapple farmers (Business Standard, 2016). Tripura has been notified as an Agri Export Zone (AEZ) for pineapple but except recent exports of few consignments to Dubai, the export to Bangladesh is also at standstill aggravating the market glut.

Another potential crop in the state is jackfruit. Tripura has a rich growth of jackfruit plantations with highly favorable climatic conditions. But similar to pineapples, this crop is also mostly a wasted potential in the state.

Table 4: Production status of jackfruit in India in 10 major producing states (2015-16)

Sl. No.	State	Production (MT)	Share of total production (%)
1	Tripura	291,590	16.84
2	Orissa	232,790	13.44
3	Assam	197,200	11.39

4	West Bengal	196,760	11.36
5	Karnataka	193,470	11.17
6	Kerala	190,140	10.98
7	Chhattisgarh	183,230	10.58
8	Jharkhand	117,460	6.78
9	Madhya Pradesh	53,090	3.07
10	Tamil Nadu	49,730	2.87

(Source: APEDA, 2018a)

> "There used to be a lot of jackfruit trees in the village even a few years back and the productions were huge as well. But because there are no markets and it was way more than can be consumed in the village or used as animal feed, many of us are now cutting down the trees. It will be very helpful if some training on processing of jackfruit can be given to us or facilitate export to other states. We can earn a lot from jackfruits alone."
>
> *- Sadhan Chandra Paul, Farmer, Laxmibill, Bishalgarh, West Tripura (January, 2018)*

As of 2016-17, around 6,096 ha area in under jackfruit cultivation with a production of 150,117 MT (average productivity of 24.63 MT/ha) while in 2009-10, the area and production were 8,645.00 ha and 256,280 MT respectively (DoH, n.d). Both area and production of this high value fruit in the state is decreasing every year because of the huge wastage and lack of market, storage, or processing facilities. Considering most of the production is without much effort and is much higher than the demand, many producers don't bother taking them in the market at all because of the transportation cost involved. The benefits of jackfruit are multidimensional - jackfruit trees being stress resistant, chances of crop failure is minimum to nil; the fruit can be used as both fruit (when ripe) and vegetable (when unripe); the seeds can be cooked too, and both fruit and seeds are highly nutritious; the leaves make good cattle feed; the roots and leaves are also used for their medicinal properties; the timber is quite expensive and is used for making furniture and musical instruments. Around 2,000 crore worth of jackfruit is wasted in India annually (Suchitra, 2015), of which the share of Tripura is considerably high, which could instead provide food and livelihood to the rural populace of the state.

India and China accounts for 91 per cent of the world litchi production while accounting for 1 per cent of the total area under the fruit in the country. Tripura has a special significance in litchi production and export in the country both in terms of market arrival (litchi maturity in our country starts from Tripura) and organic litchi production (AERC, 2015). But over the years, production and productivity is declining in spite of increasing area, though in small proportions only. Litchi production in the state has decreased in the last few years owing to lack of attention to the litchi gardens in the state that has been ailing for years. Individual producers get high price for litchi during the peak season as there

is a large demand for the fruit both fresh and processed. During March to September, 2017, a total of 20 shipments worth USD 512,071.35 was imported from Bangladesh, the sole importer of litchi to Tripura. India exported Litchi worth USD 44,341.46. Nepal is one of the largest buyers of Litchi from India, accounting for exports worth USD 40,630.00. The other big buyers of Litchi are Singapore and South Africa which bought Litchi worth USD 1,438.93 and USD 1,250.00 respectively during March to September, 2017 (Infodrive India, 2018). PRAN Group of Bangladesh has also set up a plant at Tripura in 2015 with targeted investment of USD 30 million to manufacture juices, drinks (with special focus on Litchi), mineral water, bakery, carbonated beverages, snacks, culinary and confectionery items, biscuits and dairy products produced at the factory to be imported to 114 countries (Business Standards, 2015).

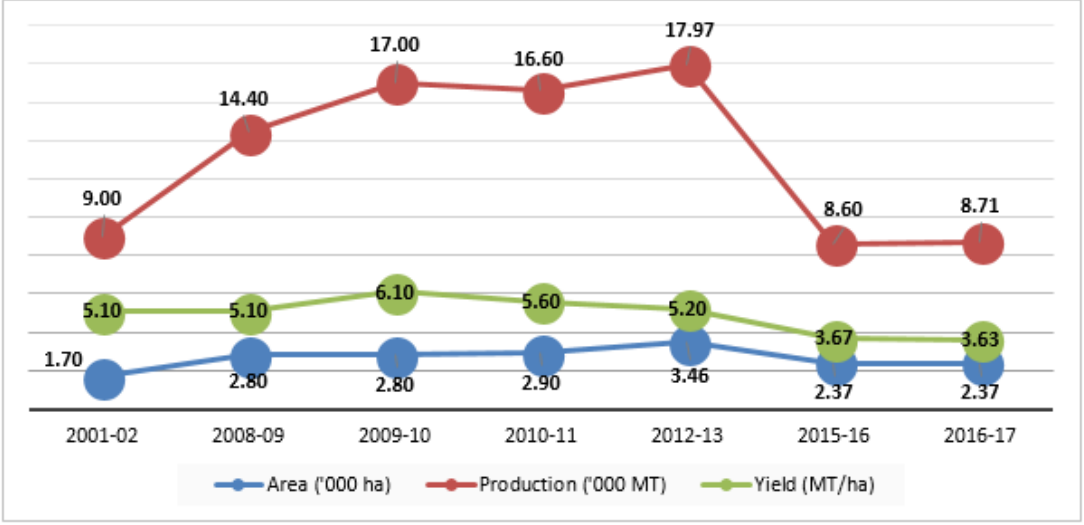

Fig. 5: Trends in area, production, and productivity of Litchi in Tripura (Source: APEDA, 2018b; DoH, n.d.)

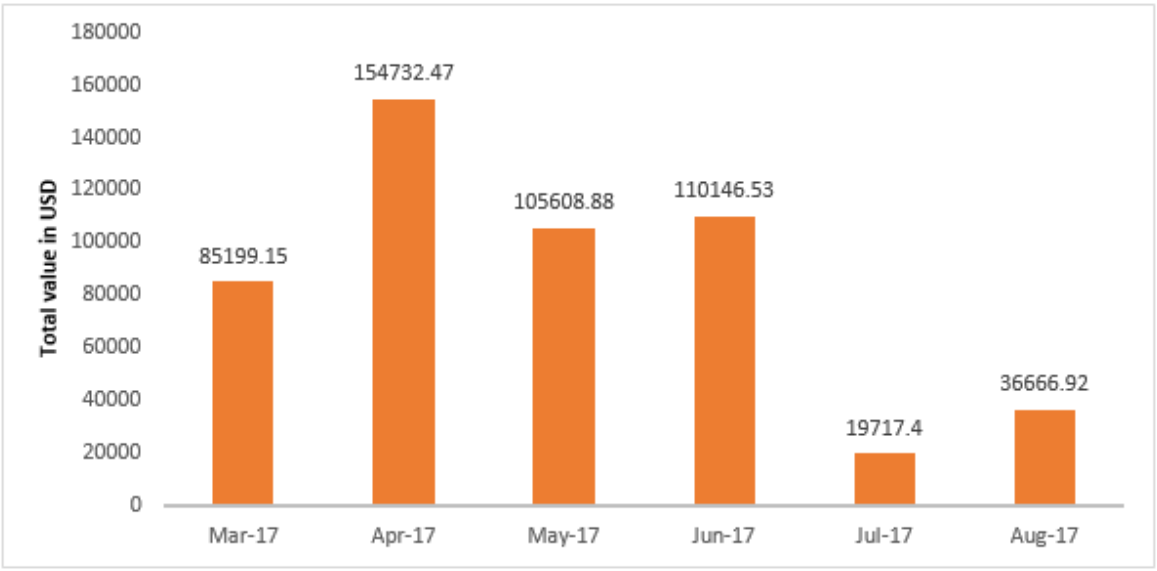

Fig. 6: Value of Litchi import shipments in India during March to September, 2017 (Source: Infodrive India, 2018)

With highly favorable conditions in the state for production of litchi, jackfruit, mango and other high value crops, there is a high need for taking advantage of the strengths available to provide income and employment to the people of the state as well as earn foreign currency from exports.

Floriculture in the state is in its nascent stage as well. At present, about 290 ha area is under commercial cultivation of flower with production of 580 MT with a productivity level of 2 MT/ha both under open and protected condition (Tripurainfo.com, 2018). Flowers like Anthurium, Gerbera, orchids (mainly Dendrobium), Marigold, Rose, and Tuberose are the most commonly grown flowers in the state.

Major support for floriculture comes under two sub-components of Mission on Integrated Development of Horticulture (MIDH) Scheme – Horticulture Mission for North East and Himalayan States (HMNEH) and NBM (National Bamboo Mission). Laxmibill village in West Tripura has made its own place in the state in floriculture, especially with Govt. assistance under these schemes where green-houses were constructed by the Govt. for the farmers and planting materials for Anthurim, Gerbera, and Dendrobium orchids were provided for free under Technology Mission. Installation of sprinklers and free maintenance of the Green Houses were also provided by the Govt. This assistance has made the farmers interested in flower cultivation, and made Laxmibill village one of the largest supplier of flowers throughout the state.

Fig. 7: Flower producer Mr. Sadhan Chandra Paul in his Green House at Laxmibill, West Tripura, growing Dendrobium orchids and Anthurium

Fisheries

Fisheries sector is one of the most economic sectors of the state, with fish being a staple and of high demand. While the state does not have any marine or brackish water resources, inland fisheries is the only source of fish cultivation. With more than 95 percent of the population eating fish, the demand is huge. Perspective Plan of 2003-04 aimed at increasing fish production to attain self-sufficiency and put the target at 13 kg/head/year by 2012 (WHO has recommended consumption of 11 kg/

head/year). By 2014-15, the production has attained 17.5 kg/ha/year with approximate production of 65,000 MT but demand exists at around 75,000 MT or of 22 kg/head/year. Around 86 percent of the state's fish requirement is met by the state's own production and the rest is imported from Andhra Pradesh, West Bengal, and Bangladesh (DoA, n.d). Fish farming mostly takes place in own ponds of the fish farmers, leased ponds and lakes from Public Works Department, and streams and rivers in the state. Artificial hatcheries are also constructed across the state, mostly with financial support from the Government.

Fig. 8: Maharajganj Fish Market, Agartala

Fish market in the state is mostly unorganized and there is no marketing department either to oversee the market related aspects in the fisheries sector of the state. Maharajganj Bazaar at Agartala is the largest fish market, while Battala (also at Agartala) and Udaipur are the major fingerling markets in the state. Fish caught by the fishermen are either brought by themselves to Agartala or sold to middlemen at farm gate depending on the quantity, and are auctioned to the retailers/wholesalers at Maharajganj Bazaar, from where it is supplied to different parts of the state. Approximate price of fish in the state are as follows:

Table 5: Price of fish in Tripura

Origin	2018		2010	
	Wholesaler to Retailer (per kg)	Retailer to consumer (per kg)	Wholesaler to Retailer (per kg)	Retailer to consumer (per kg)
Andhra Pradesh				
Rohu	Rs. 120-150	Rs. 180-200	Rs. 80–90	Rs. 100 –120
Catla	Rs. 140-180	Rs. 200-250	Rs. 90-100	Rs. 120-140

West Bengal				
Rohu	Rs. 130-150	Rs. 180-200	Rs. 100 -120	Rs. 130-160
Catla	Rs. 180-220	Rs. 250-300	Rs. 100-130	Rs. 130-170
Bangladesh				
Rohu	Rs. 100-150	Rs. 180-200	Rs. 110-130	Rs. 140-160
Catla	Rs. 140-160	Rs. 200-250	Rs. 120-140	Rs. 140-180
Hilsa	Rs. 800-1000	Rs. 1200-1500	Rs. 250-300	Rs. 300-400
Small fish	Rs. 200-250	Rs. 300-600	Rs. 100-150	Rs. 120-200
Local (Tripura) (small size)				
Rahu	Rs. 150-180	Rs. 200-250	Rs. 120-150	Rs. 140-200
Catla	Rs. 180-220	Rs. 250-300	Rs. 120-170	Rs. 140-250
Brigette/Silver Carp	Rs. 100-150	Rs. 180-200	Rs. 50-90	Rs. 60-120
Singhi/Magur(live)	Rs. 500-600	Rs. 600-700	Rs. 400-500	Rs. 500-700
Small fish (Gulsa, Kai, Puties etc.)	Rs. 300-350	Rs. 400-600	Rs. 100-200	Rs. 120-300

(Source: Field data; MART, 2011)

The Fisheries Department also has its own farm ponds at Amarpur, Udaipur, Shantirbazaar, Sabroom, Teliamura, Gandacherra, and Kumarghat. Fishes are sold directly to the consumers and fingerlings are supplied to the fish farmers for free or at subsidized rates. From the Government perspective, sole focus is on increasing production of fish in the state through introduction and refinement of technologies related to artificial culture of high value fish like Fresh Water Prawn (Tiger Prawn) and Pabda (*Ompok bimaculatu*), while market is still out of focus. Major role in fish marketing is undertaken by Tripura Matsyajibi Samabay Samiti (Tripura Fishermen Cooperative Society).

The society regulates both wholesale and retail selling of fish in the state in an organized manner. The association is financially well organized as well and frequently looks after social development of the members. Special efforts by the State Government for construction of market yards across the state for selling of fish with running water and well maintained sanitary conditions have increased the ease of selling fish in the state and brought in more customers as well. There is also high demand for processed fish in the state, of which only a small amount is processed within the state but for the major part is imported from Bangladesh (*shidal*/fermented fish) and Gujarat (dry fish). Part of the *shidal* is also exported to Manipur and Mizoram, but mostly is consumed within. As both processing and export are being done by producers at cottage level across the state and no record is maintained, data regarding value and quantity was not available on or off record.

Fig. 9: Dry and fermented fish market at Maharajganj Bazaar, Agartala

Fig. 10: Fish fermentation unit at Agartala

Animal resource

Major products in the animal resource sector is milk, meat (poultry, chevon, and pork), and egg. Current status of livestock population in the state according to Integrated Sample Survey 2016-17 (provisional) is as below:

Table 6: Livestock population of Tripura as per ISS 2016-17 (provisional)

Cattle	Buffa-lo	Sheep	Goat	Pig			Fowl			Duck		
				Imp Pig	Desi Pig	Total	Desi Fowl	Imp Fowl	Total Fowl	Desi Duck	Imp Duck	Total Duck
988004	11641	3162	659370	234116	160601	394717	3384026	1709326	5093352	914214	182951	1097165

Major initiatives of the department in the milk, meat, and egg sector are as folows:

Table 7: Major activities of ARDD sector

Sector	Activities
Milk	• Intensification of AI to increase crossbred population • Setting up of diary demonstration units • Subsidised growth meal, feed, etc. • Health camps, fertility camps, etc. for cattle • Setting up of mini dairy through credit link bank loan • Increasing the number of door step A.I. worker and incentivizing them • Cultivation of perennial fodder and Azolla for reducing feed cost and augmentation of milk production • Insurance of milch cattle
Meat	• Setting up pig breeding units
Egg	• Promotion of backyard poultry • Financial assistance in establishment of brooder house

(Source: ARDD, 2017, 2016, 2015, 2014)

The focus has been the same since 2014-15 till date and except the numbers, nothing much has changed in the plans. Budget provision of the department also focuses on Tripura Livestock Development Agency (TLA) and other administrative and construction activities. Budget documents or Annual Plans have no mention of market or value chain.

Through interactions with veterinary officers, livestock farmers, and diary unions, it is understood that the public sector plays very limited role in animal resource development and value chain in the state, in spite of it being one of the most important and valued sector in the state. The department runs four poultry farms in the state, from which day old chicks are distributed to individual farmers and beneficiary-run brooder houses constructed by the Govt. There are currently 129 such brooder houses in the state, of which 79 are functional. The beneficiaries are also provided subsidized feeds, feeder, waterer, and other necessary equipment. From the brooder houses, 15-20 days old chicks are sold to farmers. The males are sold for meat purpose, while the female are reared for eggs. Most of the farmers in the rural areas rear backyard poultry and generally the marketed surplus is the one left after home consumption. Around 160-170 million eggs are imported from Karnataka and Himachal Pradesh per year to meet the existing demand of 100 eggs/capita/year. For meat, the state is self-sufficient in production and all the meat is consumed locally.

Milk availability in the state currently (2017-18) is 115 gm/day/person while the national availability is 300 gm/day/person. Under the Perspective Plan, per capita milk availability has increased from 67 gm/day/person in 2003-04 but still the scope of development is fairly wide. The milk sector gets major focus from the Government front as well to attain self-sufficiency as it has contributed 30.59 percent of the total output value of the livestock sector in Tripura in the year 2016-17 with the current market price of Rs. 49-50/lts. In infrastructural terms, there are 3 milk plants and one chilling

station in the state. Cooperative sector in milk is one of the strongest in the state with currently two societies – Gomati Cooperative Milk Producers' Union Limited (GCMPUL) at West Tripura and Uttarayan Cooperative Milk Producers' Union Limited (UCMPUL) at North Tripura – and 56 and three functional milk procurement cooperative societies registered under them respectively. Marketing of milk happens through three channels – door to door by the milk producers, procurement through cooperative societies, and in open markets. Major processing of milk is done by GCMPUL and local sweet shops across the state.

Table 8: Major Livestock Products (MLP) during 2012-13 to 2016-17 in Tripura

Year	MLP	Target	Achieved	Per Capita Availability
2012-13	Milk (in MT)	1,16,000	1,18,042.00	84.00 gm/day
	Egg (in crore)	21.00	15.65	42 Nos./year
	Meat (in MT)	34,000	31,793	8.53 Kg/Year
2013-14	Milk (in MT)	1,21,259	1,29,700.00	94.01 gm/day
	Egg (in crore)	18.63	17.94	48 Nos./year
	Meat (in MT)	29,025	33168	8.77 Kg/Year
2014-15	Milk (in MT)	1,41,373.00	1,41,430.00	101.00 gm/day
	Egg (in crore)	20.45	19.79	52 Nos. /Year
	Meat (in MT)	35,158.00	34,815.00	9.08 Kg/Year
2015-16	Milk (in MT)	1,67,965	1,52,227.42	106.87 gm/day
	Egg (in crore)	25.21	21.61	55.52 Nos. /Year
	Meat (in MT)	39,503	37,353.88	9.59 Kg/Year
2016-17	Milk (in MT)	1,67,965	1,58,715.72	113.03 gm/day
	Egg (in crore)	26.58	22.94	59.63 Nos./Year
	Meat (in MT)	39,504	39,685.33	10.32 Kg/Year

(Source: ARDD, Govt. of Tripura)

Harbouring the White Revolution: Gomati Cooperative Milk Producers' Union Limited (GCMPUL)

Gomati Cooperative Milk Producers' Union Limited, established following the AMUL model of diary cooperative, is the largest milk producers union in the state. The Cooperative society was registered under Societies Act on 2nd March, 1982. GCMPUL is governed by a Board of Directors with a term of three years. Six Director are selected by voting and two are nominated by the State Government. The Cooperative Union has 56 functional societies and 5868 active members at present from West Tripura, Khowai, Sipahijala, Gomati, and parts of South Tripura district.

Mode of operation: GCMPUL starts its activities in a new areas by identification of area and assessment of production and distance from the processing unit at Indranagar, Agartala. If found suitable for

procurement and min 50-100 lts of milk are readily available, a village level meeting of milk producers is conducted. On aggreement, a village level executive body is selected and manage is appointed by the producers. Autonomous village level cooperative dairy society is formed and are connected withalready existing milk procurement network. Quality of milk is tested at the collected centres with automated machines and the fat ad SNF quantity are recorded. The milk collected at the procurement centre is brought to the processing plant and is again tested for adulteration before accepting. In case the milk is spoilt due t delay in arrival, the vehicle owner pays for the loss and in case the milkreaches on time but us found spoilt in the container, the society pays for the loss. The Union transfers the money to the society at in 10 days interval and the soiety disburses the amount to individual farmers based on the records kept. The society piece of milk is Rs. 2-3/lt higher than the producer's price.

Fig. 11: Paneer preparation at GCMPUL

The society and the Union provides the member producers required extension services, subsidised inputs and balanced feeds, veterinary services, first aid and subsidised medicines. Other than that, there is also managerial subsidy for the society activities, and incentives and bonuses whenever available.

Products: The processing plant has a capacity of 24,000 lts per day. Major products of the Coopeative Union are milk (Toned, Slim, and Gold), paneer (Indian Cottage cheese), glee, ice cream, and sweet curd.

Marketing: Processed products are sent to the doorstep of around 350 agents by Agartala Diary against advance payment. GCMPUL does not have its own outlet for selling the products but does through the retail agents. Products of the Cooperative Union are sold across the state.

Performance: The table below lists the performance of GCMPUL during the year 2016-17

Sl. No.	Particulars	Unit	Achievement (2016-17)
1	Procurement of milk from: i) Milk Producers Co – Op Societies ii) Government Farm	Kg Kg	18,21,027.37 78,906.76
2	Marketing of Milk	Lts	41,57,096.40
3	Ghee sold	Kg	1,235.10
4	Paneer sold	Kg	15,748.00
5	Ice Cream sold	Lts	1,587.08
6	Misty Doi (sweet curd) sold	Kg	15,599.20
7	New Society organized	Nos.	-

8	No. of MPCS function	Nos.	99
9	No. of farmers members	Nos.	5867
10	Supply of milch Ration	MT	1,803.68
11	Training of milk Producers	Nos.	225
12	Distribution of Crossbred Heifers	Nos.	-
13	Others	Nos.	1 (Capacity 2000L)

Market and Value Chain

Tripura has been classified by Indian Council of Agricultural Research (ICAR) under Agro-Cilmatic zone of Humid Eastern Himalayan Region. Most of the state is under forest cover with only 27 percent of land available for agricultural activities. According to classification of terrain, the land of this state is divided into 5 (five) major groups, which are reflected in the following table:

Table 10: Classification of land in Tripura

Sl. No	Category	Area in Sq. Km.	% area to total geographical area
1	Highland area	4,000	38.00
2	Tilla land with moderate steep slopes	1,600	15.00
3	Tilla land with gentle to moderate slopes	700	06.70
4	Rolling topography	2,149	20.50
5	Plain land	2,042	19.80
	Total geographical area	**10,491**	**100**

Average land holding in the state is 0.49 ha and cropping intensity stood at 198 percent during 2014-15. Tripura has 555 rural markets, 30 urban markets and 21 regulated market for agricultural commodities. However, the accessibility to these markets is limited and in all 53 percent markets are accessible in all-weather by road. Department of Agriculture is looking after the development of the agricultural markets, while the respective Panchayats look after the management of primary markets and rural haats. Infrastructure availability in villages and their accessibility is discussed below:

Table 11: Infrastructure and support service availability in Tripura

Infrastructure and support services	Availability within village (%)	Availability in nearby location (%)	Distance travelled to access services (in km)
Road	100	-	-
Electricity	100	-	-
Telephone	100	-	-
Transport	100	-	-
Drinking water	100	-	-
School building	90	10	2-5
Post office	80	20	2-12
Community building	80	20	-
Rice mill	80	20	2-4
Weekly market (Haat)	70	30	2-4
Irrigation (Dug wells)	60	-	-
Veterinary services	60	40	2-12
Market yard	20	80	2-10

Nursery	20	80	2-12
Skill training centre	20	80	2-12
Bank	10	90	2-12
Oil expeller	10	90	6-12
Cold storage	0	100	2-55

(Source: MART, 2011)

Return on investment (RoI) in cash crop cultivation has much higher benefits compared to food crops, as illustrated in the following table:

Table 12: Economics of investment in allied sector

	Input cost (Rs.)/0.4 acre	Production (kg)	Rate/ kg	In-come	Net in-come	RoI (%)
Pineapple plantation	40,936	17,600	6	64,664	62,976	147
Floriculture(Tuberose)	33,155	3,200	25	46,844	45,160	125
Fisheries	62,326	345	250	87,937	25,611	41

(Source: MART, 2011; Field data)

Value chain in Agricultural crops

In a situation where there is hardly a market surplus in any of the agricultural crops to create a value chain, the major characteristics of the value chain in agricultural crops are as discussed below:

- Productivity of most of the agricultural crops are still low to form a proper value chain.
- Majority of the crops are sold at farm gate to the middlemen or in local markets by the producers at low price.
- There is little to no initiative in farmer aggregation for value addition or marketing of the major crops.
- Processing and value addition is also very limited due to limited production.
- There is no proper market data available in the state. Information about market demand, procurement, and consumption are arbitrary, and not available with the state department. Import and export data is also not available with the state department.
- Agricultural Marketing Department is manned by very limited staff, which limits their capacity as well and this reflects in non-availability and required analysis of market related data.

Fig. 13: Vegetable market at Battala

Value chain in vegetables

- Vegetables, like cereals and food grains, are mostly sold at farm gates to the middlemen. A very limited quantity is also sold by individual farmers/farm women at railway stations,

weekly village markets, and so on, mostly for instant cash. As individually produced amount is very less, farmers do not prefer to bring them to the major markets in the state as transportation costs are mostly high.

- The middlemen collect vegetables from the farm gates and transport them to the major markets in different districts of the state.
- The private middlemen also export vegetables to some neighboring states like Assam and Mizoram. Information about quantity or value of produce exported is not available with the Government. Similar is the situation with imported vegetables as well.

Value chain in fruits

As discussed, the possibilities in fruits value chain are immense with many high value fruits being grown in the state. Major characteristics of value chain in fruits are:

- Fruits like pineapple are mostly sold within the state at low rates. Farmers prefer to sell them to middlemen for the same reasons as the price obtained does not justify incurring the transportation costs.
- Most of the produce is sold within the state. Some private businessmen export them to neighboring states, but records of amounts do not exist.
- Pineapple exports to Bangladesh have been stopped for past few years which has hit the pineapple growers. Agricultural and Processed Food Products Export Development Authority (APEDA) has exported two consignments (1.05 MT each) of Kew variety of pineapple to Dubai in 2017 and based on the positive feedback and high demand, agreements for more are also underway (Silchar.com, 2018)
- There is a demand for processed products like jam, jelly, juices but processing facilities does not exist in the state. Training programmes are conducted for farm women on processing technologies at cottage scale for preparation of pickles, jam, jelly, marmalade, juice, etc. from locally available fruits (mango, pineapple, jackfruit, lime, etc.) and vegetables (carrot, raw

Fig. 14: List and price of various pickles prepared at cottage level by women SHGs and sold at SARAS Fair 2018 at Agartala

Fig. 15: Members of Ganga Self Help Group in their stall at SARAS Fair selling pickles

jackfruit,chilli, brinjal, bamboo shoot, etc.) but as facilities for proper processing are non-existent, the quality remains low. Also, in absence of quality control and nutrition check of the processed products, getting them certified or selling outside the state is also difficult. There has also been minimal to no collaboration with Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Welfare, Guwahati Regional Office for North East India for better quality control and marketing.

- Under National Rural Livelihood Mission, small scale fruit processing units have been established at village level involving women SHGs. The products (pickles, jam, jelly, marmalade, juice, etc.) are mostly sold during fairs, etc. and also exported to states like Gujarat, Maharashtra, Karnataka etc. through personal networks.
- Major chunk of the pineapple, jackfruit, and vegetables grown in the state are sent to Bangladesh through unofficial channels (SFAC, 2012).

Value chain in flowers

- This is dominated by middlemen as well. Since most of the producers are marginal farmers, quantity of flower produced is generally less and so they prefer to sell them to middlemen to save on transportation cost.
- Flowers are sold in private shops mostly. Majority of the produce sold in the state are imported from Assam, West Bengal, Delhi, and Karnataka.
- Few private traders in the state has explored the possibility of export to other states like Delhi, West Bengal, and Karnataka but since the production quantity in the state is too low (according to GoI data it is nil as mentioned in Table 2) to qualify for it, the orders were cancelled. Anthurium, though, has been exported to these states a few times.
- Ornamental plants and nurseries, mostly private, also cater to the state demands. The plants are also generally imported from neighbouring states of Assam, West Bengal, and sometimes Karnataka.

Value chain in Fisheries

- Value chain in fisheries sector is mostly unorganized. Tripura Fishermen's Cooperative Society plays an important role in the value chain in fishery. They regulate the auctions of fish in major markets of the state, regulates price of fish in the markets to some extent, advocates for rights of fishermen, and help BPL fishermen to get benefits through Government schemes and programmes.
- Small and marginal fish farmers prefer to sell fish at farm gate to the middlemen, who, in turn, sell it to wholesalers at generally 5% commission. The middlemen auction the fishes (both local and imported) at Maharajganj Market from where it is distributed throughout the state.
- Large quantity of fish is imported from Bangladesh through International Trade Agreements between India and Bangladesh. A major quantity consumed in the state also comes from West Bengal (As the DoF was not able to give the data on the exact quantity and species of fish imported to and exported from the state, the same could not be furnished here).
- High value fish like Giant Fresh Water Prawn and Hilsa is high but production technology is yet to

be perfected, which makes them very high priced commodity in the state.

- Ornamental fish is also seeing increased demand in the state. There are many private pet stores that import and sell them at high price. Department of Fisheries has one hatchery for ornamental fish that grows Gold Fish, Angel Fish, and Black Fish, but in very less quantity to serve the demand of the state.

Value Chain in milk

Value chain in milk is much more organized compared to other sectors in the state, mostly because of the milk cooperative societies. There is a high demand in the state for milk and milk products and the characteristics of value chain in milk is as follows:

- Milk is sold at unorganized market by the livestock farmers. Bishalgarh has one of the largest open market for milk in the state.
- Door to door selling is also very common as the price (Rs. 60/lt) is higher compared to open market (Rs. 52-55/lt) or cooperative societies (Rs. 48-50/lt). Producers also sell to sweet shops which have high demand for milk for making processed products like curd, and sweets.
- Cooperative milk unions collect milk through cooperative societies formed by the Union at different parts of the state. But because of lack of proper transportation facilities for quality preservation in milk, the unions at present don't function beyond 50-100 kms.
- Processed milk products are produced and sold by sweet shops and GCMPUL. GCMPUL sells their products through the retailers across the state. Sweet shops generally directly sell them to consumers.
- A special milk delicacy that has high demand within the state and in neighboring states like Assam is the *peda* produced at Gomati district. Special initiative to package and export them could be highly economical to the producers. But limited milk production is also a constraint in producing it in large enough quantities.

Value chain in meat

The meat sector too is highly unorganized and unregulated. Poultry, chevon, and pork are the most consumed meat in the state.

- Poultry reared for meat purpose by individual farmers are either sold to middlemen or brought to the market by themselves. As the selling is mostly unofficial, data about the amount of meat being sold is not available.
- Chevon and pork are individually sold by the farmers themselves or private sellers who buy the livestock from the farmers

Fig. 16: Poultry market at Ambassa, Dhalai District

for meat purpose. The value chain is unorganized as well and there is no regulation in terms of price. Depending on demands, the price and availability varies.

- Government intervention is only in market yard construction for maintaining hygienic conditions and cleanliness in slaughter houses and selling yards.

Fig. 17: Stall for processed food by Srinkhala Self Help Group from Kakraban, Gomati Tripura at SARAS Fair, 2018

Value chain in egg

Eggs sold in the state are procured from two sources – local producers and imported eggs through private/unofficial channels.

- Local eggs, when available in large quantity, are sold to wholesalers or middlemen. In case the quantity is less, the producers sell it themselves locally.
- The imported eggs are generally bought by wholesalers who either directly sell them or sell them to retailers in 5-20 percent profit.

Major issues in value chain development in Tripura

An organized value chain system does not exist in Tripura yet. The state is yet to become self-sufficient in majority of the agricultural produce, and in such a condition, the focus of policy and extension is still on increased production and productivity. With marginal farmers dominating the agricultural scenario and rural population dependent on subsidies, there are multiple factors that need to be taken into account before emphasizing on particular policy recommendations.

1. Producer aggregates: Line department and NABARD in the state has worked on creating producer aggregates in the form of Self Help Groups, Producer Organizations, Producer Associations, Farmers' Clubs, etc. but nothing could stick so far. In horticulture, Flower Producer Organizations and Vegetable Growers Associations were formed but disbanded as soon as the push from supporting organizations shifted away. Leadership development, conflict management, cooperation and collaboration completely failed and as a result, it was practically impossible for any of the aggregates to hold together. Same is the condition in Fisheries as well. A total of 37 fishermen aggregates were formed by the Fisheries Department, of which none are functional at the moment. Almost similar is the condition in the cooperative societies with administrative control under organizations other than the Government.

Table 13: Synopsis of Cooperative Societies (Administrative control by non-Govt. agencies)

Sl. No.	Categories	No.	Elections held	Audit held	Profit	Loss
1	Fisheries Coop. Societies	159	89	94	44	50
2	Handloom Coop. Societies	244	86	98	47	51
3	Tea Plantation Coop. Societies	33	11	13	7	6
4	Milk Coop. Societies	116	19	24	15	9
5	Farming Coop. Societies	33	05	09	8	1
6	Piggery Coop. Societies	22	12	02	1	1
7	Poultry Coop. Societies	12	Dormant	Nil	Nil	Nil
8	Forest Coop. Societies	7	Dormant	Nil	Nil	Nil
	Total	**626**	**212**	**240**	**122**	**118**

(Source: Department of Fisheries, Govt. of Tripura)

Within the groups, power dynamics becomes a major issue. Also, members mostly want monetary benefits which take time to come. With poor economic conditions in most of the rural households, distress sell is very common, which further dilutes the purpose of aggregates. Economic condition of the people and their motivation decides the success of development initiatives. Economic poverty and contentment with minimum facilities makes the efforts much harder to work with in Tripura.

Development through Collectivization: Bagma Agri Producers' Development Trust

Bagma Agri Producers' Development Trust is the first and only FPO in Tripura. It was initiated as a Farmers' Club in 2005. In later years, with assistance from POPI TRIBAC, it was registered under Indian Trust Act and attained the status of an FPO. Mr. Sudip Majumdar is the present CEO of the FPO with more than 200 members at present.

Fig.: Sale of various products by members of the FPO at their stall in SARAS Fair, 2018

Activities: the FPO deals in diverse activities as the members are engaged in multitude activities. The major activities of the FPO are:

- Assistance in entrepreneurial capacity development in members
- Help members in development of business ventures in agriculture and allied sector
- Operating milk collection units in connection with GCMPUL as many of the members are engaged in diary sector
- Streamlining marketing of produce by the members
- Helping the members in getting assistance under various schemes
- Working with Panchayats in selection of beneficiaries under various schemes without prejudice or political interference
- Facilitate increased interaction with KVK scientists and NABARD officials through direct contact and ICTs (SMS, social media platforms like WhatsApp)
- Organization of Krishi Mela
- Consultancy to members on basic human rights, social development, and awareness building activities
- Production and export of certified paddy seeds in collaboration with ICAR
- Organizing training for member and non-member farmers in collaboration with KVK, Birchandranamu and NABARD.

The FPO is working solely on own capital generated by its various activities and have not applied for loans yet. It is also working on building a training hall for better arrangement of meetings and carrying out regular activities of the Trust. Construction of an air-conditioned outlet for sale of various commodities produced by the members of the FPO is also on the offing with financial assistance of NABARD.

Fig.: The FPO has collaborations with GCMPUL and the milk collected at the collection unit (in the picture above) is transported to the processing unit at Agartala. Milk is collected twice a day from both member and non-member farmers. An educated youth from the village is appointed by the FPO for the collection activities. In collaboration with GCMPUL, subsidised inputs and feed are distributed to the farmers through the milk collection unit as well.

Fig.: Mr. Priyabandhu Pal (L), a member of BAPDT, has won multiple awards for his indigenous invention (R) for separating honey from the comb without harming the comb or honey bee larva present in the comb.

Fig.: Kamal Ghosh, a Diary farmer and member of the FPO, owns 15 cattle and also has a milk processing unit (pictured above). Milk is condensed to produce 'kheer' (thickened milk) used in peda, a sweet that has very high demand throughout the state. Around 5 lts of milk (Rs. 35/lt) is used to produce 1 kg kheer which he sells to sweet shops for Rs. 260, giving him a profit of Rs. 85 per kilo. In a day, around 300 lts of milk (owned and procured from other diary farmers) is processed in this unit.

2. Poor infrastructure: Infrastructure is still a major issue in the state. Tripura is connected to the rest of the country through NH-44 and through airways. But because of high cost of transportation through airways, NH-44 is practically the lifeline of the state for both import and export of agricultural produce. During rainy season every year, the highway becomes practically unusable making agricultural trading a nightmare for few months every year. Railways are recently introduced in the state connecting it to Assam, West Bengal, Tamil Nadu and Delhi but it is yet to start serving for agricultural transportation. Within the state, producers prefer selling their produce at farm-gate to avoid transportation cost. Rice is the major crop in the state but there is only one modern rice mill in the state. The infrastructural facility in the rural markets is poor and the private traders are operating in procuring agricultural produce. Of the 555 Primary Rural markets in the state, 84 are Wholesale Assembling Markets and 21 are regulated markets. Though a huge quantity of fish, meat, dry fish, and livestock is traded in these markets, there is no scientific slaughter house, frozen chamber for dressed meat and fish, cool chambers, refrigerated vans,

warehouses, etc. in or near the market yard. There has been no financial support either from the financial institutions or GOI towards development of markets and the marketing development activity is solely financed on the basis of allocations in the State Plan. Of late NABARD is extending financial assistance under Rural Infrastructure Development Fund (RIDF) for development of rural marketing infrastructure like hats, cold storages etc.

3. Subsidy dependent rural population: Initiatives in rural development in the state has been highly focussed on giving subsidies and incentives to the rural families under various schemes and programmes. In farming sector alone, under CSSs as well as State Plan, a major way of attracting farmers towards new technologies, varieties, methods, etc. Is to subsidise it for the adopting farmers. Tripura being dominated by economically poor marginal producers, subsidy definitely works in attracting them towards a technology but unfortunately, the interest comes and goes along with the subsidy. There has also been little to no initiative from the department to understand practical feasibility of the technology in local conditions, as major push comes from Central Sector Schemes.

During discussion with respondents from departments, entrepreneurs, FPO members, etc., a recurring theme was the subsidy and assistance dependency of the rural population. The rural people of the state being mostly Below Poverty Level (BPL) (3,97,798 BPL families in rural areas as opposed to 10,000 BPL families in urban areas), are covered under 23 social security scheme at present (Annexure 1). The beneficiaries are generally from different households under different schemes but sometimes there is overlapping too. While the state has very low employment opportunities and income sources, the schemes are very useful for the rural population for subsistence of livelihood, especially for women, senior citizens, and the disabled. But in last few years, there has also been a downside of this. Because of the easy availability of the pension under one or the other scheme, many of the rural people have become unwilling towards taking up agricultural or other economic activities that require high investment of time and physical efforts. Many of the officials and FPO members have expressed in no uncertain terms that while the subsidies are very important in the current economic environment of the state, there should also be proper monitoring in disbursement of the pensions. Further it needs to be reiterated by the Govt. that the subsidies are only stop gap measures and are to assist the rural populace to find alternative sustainable livelihood. The schemes are being taken for granted by the people and this has made it more difficult for the extension system to motivate the people into entrepreneurial activities.

4. Entrepreneurship development: Entrepreneurship in agricultural sector is almost non-existent in the state and so are efforts to develop entrepreneurship. While a Nodal Training Institute has been established under the Agri-Clinics and Agri-Business Centre Scheme of Ministry of Agriculture and Farmers' Welfare, Government of India at T-SAMETI in 2016, further activities have been nil on training fronts. According to the officials at T-SAMETI, applications have been invited from agricultural graduates but very few applications were received, so training batches could not be started due to lack of minimum number of candidates. It has been opined by many of the officials and agricultural stakeholders in the state that the young generations are more into Government

jobs rather than agripreneurship, and so their lack of interest is a major hurdle. Tripura has an agricultural college from which 50-70 students graduate every year. Moreover, 99 seats are allotted every year through Tripura Joint Entrance Examination for Bachelors in Agriculture, Horticulture, Forestry, Fisheries, and Animal Husbandry (http://tbjee.nic.in/2706201701.pdf) along with many students opting for private colleges. But this potential is mostly untapped as there has been no awareness creation initiatives in the colleges as of now to encourage the students to explore the possibilities in agripreneurship. Many rural youth engaged in agricultural activities, on the other hand, have been interested in the scheme but because of their lack of educational qualification in agriculture and related field, were not eligible to take training under the scheme.

Entrepreneurship in Floriculture: Making a niche

Mr. Pradip Debnath of Laxmibill village under Bishalgarh Horti Subdivision started out as a small flower producer in his ancestral land of 2 kani. During winter season one year he decided to plant marigold and got a very good harvest. This also attracted the attention of the Department of Horticulture who, seeing his interest in flower cultivation, arranged for him to have multiple trainings both within and outside the state in flower cultivation and management practices. From his visits to different states for the trainings, he also used the opportunity to understand about value chain in floriculture. Currently, he has expanded his activities to marigold, tuberose, rose, and orchids. Furthermore, he has started his own flower nursery from where he sells ornamental plants and seasonal flowers to Government offices, and private customers and organizations. He also deals in flower bouquets, loose flowers (marigold), cut flowers (Gerbera, Anthurium, Rose, orchids) and ornamental plants that he collects from the flower growers in and around his village making about 10-25 percent profit per unit of consignment. He also provides consultancy to the flowers growers regarding plant health management for free. According to Mr. Sarkar, selling in the open market is more profitable as the prices are higher compared to the Govt. rates but the supply is constant. In his own words, “Flower production is highly profitable in Tripura as there is a large market for the produce and generally the profits are much higher compared to agricultural crops. But most of the farmers get content very soon and do not want to put up hard work and increase their production. Most of the flowers in the market of Tripura are imported form Delhi, Kolkata, and even Assam.” From a few acres of land that was used to grow rice by his father and hardly make both ends meet, Mr. Debnath has not just turned around his economic condition with flower production, he has done that with minimum financial assistance from the Government. He has bought new lands, increased his yearly profit close to Rs. 50 lakhs, is planning to expand his nursery, is providing employment and livelihood to three families, and most importantly, has proved himself as an example for many on his own terms.

5. Agricultural marketing management: State Agricultural Marketing Boards have become defunct after the expiry of five year terms of the nominated members since 1993. The Board could not be elected as the elections of the marketing committees of the regulated market could not be held subsequently. All the 12 regulated markets are being managed through the nominated Committees under the supervision of Superintendent of agriculture. There are no sections/ departments looking after marketing in the line departments except in Department of Agriculture (DoA). But the Marketing Board of the DoA is also functioning with a single staff who is slated to retire soon. It is just a rudimentary cell that exists only in name. Because of lack of manpower, market extension related activities, research studies, monitoring of APMC Act, etc., are impossible to take up. As a result, marketing policies are also totally ignored in Annual Plans or any other policy document or activities of the state government. For other departments, marketing cells are totally non-existent and as a result there exists almost no official information or data on market information in Horticulture, Fisheries, or Animal Resource sectors.

6. Research and development: State Agricultural Research Station (SARS) and State Horticultural Research Station (SHRS) under Department of Agriculture and Department of Horticulture respectively are the major R&D units in the state. Major activities of these units are technology refinement, demonstration, and training activities. In terms of infrastructure, the research stations are not well equipped enough to take up novel research on technology innovations. The KVKs also engage on similar activities, mostly focusing on technology demonstration and training activities. There has been no new technology developed in the state. Research and refinement of existing indigenous technical knowledge is also almost non-existent. This lack of technological advancement has limited the agricultural production and productivity as well, engaging the sole focus of the public extension machinery on production increase and totally ignoring the marketing structure in the state. There has been no research on market structure or value chain potential in the state as well. For Department of Fisheries, research and development wing is altogether non-existent and as a result, major research and development initiatives in the state are taken up by the College of Fisheries, Central Agricultural University, Lembucherra. Major activities of the College include identification of fermentation process of Hilsa and shidal, recipe standardization of packaged fish curry; canning and storage study for Fish-Veg Mixed Curry (FVMC); processed

fish based snacks; development of products like fish pickle, prawn pickle, fish cutlet, fish ball, fish finger, fish sausage, kamaboko products, dried fish products, and smoked fish products. Regular training programs are also organized by the CoF in collaboration with DoF for rural women on fish product development and packaging (CoF, 2018). Research and development infrastructure of Animal Resources Development Department is yet to have a proper structure in the state.

Recommendations for value chain development in selected agricultural produce in Tripura

1. Planned production: Restructuring of production focus is required in the state with special attention to major economically remunerative agricultural produce already identified by the Departments in each sector. Market led production will help the farmers avoid distress sale that is predominant now and will also help in streamlining agricultural as well as market related activities.
2. Entrepreneurship development: Intensive awareness creation by T-SAMETI for agripreneurship development in the state being the nodal agency under the AC&ABC Scheme implemented by National Institution of Agricultural Extension Management (MANAGE). Given the current constraints in terms of infrastructure development, there is a higher scope in agro-based development in the state compared to industrial development. And this opens up a lot of avenues for innovative marketing opportunities ushered in by agripreneurs.
3. Market focus with policy support: The first step in development of market infrastructure in the state will be through policy support and planned focus. And for that, a dedicated marketing cell needs to be the first priority of the state Govt. to properly understand the production and marketing status and plan interventions based on the needs of the sector. Establishment and strengthening of marketing boards in each sector with sole focus on research and policy advocacy of market development needs immediate focus.
4. Collaboration and partnership: Pineapple from the state is being exported to Dubai by APEDA but without collaboration with the Department of Horticulture. Registering with APEDA as well as other agencies for export of fruits like pineapple, orange, and jackfruit will immensely profit the farmers and help in market led production focus as well.
5. Infrastructure development: Increasing production without market or processing facilities will just add to distress sale of high value produce. Proper market and post-harvest infrastructure development along with focus on roads, warehouse, cold storage facilities are also required based on the need of the state, especially for fruits, diary, and dressed meat. In collaboration with Indian Railways, facilities to import and export agricultural produce through railways needs to be put in place at the earliest. Being India's third largest internet gateway with high speed internet access through Bangladesh, ICT infrastructures can highly influence the communication pattern increasing visibility of the agriculture sector nationally and globally.

Conclusion

Tripura is an agrarian economy and with large majority of its population dependent on agriculture, economic development of the state largely depends on the economic condition of the sector and the farmers. This makes agricultural market and value chain an indispensable part in any strategy to develop the sector. Tripura is bestowed with favourable growing condition for many high value agricultural produce, so exploring the best possible avenues to provide them accessible market, value addition to the products of the state and beyond is of immediate necessity. Reforming agricultural marketing will require policy and financial support from the public sector and innovations of the private sector. Exploring possibilities of public private partnership, entrepreneurship development, integrating ICTs for better communication, and a consumer focused production needs the attention at the moment for establishing a strong value chain system in Tripura and making a positive impact on the economic condition of the state.

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Annexure 1

Beneficiaries sanctioned under various Social Security Schemes

Sl. No.	Social Security Schemes	No. of beneficiaries
1	Indira Gandhi National Old Age Pension	1,61,959
2	Indira Gandhi National Disable Pension	3,209
3	Indira Gandhi National Widow Pension	19,879
4	Pension to 60% disability of BPL families	4,763
5	Pension to Rickshaw pullers of BPL families	457
6	Pension to Cobblers of BPL families	60
7	Tripura Incentive to Girl Childs of BPL families	34,855
8	Pension to Widow & Deserted of BPL families	56,182
9	Pension to Bidi Sramik of BPL families	155
10	Pension to Blind & Handicapped Pension of BPL families	4,531
11	Un-employment allowance for 100% Blind of BPL families	35
12	Widow State Pension Scheme	1,952
13	Allowance for 100% Blind of BPL families	747
14	Pension to 80% & above disabled person of APL families	1,829
15	Pension to Persons who lost 100% eye sight of APL families	490
16	Pension to Un-married women of the age 45 years and above of BPL families	1,463
17	Pension to Motor Shramik of BPL families	391
18	Pension to Laundry Workers of BPL families	289
19	Pension to Barber Workers of BPL families	409
20	Pension to Handloom Workers of BPL families	726
21	Pension to Fishermen of BPL families	1,151
22	Pension to senior citizens of BPL families	8,828
23	Pension to Deserted Women of APL families	2,034

(Source: http://ecostat.tripura.gov.in/At-A-Glance-2015-16.pdf)

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