Sector wise analysis

Live stock, Meat Processing and Abattoir

Introduction

Livestock rearing is an integral part of the people of India and is widely practiced in almost all parts of rural India. These livestock are then used for meat and their by-products, milk, egg etc and act as the source of income support for a majority of population of West Bengal. Amongst the above meat is the major form of consumption of livestock here. Although rearing of animals in a disease free environment is also an issue, delivery of "safe, food grade meat" is more dependent on hygienic slaughtering, especially for serving the domestic market. Therefore this is an important issue in the meat industry in India today because of the emerging health threats due to various diseases which affect the quality of meat. However, in India, majority of slaughtering continue to happen today in extremely unhygienic conditions.

Indian Scenario

According to latest estimated meat production in a year is 2.3 million tones and contribution of different categories is as follows:

Category	% contribution
Bovine	33%
Goat/ Sheep	33%
Poultry	23%
Others incl. pig	11%

India Buffalo and goat meat export witness strong demand due to its lean character and near organic nature. India is the 5th largest exporter of bovine meat in the world. Besides the export, there is huge demand in the domestic market to which the industry has to cater to. In context of this the recent trend in India is to establish large abattoirs-cum-meat processing plants with the latest technology. India has already established ten state-of-art mechanized abattoirs-cum-meat processing plants under private initiatives, PPP mode in various states based on slaughtering buffaloes, goat/sheep and pigs.

The country has exported 1,366.17 MT of processed meat to the world for the worth of Rs. 2,104.86 Crore during the year 2010-11.

However there is scope for increasing exports many times. This will be possible only when the animals are reared in disease free environments, traceability of origin in the cattle and hygienic and scientific environment and the animal stock can be increased rapidly. Present exports are largely to Middle East, South Asia and China (mainly ovine meat through Vietnam). The exports to countries with strict hygienic safely standards are few.

Modern Abattoirs

In order to promote hygienic and scientific slaughtering and in order to ensure that the end users get "safe to eat" meat from the end delivery point, Ministry of Food Processing Industries, Govt. of India, embarked on a major scheme to provide significant fiscal incentives to modernize all existing abattoirs and set up large new modern abattoirs all across the country. They have been providing funds to both public and private sectors. But the schemes till date have limited success. The few notable successes have been mostly in projects where private sector who have set-up large, highly modern units and in the few "progressive" Municipalities.

The failures have been many, especially in most Municipal areas and even in Municipal Abattoirs. The reasons are many. While there is a sizeable "meat consuming" population in India, superstition and experience from the past, has lead to popular opposition to the citing any Abattoir, however clean and moderised, any where in close vicinity of population centre, even in areas where the large majority of the population are meat consuming. Also, faced with severe public opposition, municipalities have not taken too much initiative to push the projects forward. This public opposition extends among the investing communities also and normally it is difficult to find proper private sector promoters.

Projects under Municipalities are usually small in nature with small investments. Even then they are unable to finance the gap between total cost and Govt. of India grant. In some cases, they can not even pay for the low DPR preparation cost.

Modern Abattoirs can be of two types, first category abattoirs are those where hygiene is ensured at the slaughter space and environment, operators (butchers) are clean, incoming animals are inspected before slaughtering and the slaughtered animals are stored before dispatch in clean, cool spaces. Transportation to end use point should also be clean and all effluents should be suitably treated before any discharge into public systems or spaces. The Second category is those where large modern Slaughter Houses are set-up with mechanized environments and sophisticated environment management systems.

Ministry of Food Processing Industries normally prefers the Second Category when they are considering projects for giving grants.

Looking at the Slaughter house scenario In India, most slaughter houses are not financially viable. International experience however presents a very different picture. Most abattoirs depend on revenue from the meat sold. Some even consider sale price of skin (especially for goat/ sheep and bovine) which are used by the leather industry. European slaughter houses however have equal earning from by-products including skin) as they do from meat (especially true in the case of pigs). Realisation from skin also increases dramatically when using aided de-skinning techniques. The by-products are mostly disposed off through the grey market for a variety of reasons.

Status of Modernization of Abattoir/ Setting up of new modern abattoir under MoFPI

Approval Committee approved the setting up of 9 new abattoirs during the year 2008-09 and one more was approved during 2010-11. The Ministry has so far released funds for setting up of 10 modern Abattoir Projects. Till now two of the abattoirs have been completed which are located at Ahmednagar (Maharashtra) and Dimapur (Nagaland).

Ahmednagar Abattoir Project: Ministry of Food Processing Industries approved the establishment of a modern abattoir at Vadgaon Tandli, Ahmednagar, Maharashtra by the District Goat Rearing & Processing Co-operative Federation Limited, and Ahmednagar with a capacity for slaughter of 1600 small animals per day. The total project cost of the Abattoir is Rs 23.52 crores; out of this financial assistance (i.e grant in aid) of Rs 8.51 crores has been released. The abattoir was commissioned on 23rd June 2011.

Dimapur Abattoir Project: Establishment of a modern abattoir with slaughter capacity of 250 large animal, 250 pigs and 150 small animals per day at Khat Khati (Burma Camp), Dimapur, Nagaland by Dimapur Municipal Council was sanctioned by the Ministry of Food Processing Industries with a total project cost of Rs 22.88 crores. Of this, financial assistance (i.e grant in aid) of Rs 14.02 crore has been released. The project has been completed and inaugurated on 26th May 2012.

The rest are under implementation. The List of these approved Abattoirs is as follows:

Status of Abattoir Projects sanctioned by MOFPI (as on 30.06.2012)

Sl.no	Name of Executor	State	Amount sanctioned for grant (Rs. Lakh)	Amount disbursed (Rs. Lakh)	Remarks
1	Kolkata Municipal Corporation	W.B	1287.34	128.73	1st Installment released
2	Greater Hyderabad Municipal Corporation	A.P	1478.98	591.59	2nd Installment released
3	Municipal Corporation Shimla	H.P	1142.00	114.2	1st Installment released
4	Jammu Municipal Corporation	J&K	1500.00	150	1st Installment released
5	J & K Sheep and Sheep Products Development Board, Srinagar	J&K	1410.00	141	1st Installment released
6	Municipal Corporation, Patna	Bihar	1097.21	109.72	1st Installment

Status of Abattoir Projects sanctioned by MOFPI (as on 30.06.2012)					
Sl.no	**Name of Executor**	**State**	**Amount sanctioned for grant (Rs. Lakh)**	**Amount disbursed (Rs. Lakh)**	**Remarks**
					released
7	Municipal Corporation, Ranchi	Jharkhand	864.60	86.46	1st Installment released
8	Modern Abattoir at Majhitar, East Sikkim	Sikkim	616.72	61.67	1st Installment released
	Total		**11685.37**	**3636.56**	

Source: Annual report MOFPI, 2012

West Bengal Scenario

West Bengal is the highest producer of meat in India followed by Andhra Pradesh, Maharashtra, Uttar Pradesh and Bihar. It is also the largest consumer of meat products including "fresh" meat.

Bengal black goat has high demand in the export market due to its low fat and low cholesterol character. It is abundantly available in Murshidabad, Malda and Birbhum districts.

Around 20.5 million goats are slaughtered in Bengal every year. Bengal produces over 31 percent of the total goat meat production in India annually. Besides meat from goat, other forms of meat from bovines and birds also have huge demand and market here. There are hardly any exports out of the state, although it is understood from market sources that bovine meat, slaughtered in the state are routinely exported through other states as there are no Export Certified Slaughter Houses.

Un-organized market dominates over the organized market in Bengal meat industry. This is true even for poultry. There are a few organized slaughter houses namely:

List of Abattoirs in West Bengal

Operational Abattoirs

Bovine:

A. **Tangra slaughter house under KMC :** These fall into three categories:

   Abattoirs for Bovine: On an average 450 bovine/ day is slaughtered by "Halaal" method in batch slaughtering process

B. **Slaughter house at Garden Reach Place:** This slaughter house is owned and operated by a private party. This slaughter house deals with Bovines where around 150-200 bovines are slaughtered per day and the meat is supplied to the market.

C. **Slaughter house at Durgapur:** This slaughter house is owned by Govt. of West Bengal.

Goat:

D. **Tangra slaughter house under KMC :** These fall into three categories:

Abattoirs for Goats: Presently 100 goat per day is slaughtered in Jhatka method

Goat is slaughtered within the shop

Pig:

E. **Tangra slaughter house under KMC :** These fall into three categories:

50 pigs per day is slaughtered.

F. **Slaughter house at Haringhata, Nadia:** Here Pigs are slaughtered and the meat is then supplied to the Kolkata and nearby markets.

Poultry:

Amrit Hatchery: This is a mechanized plant where around 2000 birds are slaughtered per day and meat is supplied to the market. This hatchery supplies meat to Haringhata.

Others: Besides the above Abattoirs and Slaughter Houses there are few entrepreneurs who deal in this meat business. They source the meat from the KMC Abattoirs and Slaughter houses, store it, convert the same into boneless forms and then supply it to Mumbai for export to other countries.

Most municipalities have Slaughter Houses or at least designated Municipal Slaughter areas. But slaughtering outside the designated areas is common and rampant.

Initiatives towards new modern Abattoirs

Modern Abattoir at Dhaniakhali, Hooghly: This project had been initiated by the Pailan group, the Detailed Project Report was also prepared. This was primarily for goats but the developer then has dropped the project and this was not executed.

Modern Abattoir at Murshidabad: This project was initiated but got stuck due to local clearances and permissions.

Alana Abattoir: This was an abattoir by the private group which was established in Howrah. However this did not have the concept of Effluent Treatment Plant as a result of which it was ultimately non-functional.

Sourcing of Animals

Given below is the data as per the 18th Livestock Census in West Bengal. The following are the quantum of Livestock in West Bengal:

Livestock base of West Bengal									
									Figure in lakhs
Census	Year	Cattle	Buffalo	Sheep	Goat	Pig	Total Fowl	Total Duck	Total Poultry

18th Livestock Census	2007	192	8	16	151	8	519	120	642

Source: Animal Resource Development Dept. govt. of West Bengal, 2010-11

Other than livestock base of West Bengal, live bovine and goat are brought from Bihar, Uttar Pradesh, live pigs are brought from Orissa, Uttar Pradesh and Andhra Pradesh for slaughter purpose.

Sourcing of animals within the state:

Bovine:

- Pandua market, around 4000 bovine arrive on every Sunday
- Murshidad (specially in the boarder area)
- Top five districts in terms of total number of bovine are namely:

Sl.no	District	Bovine Population (Fig. in Lakhs)
1	Purba Medinipur	14.06
2	Murshidabad	14.05
3	South 24 Parganas	11.13
4	Cooch behar	10.93
5	Jalpaiguri	10.26

Source: Animal resource development Dept, west Bengal, 2010-11

Goat:

- Kaliachak, Malda
- Murshidabad
- Garden reach
- Top five districts in terms of total number of goat are namely:

Sl.no	District	Goat Population (Fig in Lakhs)
1	Murshidabad	19.97
2	Bardhaman	14.08
3	Paschim Medinipur	13.92
4	Malda	9.75
5	Nadia	9.68

Source: Animal resource development Dept, west Bengal, 2010-11

Pig:

Pigs are sourced from numbers of village markets (haats).

Top five districts in terms of total number of pigs are namely:

Sl.no	District	Pig Population (Fig in Lakh)
1	Jalpaiguri	1.23

2	Bardhaman	0.99
3	Darjeeling	0.75
4	Paschim Medinipur	0.72
5	Malda	0.60

Source: Animal resource development Dept, west Bengal, 2010-11

Birds

Around 9 Lakh birds are slaughtered per day in the Kolkata, 24 Parganas (N), 24 Parganas (S), Siliguri, Durgapur and Asansol region itself.

The District wise availability in West Bengal is as shown below: **(Fig in Lakh)**

Sl. no	District	Fowl Population	Duck Population	Poultry Population	Total Population
1	North 24 Parganas	70.47	8.82	79.37	158.66
2	Paschim Medinipur	60.38	7.63	68.09	136.10
3	Bardhaman	46.24	17.78	64.29	128.31
4	Murshidabad	39.54	12.05	51.68	103.27
5	South 24 Parganas	38.55	11.04	50.25	99.84

Source: Animal resource development Dept, west Bengal, 2010-11

Marketing

The entire market in West Bengal comprises of two types of buyers

1. The Institutional Buyers &
2. Retail consumers.

The institutional buyers have a preference for fresh chilled meat which constitutes only 10% of total production.

The retail consumers have a preference for fresh hot meat over frozen/ chilled met.

- Bovine:

- The bovine meat market is mainly concentrated in Kolkata specially in Tangra, Garden reach area.
- The institutional buyers also collect bovine meat through licensing agencies of Tangra slaughter house.

- Goat:

Goat meat shops are seen in all the major vegetable markets of West Bengal, however significant number of shops is seen within the Municipal markets.

- Pig:

Pig meat is sold to institutional buyers through agents. Retail markets are seen in Tangra area. West Bengal Livestock Development Corporation Ltd also produces limited Pig meat which is marked through its own counters in Kolkata.

- Poultry:

Some of the big players among institutional suppliers are: Venkys, Suguna, Amrit, Farm Fresh

There are around 9000 chicken shops in the state out of which 50% is concentrated in Greater Kolkata area.

Problems Faced By Abattoirs

1. There is no APADA approved slaughter house in the state as a result meat from the state is exported through Mumbai where significant number of APADA approved slaughter house is observed. There are around 12 merchant exporter of process meat from West Bengal.

2. As 90% of the consumer have preference for wet meat, a central modern slaughter house will not be able to cater the market as per the requirement of the market.

3. Modernized abattoirs require better technology and in turn a high capital infusion. However without a major focus on export these abattoirs are not financially viable because of the comparative low pricing in the domestic markets.

4. Meat produces in West Bengal do not meet the export standard requirements due to the methods and techniques adopted during slaughtering.

Up-coming project:

A modern semi automated slaughter house for Bovine is coming up under Kolkata Municipal Corporation in Tangra. Proposed capacity for the modern abattoir is 1200 bovine per day in two batches.

Suggestions

1. There is huge scope for increasing the total production of meat and by-products in the sate. And this means scope for major investments in this sector.
2. Three more modern slaughter houses for bovine can be proposed in the district of Howrah, Murshidabad and Jalpaiguri (Siliguri). At least two slaughter house need to be approved by APEDA, preferable Howrah and Murshidabad.
3. Frozen cold storage can be set up in and around Kolkata dock complex with a capacity of 1000 MT for export purposes.

4. Modern meat outlets for all types of meat need to be promoted.
5. Promotion of rearing of Bengal Black Goat.
6. Municipalities have to modernize their Slaughter Houses. For this, they need financial support for preparation of a Report for making application and grant should be 75% of the project cost. Alternately, cost of preparation of 2/3 model cases (with varying number capacities) can be funded and after acceptance, could be circulated to all. Then the municipal bodies can just modify the same to suit their specific sites and local civil market rates. The advantages of a modern facility should be clearly explained to all municipalities, both at administrative and political levels..

Export Import Scenario

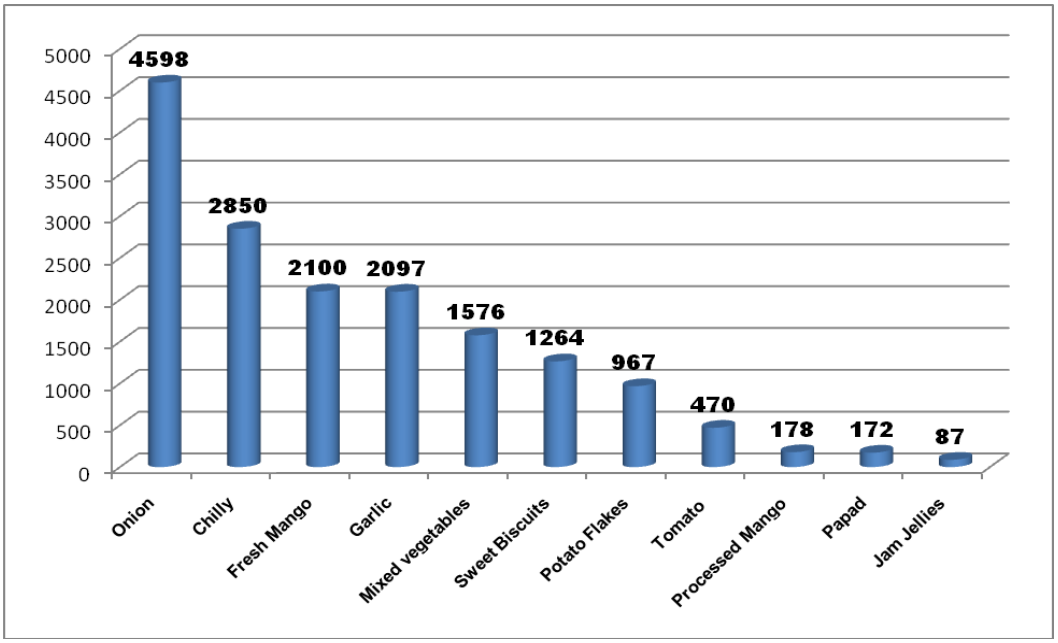
West Bengal has 11 custom points for trade with other countries. These custom points are:

- Kolkata and Haldia Sea
- Kolkata Airport
- Petrapole
- Hilli
- Ghagadanga
- Kolwalghat
- T.T. Shed (Khidirpur)
- Changrabandha Railway. Station.
- Ranaghat
- Falta SEZ
- Manikanchan SEZ

Out of the above custom points, first three are very important in terms of export and import of processed food items.

Export (Other than Fish)

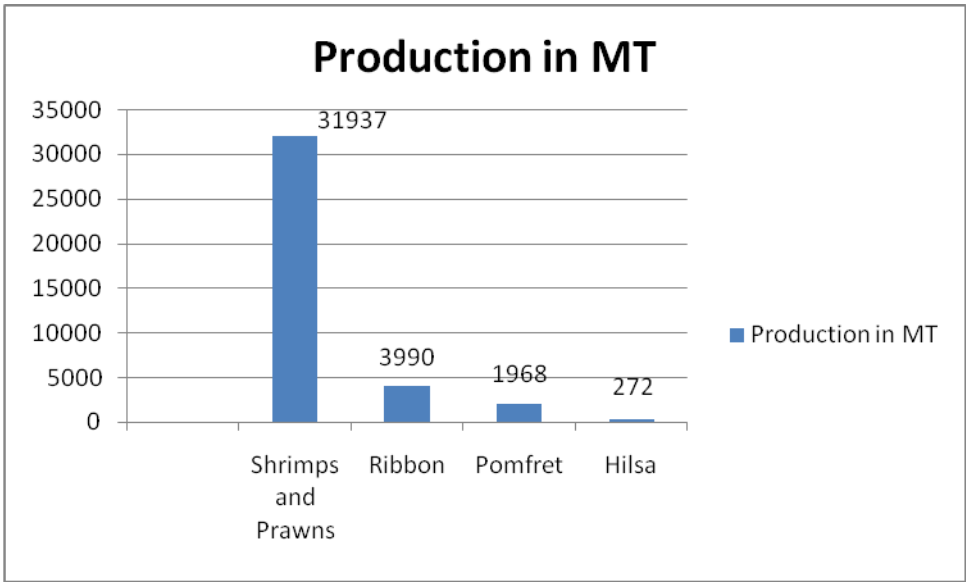
Significant exportable items constitutes onion, chilly, fresh mango, garlic, mixed vegetables, sweet biscuits, potato flakes, tomato, processed mango, papad, jam, jellies and fish. During 2010-11, export through Kolkata & Haldia Sea, Kolkata Airport and Petrapole was as follows:



Source: Commercial Intelligence and Statistics (DGCI&S), *Kolkata, 2010-11* **All figures are in MT**

Importing ports: Pakistan, Sri Lanka, Jordan, Thailand, United Arab Emirates, Yemen Republic Kuwait, Singapore, Hongkong, Malaysia, Bangladesh, USA, China, Vietnam, Qatar, Italy, Netherland, Sweden, Switzerland, Kazakhstan

Fish Export



Source: Source: Commercial Intelligence and Statistics (DGCI&S), *Kolkata, 2010-11* **All figures are in MT**

Importing ports: Kuwait, Singapore, Hongkong, Malaysia, Bangladesh, USA, China, Vietnam, Qatar, Belgium, Taiwan

Import

Major imported items during 2010-11 constitute:

- Fish (Hilsa) from Bangladesh
- Milk & Milk Products from Denmark,
- Dried Peas from Canada, USA, Australia, France, Russia, Ukraine,
- Cashewnut fresh / dried from Myanma, Cote D' Ivoire, Gambia, Ghana, Guinea

Sector wise analysis

Food Parks in West Bengal

Food Parks are comprehensive industrial estates for food processing units where the industries would have provision of common facilities like cold storage, cold chain, effluent treatment plant, warehousing, power connection, water facilities, sewerage etc. The creation of these common infrastructures would benefit individual units particularly the small and medium scale units, because these are expensive to be set up by any single individual unit. Therefore a common park with all the infrastructures would help in the growth of the food processing industry.
However, most of the projects on food processing could meet the expected level of success if the following factors are considered:

- A comprehensive project report from the raw material supply chain to the market, assessing infrastructure needs at every stage
- Adequate funding for components such as internal roads, drainage, environmental control facilities and solid waste management facilities
- A competent proposal appraisal
- Identification of the various components of the supply chain.

The studies further suggested that the park will be successful only if infrastructure for on-Farm Storage, Primary Processing, retail Outlet, Pre-cooling unit, Packaging center etc. is provided on a cluster basis, without just insisting on all common facilities to be provided within the acquired area of the Park. Hence, the concept and the need of Mega Food Park came into being.

Government of India in order to harness the vast agri-potential of the state has been promoting the development of Food Parks for quite some time now. As stated earlier in this report, Food Parks promulgated by Government covers a very wide spectrum of produces and products from sub-sectors comprising agro-produces, horticulture produces, plantation outputs, fisheries outputs and animal husbandry products.

West Bengal, in its efforts to take advent of the vast agri resources available has taken initiative in setting up a quite a few Food Parks. And they cater to various dimensions of Food Processing including Fisheries. Though most of them have been established by Government initiative, a few have been established by Private agencies also. The Food Parks established are in various stages of implementation.

In West Bengal the Food Parks in South Bengal and North Bengal are separately detailed below:

South Bengal

There are about 9 Food Parks in South Bengal. These are located at the following regions:

1. Sankrail
2. Howrah
3. Chakgaria
4. Dankuni
5. Haldia
6. Murshidabad
7. Shankarpur
8. Sultanpur
9. Kakdwip

The Food Park at Sankrail

Location : Sankrail, District: Howrah, West Bengal. The Park is situated at a distance of about 28 Km from Kolkata (by road).

Developer : West Bengal Industrial Development Corporation Ltd.

The Food Park at Sankrail, Howrah is a composite facility for manufacturers, exporters and entrepreneurs dealing in the Agro/Food and related industries. It is an integrated Industrial Park, built on the industry cluster concept is meant for both domestic and foreign firms, who wish to avail of the opportunities being offered by this fast growing segment of industry both at the national and international levels.

The food park at Sankrail has been developed in two phases, Phase I and Phase II. The Phase I is known as the Sudha Ras Food Park and Phase II is known as Kandua Food Park.

Sankrail Food Park (Phase I): Sudha Ras Food Park

Area : 49.98 Acres

Project Brief: Sudha Ras food park is an integrated Industrial park comprises of 35.5 acres of marketable plots (Phase I). The facility has been developed under the Food Park Scheme of MoFPI and was inaugurated in February 2006. Grant of Rs.40 mn was received & utilized for this project. In order to cater to the massive agro resource base of Howrah, Hooghly, Burdwan & Medinipur districts, the Sankrail Food Park was conceptualized in 2004. A piece of land measuring around 49.98 acres belonging earlier to Airport Authority of India was purchased by WBIDC to develop the said Park. Work began in October 2004 and was completed in December 2005 in all respects. The plots in the Park are having widespread, well-connected roads cater to various Food Processing units. On account of its location wise advantage, well marketing as well as better infrastructure proposed, all the 22 (Twenty Two) plots were sold out before construction activity began. Common facilities include stabilized power, treated water, Drainage, rainwater harvesting, bank, R& D Lab, Meeting cum convention hall etc. A few plots are specifically earmarked for facilities viz. cold storage, grain storage, warehousing etc.

WBIDC, a corporation under the Ministry of Commerce & Industries, GoWB is the implementing agency. The Park has received an approval of grant Rs. 400 Lakhs from MoFPI, Govt. of India and amount has been disbursed. The Park is complete in all respects today.

Hon'ble Chief Minister of West Bengal has inaugurated the Food Park on 15th February 2006. Frito Lay India, a PEPSICO group co. is the anchor unit in the Park and is already in production. A few more units are in various stages of production viz. Favorich Mark Pvt. Ltd., Prestige Ice Creams, National Moulding etc. The plot holders include one/ two cold storage units, a warehouse, a flourmill, a biscuit and a bakery unit, a baking product company, a food grade packing material manufacturer for the metro Kolkata system etc. All the units together contribute significantly to the growth of the Food Processing Industry in the state.

- **Facilities:**
  1. A separate 3 storied Common Facilities Building, where the CFB comprises of administrative wing, Conference cum exhibition room, business center, transporters office, testing and quality laboratory, rest rooms, restaurant, workers canteen etc
  2. Two storied SDF buildings are provided. SDF building has around 16 modules.
  3. Comprises of about 22 fully serviced plots.

- **Infrastructural Facilities**

1. 15 m - 18 m wide low maintenance concrete internal roads.
2. Power supply and distribution system from dedicated sub station of WBSEDCL
3. Potable water supply system has been provided with its water treatment plant.
4. Drainage and sewerage system and a comprehensive rain water harvesting system to recharge the ground water table.
5. Street Lights

- **Employment Generation**

The Park has provided employment opportunities to around 1200-1300 people which includes skilled, semi-skilled and unskilled workforce.

LIST OF OCCUPANTS

Name of Company	Area of operation
M/s. Pepsico India Holdings Pvt. Ltd.	**Potato Chips & Snacks**
M/s. Favorich Ltd.	**Rice & Maize Miller**
M/s. National Moulding Company Ltd.	**Food Grade Packaging Material**
M/s. SS Agarwal (Rollick)	**Ice cream**
M/s. Connect Finance Pvt. Ltd	**Cold Storage**
M/s. SAJ Food Products Pvt. Ltd	**Bakery**
M/s. RCI	**Cold Storage**
M/s. Teage Ltd.	**Baking ingredients**
M/s. R.S. Plasfab Private Limited.	**Packaging unit for potato**
M/s. Gee Pee Foods Pvt. Ltd.	**Potato chips, Biscuits**
M/s Jamuna Vincom Pvt. Ltd	**Ice Manufacturer**
M/s Kathleen Confectioners.	**Bakery**
M/s Rose Valley Industries Ltd	**Spice Powder**
M/s Soumya Engineering Works	**Cold Storage**
M/s Surajmal Mohanlal Pvt. Ltd.	**Vegetable & Fruits Processing**
M/s Agarwal & Sureka	**Chanachur, Bhujia etc**
M/s Ramuk Scan Investment Pvt. Ltd.	**Mango, Pineapple Processing**
M/s. LMJ International Ltd	**Agro warehouse, cold storage**

Source: I-WIN data

Kandua Food Park (Howrah)

- Area : 54 Acres
- Project Brief : Kandua Food Park is an integrated industrial park developed under principle of industrial cluster concept. It is developed under the Food Park Scheme of MoFPI and was the 3rd Food Park set up in West Bengal successfully, substantiating the fact of enormous Food & Vegetable availability in West Bengal.
- **Infrastructural Facilities**
  1. 15 m – 18m wide low maintenance concrete internal roads
  2. Power supply and distribution system from dedicated sub station of WBSEDCL
  3. One 250 lakh litre capacity overhead water tank has been provided for the water supply facility to the park.
  4. Diesel Generator with 200 KVA capacity
  5. Street Lights
  6. Drainage and sewerage system and a comprehensive rain water harvesting system.

LIST OF OCCUPANTS

Name of Company	Area of operation
M/S Dream Bake (P) Ltd	**Cakes & Confectionary**
M/S Snow Lion Food (P) Ltd	**Bread/ Loaf**
M/S Nezone Herbals Pvt Ltd	**Bhujia, Papad etc**
M/S Kantian Food & Hospitality (P) Ltd	**Base kitchen**
M/S Triangle Marketing (P) Ltd	**C&F Agent/ Storage**
M/S Jagmohan S. Chandrani	**Juices, Sauces, Squash**
M/S True Tone Distributors (P) Ltd	**Cold Storage**
M/S Kejriwal Enterprises	**Honey processing**

M/S M Agarwal	Packaging unit for Food products
M/S Pampar Oven fresh Foods (P) Ltd	Snack food products
M/S Ever Bright Plastic (P) Ltd	Packaging Unit
M/S Universal Corporation Ltd	Cold storage, warehouse
M/S Excel Imports (P) Ltd Agro	Warehouse
M/S Induss Food Products & Equipments Ltd	Rice Processing equipments
M/S Rainbow Commodities & Derivatives (P) Ltd	Agro Warehouse
M/S Vadilal Industries Ltd	Ice cream
M/S Sunrise Spices Ltd	Spices
M/S Vikash Kumar Jain	Cold storage
M/S Crystal Roadways (P) Ltd	Cold storage
M/S Sumash Developers (P) Ltd	Agro warehouse

Source: I-WIN data

Food Park (Fish Park) - Chakgaria, 24 Parganas (S)

- Area: 14 acres
- Developer: BENFISH
- Location: Chakgaria, South 24 Parganas, West Bengal. It is near Faculty of Fishery Sc.
- Project Cost: Rs 8.01 Crores
- Project Brief:

Chakgaria Fish Food Park is Fish processing centre. It comprises of common cold store, flake ice packaging facility, Office spaces, Administrative spaces etc. Has its own ETP and water treatment plant. It has facilities for 10 units. The main focus is on the processing and export of prawn.

The park located at Chakgaria has been implemented by BENFISH, a Corpn. under Dept. of Fishery, Govt. of West Bengal. The Food Park infrastructure has been built to cater to Fish Processing units in the form of developed plots. Common facilities Centre provides for cold storage for storing, ice flake unit for providing ice to fresh catch, processing etc. and such related activities. Benfish spread over an area of 14 acres now renamed as International Sea-food Processing Centre, of internationally accepted standard with the assistance from the Fisheries Department, the Ministry of Food Processing Industries, Govt. of India and NCDC (National Cooperative Development Corporation). The project has got approval as well as disbursement of Rs. 4 crores grant from the Ministry of Food Processing Industries (MoFPI), Govt. of India. NCDC provided funds for establishment of 10 Processing Units for

processing prawn along with modern facilities of international standard thereby earning huge foreign exchange. During 2009-10, 863 M.T. processed prawn had been exported with its value for 288.25 crores. The project now has been functioning in full swing with 10 processing units with a central administrative building, quality control, laboratory, cold-storage, ice-plant, drainage etc.

- The 10 operational units are listed below
  1. Z A Sea Food Pvt Ltd.
  2. Nizamirekha Sea Food
  3. Sahada Export
  4. Milsa Agro Export Pvt Ltd
  5. Milsa Sea Products
  6. Simpo Exports
  7. Caroline Exports
  8. Sadab Sea Food
  9. S. D Heavy Sea Food
  10. Digha Sea Food

The total production of each units varies from 12 tons to 25 tons per day. The cost of the machinery involved in the plant is Rs 75 lacs to 2.5 crores. The machinery used is both Indian made & imported. The total production is exported to countries like Japan, China & Vietnam. Total manpower in each unit varies from 120 to 200 workers inclusive of both skilled and unskilled. Water, Electricity & labour are the major requirement of these units. Raw materials are obtained from North & South 24 Parganas & East Medinipur. Large quantities of shrimps, prawn, etc are obtained and processed. The finished products are stored in the cold storages and then exported. The capacity of Cold storage is 35 MT.

Modular Food Park, Dankuni, Hooghly

- Area: 530 acres
- Developer: M/s Keventer Agro (P) Ltd
- Location: Dankuni in District Hooghly, West Bengal, India
- Project Cost: Rs 170 Crore
- Project Brief:

Modular Consultants Pvt. Ltd., a private entity had conceptualized the state's first Food Park to be located at Dankuni in Dist: Hooghly in 1996. The company has conceived, designed and planned the first integrated Food Park in the country with three industrial clusters in Food Sectors Post Harvest Management system like –

- Food Processing Park
- Food grain Park

• Technology Park

This integrated Food Park is being developed as the nucleus facility towards integration of food sector supply chain and value chain in the 3-tier infrastructure for procurement, storage, processing, packaging and distribution of food commodities by providing latest technology and quality management systems.

MFP, Dankuni has been planned on 530 acres of land and is located in one of the most suitable locations with access infrastructure like Eastern Railways network, NH 2 Bypass, Durgapur – Haldia Expressway / NH 6 linkage river Hooghly and Bally canal.

Due to various problems, the promoters could not go ahead with the Project. The park had also got approval of MoFPI, Govt. of India. A grant of Rs. 75 lakhs had also been released in 1996-97. The promoters have now tied up with a state food processing major, M/s Keventer Agro (P) Ltd. A comprehensive & well-formulated proposal for revival of the project is being prepared and will be submitted for fresh approval. Based on the report and on recommendation of State Nodal Agency (SNA), the project is expected to come up for implementation in near future. The promoters' team is now being restructured with Keventer Projects Ltd. as Anchor Promoter and the company as the Prime Consultant of the project of national priority and importance.

MFP, Dankuni will be implemented fully in phases in the near future. It will accommodate around 150 food processing units and cold chain facilities in large, medium and small sectors. Government of India has already provided Grant-in-aid to this project to set up common infrastructures like water supply system, cold storage and common infrastructures.

Food Park at Haldia, East Medinipur

The Food Park at Haldia was conceptualized in 1999. The Park was subsequently taken up for implementation. The Park had received approval from MoFPI as well as disbursement of Rs. 200 Lakhs to the banks for onward disbursement. Based on the progress of work and implementation, the amount will be disbursed to the implementing agency.

Jangipur Mega Food Park

- Area: 85.5 acres
- Developer: M/s. Jangipur Bengal Mega Food Park Pvt. Ltd.
- Location: Jangipur near Berhampore, in District Murshidabad, West Bengal, India
- Project Cost: Rs 115 Crore
- Brief Description:

M/s. Jangipur Bengal Mega Food Park Pvt. Ltd. (JMFPPL) has got approval from Ministry of Food Processing Industry (MoFPI), under Mega Food Park Scheme, to implement the only

Mega Food Park in West Bengal out of the 10 proposals accepted in the country. JMFPPL, a SPV has been formed for implementing the project in PPP mode. The project is being established on NH-34 at Jangipur near Berhampore. The Mega Food Park Project having received approval for grant of Rs. 50 crore shall include Core Processing Facilities, Factory Buildings for Micro and Small Enterprises (MSEs), Enabling Basic Infrastructure and Non-Core Infrastructure as per the Guidelines of Scheme for Mega Food Parks (MFPS) and in line with Detailed Project Report approved by Ministry of Food Processing Industries (MOFPI), Government of India.

The district of Murshidabad exists in the central part of West Bengal. Murshidabad has availability & hence enormous base of Horticulture. To add to the glory, the neighboring districts of Nadia, Birbhum, Malda, Burdwan and Dumka (Jharkhand) compliment Murshidabad in the abundance & availability of processable agro base and excellent connectivity. The catchment area for the produces in the vicinity, called the Zone of influence, would source and bring the produce to the Central Processing Park, located at the centre of the Zone.

18 Collection Centres (CC) and 5 Primary Processing Centres (PPCs) in Kaliachak in Malda, Beldanga in Murshidabad, Ayushpur in Burdwan, Rampurhat in Birbhum, Dumka Jharkhand and Katwa in Nadia are integral part in the concept of Mega Food Parks for sourcing the raw and primarily processed produce respectively to the Central Processing Park. This helps in establishing linkages between the Central processing park and the farmers living in the remote corners in the influence zone ensuring the supply of raw materials. The implementation of the project has commenced.

Shankarpur Fish Food Park

- Developer: BENFISH
- Location: Shankarpur, District- Purba Midnapore, West Bengal. It is around 185 km from Kolkata
- Area: 25 acres
- Project Cost: Rs 715.68 Lakhs
- Project brief:

This is an ISO 9001-2000 certified food park which centres around fishing. This is a first of its kind in India which will process, conserve and pack under scientific and hygienic conditions in keeping with international standards the aquatic catch landing at the fishing harbour. This bears a focus on exports of the valuable aquatic resources of the area. Thus facilities regarding auctioning the catch are also to be provided here.

This project has received a grant of Rs 178.92 lakh from the ministry of food processing and industries, Government of India, a grant of Rs. 315.16 lakh from NABARD and also has in

addition has state government's contribution houses, pre-processing sheds for auctioneers and bulk purchasers, ice plants, effluent treatment plant, quality control and analytic laboratory, ample parking area among others.

- Employment Generation

The food park will generate employment for about 3000 people in the spheres of carriage, auctioning, pre-processing activities etc. at the food park. Besides the direct employment it will also place out opportunities for indirect employment generation

Sultanpur Fish Food Park

- Developer: BENFISH
- Location: Sultanpur, South 24 Parganas, West Bengal
- Project Cost: Rs 8.01 Crore
- Project Brief:

This park provides hygienic infrastructure for handling and distribution of landed fish from the fish harbour. This Project also provides facilities to Marine Fishermen like Ice plant, auction Hall, Packing room, Diesel outlet etc. This Fish Food Park comprises facilities for 40 units.

The Park is primarily meant for assisting the marine sector. The infrastructure is primarily meant for providing a dedicated fish harbour as well as market yard for primary processing of the fish catch etc. The infrastructure when fully operational will be a major help for the fish belt of Kakdwip – sultanpur belt. BENFISH, a Corporation under Dept. of Fishery, Govt. of West Bengal is the implementing agency. MoFPI, has approved a grant of Rs. 200.28 lakhs. The Park was inaugurated by Hon'ble Minister of Fishery, Govt. of West Bengal on 19th February, 2006.

Kakdwip Fish Food Park

- Developer: BENFISH
- Location: Kakdwip, South 24 Parganas, West Bengal
- Project Cost: Rs 9.24 Crores
- Project Brief:

This park was developed with the intention of providing hygienic infrastructure for handling and distribution of landed fish from these fish harbor. This Project also provides facilities to Marine Fishermen like Ice plant, auction Hall, Packing room, Diesel outlet etc. This Fish Food Park comprises facilities for 80 units.

NORTH BENGAL

In North Bengal there are two food parks set up these are:

1. Malda Food Park
2. Siliguri Food Park

Malda Food Park

- Developer: West Bengal State Food Processing & Horticulture Development Corporation Ltd.
- Location: Malda, West Bengal. Located on the NH 34.
- Project Cost: Rs.16 Crores
- Area: 42 acres
- Project Brief:

This project is a composite Industrial Park for food processing industries in Malda district in north Bengal. The area has bountiful cultivation of mangoes, lychees, Vegetable etc. The Food Park has the processing facility for Mangoes, Lychees, Vegetable, Cereal, Milk, Dal, Spices etc. This food park has been developed under the Food Park Scheme of MoFPI. A grant amount of nearly 40 mn has been received and utilized in this project.

- **Facilities:**
  1. A Central facility Centre (CFC) has been provided. The CFC comprises of the common facilities of the Administrative block, Office spaces,
  2. Cold Chain
  3. Warehouse
  4. Comprises of about 22 fully serviced plots.

- **Infrastructural Facilities**
  1. Low maintenance concrete internal roads.
  2. Power supply and distribution system
  3. Potable water supply system.
  4. Drainage and sewerage system
  5. Street Lights and Area Lighting

Siliguri Food Park

- Developer: Siliguri Jalpaiguri Development Authority (SJDA)
- Location: Siliguri, District- Darjeeling, West Bengal
- Area: 35 Acres
- Project Cost: Rs 18 Crore
- Project brief:

This project is developed with an assistance of Rs 3 Crore from the Central Government and the balance was to be brought in by SJDA.

The food park would comprise facilities for warehouse, cold storage, effluent treatment plant, a 33 KVA power plant and administrative office block. The park is being planned for about 15 food processing industries. Facilities for future expansion have also been incorporated into this project.

Fruits

India is the second largest producer of Fruits after China. West Bengal is a major producer of fruits. In 2009, the production of fruits in West Bengal stood at 3.85 million tonnes. This abundant availability of fruits provides the state a competitive edge in the food processing industry.

Total production and demand in the state

Production of Fruits in West Bengal covers an area of 166.29 '000 Hectares with a total production of 2128.28 '000 MT during 2009-10. Out of a variety of fruits produced in the state, the principal fruits:

- Mango, Litchi, Pineapple, Orange, Banana and Guava
- Above five fruits share 75% of total area under fruits cultivation
- Above five fruits share 73% of total fruit production

There is a lot of confusion in the market place about processable and non-processable varieties of fruits and their availability. For example, West Bengal has a huge production of pineapples, but the units set up for processing of pineapples, can not get adequate raw material. At a gross level, processable varieties are those which are amenable for handling in machine operated conversations to value added products. Generally, in the case of pineapples, this means uniform sizes within close tolerances in terms of overall diameters, uniform core diameter and a reasonable consistency in flavor so that the ultimate products are reasonably consistent from batch to batch.

On the other hand, all other produce are really non-processable by machine or "table" variety. This does not mean they are inferior or inedible. They can also find good market as fresh fruits. They still need to be pre-processed to make them ready for the end market. And they can also be processed to a certain extent. In the case of pineapple again, they can be cut into bits and even sliced and suitably processed and packaged. In case the processor wants to use any semi mechanical aid, they can get such mechanical aids in India and from a host of small manufacturers in Europe.

Whether a fruit is processable or not depends on a host of factors, mostly related to methods of cultivation and planting materials used. Normally farmers do grow fruits for whatever they find a market for. If there is no requirement for processable varieties, farmers will not grow them as cultivation of processable varieties usually mean more care in cultivation and therefore more initial cost. That is why prospective users/ processors must work with local farmers much before the start of production in their units.

Processing: The fruit can be processed in a variety of manner to add value and shelf life to the produce. Such products include pulp, juice, slices and bits, pickles, sauces, squashes, concentrates, jams, jellies etc. Not every kind of fruit is converted into all the above categories.
Major players in the field of fruit processing in West Bengal are

- ITC
- Dabur
- Keventer Group
- Calypso
- Gita Fruit Products

- Malcos

There are many other smaller units. Not all of the above are necessarily doing well.

Mango:

Top five producing districts are:

Districts	Production (000 MT)	% of total state production
Malda	196.00	31.60
Murshidabad	135.00	21.77
North 24 Parganas	81.59	13.16
Nadia	57.52	9.28
Hooghly	39.00	6.29
Total	509.11	79.7

Source: Dept. of food processing and horticulture 2010-11

Varieties of Mangoes produce in large quantity are:

- Himsagar
- Laxmanbhog
- Gulabkhas
- Langra
- Fazli
- Aswina
- Gopalbhog
- Rani Pasand

Market:

- Markets in Murshidabad, Nadia
- Chitpur Market in Kolkata
- Contract cultivation reserves a fixed market and are supplied in bulk to the major traders
- Contract farming is allowed in many states in India, but not in West Bengal.

Litchi:

Top five producing districts are:

Districts	Production (000 MT)	% of total state production
Murshidabad	2.26	24.19
Malda	0.85	6.99
Nadia	0.74	8.88
North 24-pgs	0.71	6.95
South 24-pgs	0.46	4.65
Total	**5.02**	**73.8**

Source: Dept. of food processing and horticulture 2010-11

Varieties of Mangoes produce in large quantity are:

- Bombai' is the major variety

Market:

- Markets in Murshidabad, Nadia
- Chitpur Market in Kolkata
- Contract cultivation reserves a fixed market and are supplied in bulk to the major traders

Processing: The fruit can be processed in a variety of manner add value to the product. Such includes Litchi juice, litchi jam & jelly, Litchi pulp, canned litchi etc..

Pineapple:

Top five producing districts are:

Districts	Production (000 MT)	% of total state production
Darjeeling	3.98	104.03
Uttar-Dinajpur	2.54	74.24
Jalpaiguri	2.41	63.52
North 24-pgs	0.68	18.5
Nadia	0.55	16
Total	**10.16**	**78.9**

Source: Dept. of food processing and horticulture 2010-11

Market:

- Bhidannagar village in Silguri, West Bengal
- Export market in Nepal & Bhutan

Processing: The fruit can be processed in a variety of manner add value to the product. Such includes Pineapple juice, Pineapple jam & jelley, Pineapple pulp, canned pineapple etc..

Major Players:

- Druk
- ITC

Banana:

Top five producing districts are:

Districts	Production (000 MT)	% of total state production
Hoogly	4.49	82.65
North 24-pgs	4.1	80.12
Nadia	4	70
Jalpaiguri	2.22	48.7
Midnapore(E)	1.8	58.49
Total	**16.61**	**72.9**

Source: Dept. of food processing and horticulture 2010-11

Varieties of Banana:

- Attiakala',
- 'Bichkela-1',
- 'Bichkela-2'
- 'Hill Banana',
- 'Kalyani Local-3'

- 'Maricha' and
- Jhama Diara'

Market:
Bananas produced in West Bengal is consumed in the state and rest are distributed in markets of Patna, Ranchi, Raipur, Kolkata, Bhubaneshwar etc

Processing: Kaventers conduct training in banana cultivation and also support the farmers to produce export grade bananas. Rich in iron this fruit is a health supplement for all

Major Players:
- Kaventers Agro

Guava:
Top five producing districts are:

Districts	Production (000 MT)	% of total state production
South 24-pgs	1.72	30.15
North 24-pgs	0.82	13.6
Birbhum	0.73	9.1
Nadia	0.7	11.9
Bankura	1.8	58.49
Total	**4.58**	**50.8**

Source: Dept. of food processing and horticulture 2010-11

Varieties of Banana:
- 'Allahabad Safeda', '
- Khaja' (Bengal Safeda),
- 'Kafri',
- 'Teli',
- 'Bhagalpur' and '
- Baruipur'. 'Khaja' (Bengal Safeda)

Market:
- Guava produced in West Bengal is consumed in the state and rest are distributed through market channels to Bihar, Odisha, Madhya Pradesh etc
- Baruipur Market
- Chitpur Market

Seasonality in production of Fruits

Name of Fruit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mango												
Litchi												
Banana												

Pineapple												
Guava												

Blue: tenure of production during the year Orange: indicates peak season

Major markets in West Bengal

- Chitpur Market in Kolkata
- Bidhannagar Market in Siliguri

Cultivation scenario in West Bengal

Cultivation: Variety of fruits cultivated in diverse of climate in the state. Some require dry climate other require cold and moist and yet other would require tropical climates. As in case of Mango, an entire orchard can be taken on lease for the production period. During this time, guards are kept posted to avoid theft and premature falling of fruits. Banana plant as a whole is consumed; the leaves are used as disposable plates the stem as a vegetable and banana is of course the fruit. Guava in West Bengal is cultivated almost during the entire year and fertilizer dose is split into two and applied once in January and once in August.

Packaging at farm level:

- In gunny bag- guava, mango, bael, ber
- In cloth bag – guava, mango
- In bamboo basket covered with leaves – guava, mango, litchi, papaya
- Without any packaging – banana, pineapple, jackfruit
- Wooden box – litchi, mango
- Plastic crate – litchi
- Cushioning materials – newspaper or leaves of the same fruit, covering with newspaper or banana leaves.

Distribution:

Channel 1- To central market by

a) Wholesalers through contract sale

b) Commission agents

c) Wholesalers who buy directly from orchards/ local markets.

Channel 2- Farmers/ contractors with big orchards send their produce directly to the central market (about 5%)

Channel 3- Farmers/ contractors bring their fruit to local wholesale markets were many vendors and even some consumers come to trade.

Channel 4- Directly to exporter without passing through any middleman. Exporter assign their agents or collectors to procure fruit of a specific grade.

Channel 5- Directly to processing unit with prior agreement on size, quality and price.

New projects

Prominent investors in West Bengal's food processing industry include Pepsico (through Frito-Lay India). Del Monte Pacific Ltd is setting up a pineapple and mango processing plant with an investment of US$ 1 1 million while companies like Unilever and Nestle have expressed interest in setting up food processing units in the state.

Big names in marketing of Fresh & Processed Fruits

Fresh fruits are sold in local markets, mandis, and organized retail outlets. Processed produces are sold by all un-organized and organized retail outlets.
Some of the organized retail outlets in the state are:

- Spencers (RP Goenka Group)
- Food Bazaar (Future Group)
- Reliance Fresh,
- More (Aditya Birla Group),
- Arambagh

Research infrastructure required for Fruit processing

In the time of harvesting no scientific standards are primarily followed for determination of maturity Most based on experience of the person, some times change of colour (litchi), softness (mango), attainment of size (banana, jackfruit) whether the fruit is ready for consumption is determined.. Harvesting before maturity due to sudden market demand (festival) or to get higher price early in the season (litchi, mango), avoiding pest incidence after rains (litchi, guava) are basic drawbacks which results in Inferior quality- ultimate low market price.

Adopt the best practices

- Storage
  - ✓ Postharvest storage facilities
  - ✓ Collection centers
  - ✓ Cold chain
- Packaging
  - ✓ Special purpose containers to prevent damages
  - ✓ Protection from contamination
  - ✓ Not imparting any toxic substance
- Handling
  - ✓ Specialty handling tools and equipments
- Transportation
  - ✓ Freighters
  - ✓ Multimodal transport services
- Logistics service provider
  - ✓ Storage,
  - ✓ warehousing and

- ✓ material handling services transportation

Conclusion

Problems encountered by the pre-harvest contractors from farmers and due to lack of infrastructural facilities

- Lapses on the part of farmers in the management of orchard resulting in deterioration of quality of fruits
- Problems of natural calamities (theft of fruits, losses due to rains, pest etc.)
- Inadequate storage facilities at local place
- Packaging problem (costly packaging materials and non- availability of skilled labour)
- High transportation cost and non-availability of refer van
- Non-availability of graders
- Non-availability of pre-cooling facilities

Constraints in implementing post -harvest practices:

- Numerous intermediaries
- High level of wastage (30-40%)
- Lack of transparency – prices, availability, demand, customer preferences
- Poor infrastructure – storage, packaging, transportation/ no cold chain
- Poor linkage in the marketing channel

Way Forward:

- Production technology on modern lines needs to be demonstrated to the growers on a larger scale.
- Farmers need to be educated about export requirements and international quality standards.
- Processed fruits in the form of jam, jelly, pickle, canned fruits etc are available in the market. What is required increase in their scope and scale.
- Thus a Fruit Processing unit is proposed in Malda, preferred location: On the 4 acre walled premises of Malda Mango Co. Op. Society Limited, Malcos, on rent, lease or any other suitable basis. Depending on the seasonality and availability of the fruits, puree, pulp, beverage, chutney, jam, jellies, slices, pickle, sauce, squashes, concentrated juice etc can be processed for a variety of Fruits. If there is variety, this state of art processing unit with modern machines will run throughout the year and will be a viable proposition compared to units like Gita Fruit Products and existing Malda Mango Co. Op. Society Limited, Malcos.
- Another new unit can be made in Malda Food Park and one each in Darjeeling and Murshidabad districts.
- Banana holdings in India are very small and it is not possible to install cable ways for transporting bunches from field to pack-houses to avoid bruises. Under these circumstances, groups of farmers need to be encouraged to have system of make shift pack-houses, to cut-hands from bunches in the field itself and send these hands to central pack-house for further processing /treatment and packing.

Most modern pack house facilities need to be created, to begin with, in Nadia district. Preferred location would be Chakdaha on NH-34 which is well connected to other parts of the state.

- Market infrastructure should be improved through setting up of storage facilities, improvement in the road net work, cold-chain facilities, airport and port infrastructure for shipping and cold storage in public private partnership.

- The well-developed post-harvest infrastructure facilities even after allowing for 10 per cent post-harvest losses of total fruit production, will make available an additional 5 million tones of fruits for domestic and international markets. Market surveillance and information, export quality standards, terms of global trade, export ventures in partnership with exporters and linkage with export houses should be strengthened.

- A very big problem in West Bengal for the processing sector in the small scale is lack of any packaging material. For example there is a severe shortage of **"**tetra pack**"** packaging units. Few people realize that **"**Tetra pack**"** is a brand name of an aseptic packing machine manufactured by a Company with the same name. Another example is the Xerox machine, which is essentially a reprographic machine and is manufactured by a host of Companies. But in popular terms, they are known in the market as Xerox machine, irrespective of the manufacturer. Similarly several European manufacturers make **"**tetra pack**"** or aseptic packing machines of various sizes and capacities. Tetra pack is a very big who essentially make very large capacity machines. They are also very expensive and totally beyond the capacity of SSI units, even in a cluster. Being a very big Company, Tetra Pack could afford an office in India and spread the word that they only manufacture such machines. What a group of SSI manufacturers can afford and should therefore buy are those manufactured by other European Companies. Unfortunately none of them have offices or marketing persons in India. The government must make these SSI units aware of these manufacturers and their product range so that a group of SSI units in a cluster can buy them. Even a new Company can buy such a machine and offer services to a host of SSI units.

- Such machines are urgently required in Malda and Murshidabad district.

- Finally, prospective investors of large units must realize that just because there is a lot of produce in a certain location, they are not necessarily processing variety or may not meet their specific requirements. They should start working with farmers and cultivators well before the start of production to ensure that they get the variety they desire when production starts.

Sector wise analysis

Dairy

The Directorate of Dairy Development, Govt. of West Bengal deals with the collection of raw/chilled milk from the Co-operative Milk Unions in West Bengal, process the milk in its dairy plants, sell pasteurized and homogenized milk and other milk products through its own network of booths, Suravis, agents and distributors. With the implementation of Operation Flood Program in West Bengal in the mid-1970s, the extension, procurement and other farmers related activities on dairy development have been taken over by the Cooperative Sector i.e. West Bengal Co-operative Milk Producers' Federation Ltd which was established in 1983 under Government of West Bengal following a three-tier structure of Anand pattern of milk cooperatives.

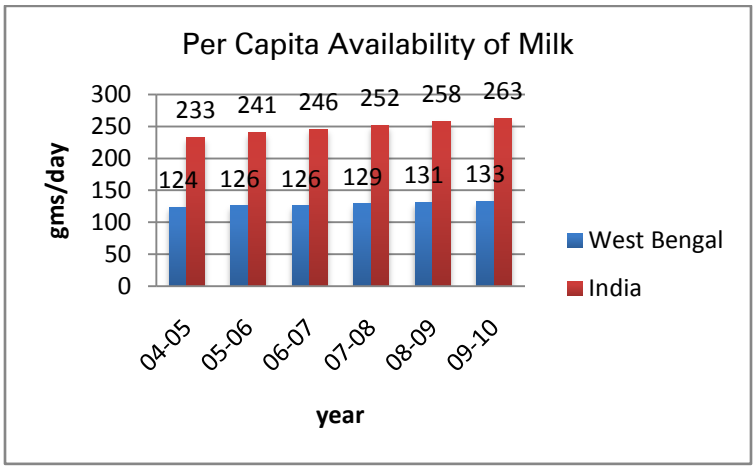
Total production and demand in the state

The total production of milk in 2010-11 was 4471 thousand ton which is 3.67% of total India production. Even though per capita availability of milk in the state has increased in the last 20 years, West Bengal is still behind all India average per capita milk availability.

Per Capita availability of milk – West Bengal (gms/day)

91-92	95-96	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
120	130	116	120	120	120	124	126	126	129	131	133	137

Source: Animal resource development Dept. West Bengal, 2010-11



(*Source – Basic Animal Husbandry Statistics 2010)*

Major production areas in the state

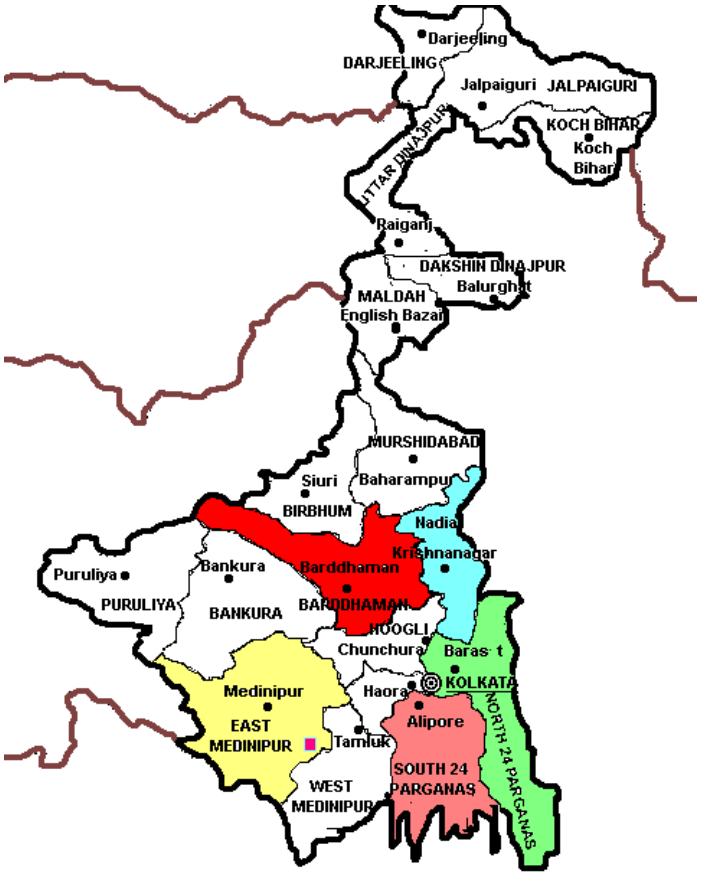
According to West Bengal Co-operative Milk Producers' Federation Ltd's 2011 Status Report Bhagirathi Milk Union in Murshidabad district, on an average procured 84.60 TKPD of milk which is

highest among all 13 milk unions in West Bengal. After Bhagirathi, Ichhamati Milk Union in North 24 Parganas and Kishan Milk Union in Nadia procured 48.40 and 45.39 TKPD everyday respectively.

Top Five Milk producing districts in the state:

On the basis of daily average procurement by their respective milk unions, top 5 milk producing districts are

Name of the District	Daily Average Procurement (in TKPD)
Murshidabad	84.60
North 24 Parganas	48.40
Nadia	45.39
Medinipore	40.04
Burdwan	23.01



Milk in West Bengal	
	Highest producing district
	2nd Highest producing district
	3rd Highest producing district
	4th Highest producing district
	5th Highest producing district

Source: Animal resource development Dept. West Bengal, 2010-11

Cultivation scenario in West Bengal

During the year 2010-11 on and average 385.19 TKPD milk was procured from various District Milk Unions covering 1869 functional socities and 2.57 lac farmer members. Major portion of the procured milk was supplied to different urban dairies and part of the milk was marketed in local towns and Kolkata as processed milk and milk products.

The Federation is also implementing Women Dairy Cooperative Project (WDCP) funded by the Ministry of HRD, Govt. of India and thereby empowering the women economically and socially. Already 599 Societies have been organized with 57,591 women members pouring on an average 39361 kgs. of milk per day.

New projects

Extensive efforts have been adopted to increase production of raw milk and milk based processed items. For this purpose, over the years government had implemented various dairy sector related projects in Hooghly, North 24 Parganas, Howrah and other districts.
A 3.56 crores new project for production of milk, paneer, ice cream, ghee is on its way to completion in Salboni, West Medinipore.
Bengal Nestors' Ltd has set up an integrated dairy project costing 5.02 crores at Ausgram, Burdwan.
M/s Bengal Dairy Ltd. has been formed with a project to set up a 50000 litre per day Dairy at Debra, West Medinipore.
The importance, however, of the milkmen's cooperative societies in increasing milk-production and bettering their condition is immense.

Big names in Dairy processing

There are many large and small scale dairies operating in various districts in West Bengal. Out of which some of the major players in West Bengal are Mother Dairy, Metro Dairy, Red Cow Dairy, Go Dairy, Bhagirathi Dairy. They sell various processed milk item along with raw packaged milk.

Types of processed Dairy item available in the state

Cream, Powdered milk, Paneer, Ghee, Yogurt, Ice cream, Lassi, Chach, milk of various standards (full cream, toned, double toned, skimmes, UHT toned) and a whole lot of other varieties are processed and consumed in the state.
The state of West Bengal offers extensive scope in the area of processed milk products as a major part of the demand for value-added milk products is presently met by imports from other States. This leaves enough room for investors to invest in value added fish products in the state as compared to its counterparts in other states of India.

Infrastructure Scenario:

The federation's association in infrastructure consists of:

i. 6 lakhs Litre per day (LPD) Mother Dairy Plant at Dankuni, Hooghly.
ii. 1 lakh LPD plant at matigara, Darjeeling.
iii. 1.5 lakhs LPD plant at Berhampore, Murshidabad.
iv. 4 lakhs LPD Metro Dairy plant at Barasat, North 24 Parganas.
v. 126 chilling plants having capacity of 311500 litres per day.
vi. Four dairy plants having capacity of 4000 LPD (expandable to 10000 LPD) each at Bolpur (Birbhum), Raigunj (Uttar Dinajpur), Belguma (Purulia), and Raipur (Bankura).
vii. A total of 116 Bulk Milk Cooling unit (capacity: 183.5 TLPD) and 20 Chilling plant (capacity:128 TLPD) are in the state.

Suggestive measures

Status

- Dairy products produced in the state include homogenized & pasteurized liquid milk, butter, ghee, paneer, khowa, yogurt, lassi, ice cream and sweetmeat.
- Production of processed liquid milk in the state is mainly done by the units in the cooperative and joint sector, although some units in the private sector have come up during the past few years to meet the growing demand of processed milk in the state.
- Mother Dairy Kolkata, Amul and Metro Dairy are the three major units in the state.
- These dairies in general produce packaged milk (cow milk, toned milk & double toned milk), butter & ghee. Mother Dairy Kolkata produces paneer, flavored yoghurt & sweet curd. Metro Dairy produces ice cream in addition.
- All the dairies and ice cream manufacturing units are in the organized sector, while the tiny & cottage units producing ghee, channa and whey are in the unorganized sector.
- UHT treated milk with long shelf life is not produced in the dairies of the state and also there is no facility for production of coloured & flavoured milk, infant milk food, melted food, skimmed milk powder, condensed milk and cheese.

Problem

- Availability of raw milk being inadequate in the state.
- There is a wide variation in quality of milk with respect to protein and SNF content.
- Skimmed milk powder, an important ingredient in manufacturing packaged milk and ice cream is not produced in the state.
- Milk chilling facilities are still inadequate constraining sourcing of milk from remote areas.
- The market of processed liquid milk is still limited to urban and sub-urban areas.

Need of the hour:

- Encourage setting up of Chilling plant in every district of the state with capacity ranging from 10-20 TLPD to mobilize raw milk from farmers.
- Better pricing of fresh milk which may lead to management of live animal which in terns would produce more milk.

Sector wise analysis

Fish

West Bengal has been able to secure the leading position in fish production for seven successive years and has been rewarded accordingly by the Central Government as best productivity award. West Bengal is the only state in India, where fishes have been cultivated in every kind of water bodies i.e. brackish water, sweet water, sewage water and marine water as well.

Total production and demand in the state

The total production of inland fish was 15.30 Lac ton and marine fish was 2 Lac Ton. Apart from the fact that they are mainly consumed in the state, a large amount of inland and fish is exported to Delhi, Uttar Pradesh, Madhya Pradesh, Bihar and other adjoining states. Export of Marine Fish beyond boundaries of the country earned a handsome revenue of Rs.700 crore in the year 2009-10.West Bengal occupies the 4th position in the country in terms of export of sea food products. Fishes are exported primarily through Kolkata and Haldia Port to Japan followed by Vietnam and China. Exports to Japan only aggregates to a total annual revenue of Rs.650 crore. Out of the total exports 90% are shrimps and the rest includes ornamental fish, crab, fresh water prawns.

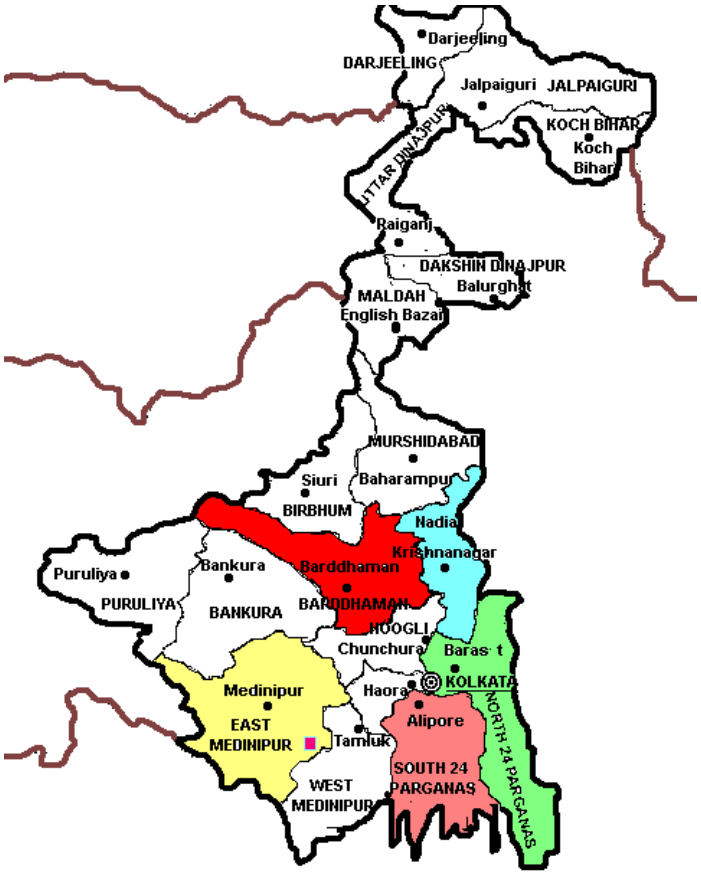
About 78% of the fish catch in the state is marketed as fresh or chilled and forms staple food for the population and inland landing centres. About 6% of the catch is used for drying and curing. Frozen fish production accounts for 12% and about 4% is used for reduction to fish meal. In the wake of changing lifestyles, value added fishery products of different descriptions as 'convenience food' is also gaining popularity in the markets. The range of value added fishery products processed in the country include extruded products, battered and breaded products, surimi and derivatives, pickles and curried products in restorable packing.

Major production areas in the state

South 24 Parganas accords the highest production of inland as well as marine fish aggregating to a total value of 3.3 Lac Tons in the year 2009-10 followed by Purba Medinipore, North 24 Parganas, Burdwan and Nadia. However Marine fish is predominantly available in South 24 parganas and Purba Medinipore only.

The current availability of fish and per capita consumption at 9 kg the State is facing a shortage of over 90 thousand tonne. The fish requirement of the State by the end of 2010-11 had been estimated at over 14.71 LT assuming the total population. The demand will be more in view of the increasing fish consumption.

Top Five Fish producing districts in the state:



Fish in West Bengal	
	Highest producing district
	2nd Highest producing district
	3rd Highest producing district
	4th Highest producing district
	5th Highest producing district
Proposed Fish Processing Park on NH-6 between Debra-Panskura-Kolaghat	

Source: Dept. of Fisheries, West Bengal

Following is the table indicating the total water body directly/indirectly under fish cultivation. This also includes Tanks and Ponds.

Sl. no.	Item	Area (In ha)	Percentage over total
1.	Culturable	2,04,911.99	71.40
2.	Semi derelict	55,162.95	19.20
3.	Derelict	26,925.06	9.40
	Total	**2,87,000**	**100.00**

Source: Dept. of Fisheries, West Bengal

Seasonal variation in production of Fish

Inland fish can be cultivated throughout the year with little extra support during summers when water levels are majorly affected. However marine fishes in the inshore waters are linked to the seasonal variations Increase in temperature during summer, induces faster growth in shrimps but reduces size maturity resulting in low fecundity and low production. For cage culture operations of fish, the higher temperature is not favorable.

Major primary markets in West Bengal

Some of few big wholesale fish market are:

- Howrah fish market, near to Howrah station, largest fish market in eastern India
- Diamond harbor market, biggest sea fish market in West Bengal
- Wholesale Markets in Kolkata- Baithakkhana Market, B. K. Pal Market, Bantala Fish Market, Bagha Jatin Bazar, Chingri Ghata Fish Market & Orphangunj Market.
- Wholesale Market in 24 Parganas (South): Malancha Market specially for shrimp
- Wholesale Market in 24 Parganas (North): Patipukur Market for a variety of fishes.

Cultivation scenario in West Bengal

West Bengal has been able to create a stir in the production of fish seeds in so far as inland fishery is concerned. 75 per cent of the total demand for fish seeds are met by West Bengal alone.

To induce greater utilization of modern and scientific technology in pisciculture, training is being imparted at the State, district and grass-root levels to fishermen in Inland fisheries. The training in fishing in deep sea with the help of mechanized boats and other technological devices has generated much enthusiasm in fishermen. The minor fishing harbour at Shankarpur in Midnapore district, Fresergunj in South 24-Parganas and the Barge Jetty at Namkhana are landmarks in the effort to create safety and certainty in a fisherman's' life.

As many as 12000 dwelling units as well as ponds and tanks area of 2351,48 hectares have been pressed after dredging, in cultivation of fish Model fishermen villages each of which contains 100 dwelling units, community halls, credit societies, roads, sanitation etc. have been constituted in six districts of the State.

New projects

Extensive efforts have been adopted in the production of prawns both in sweet and saline water-beds. A 100 crores project for culture of prawns is on its way to completion with the financial aid of the World Bank at the Meen-Dwip, which stands opposite to Haldia, for Prawn culture. The hill-stream fishery at Jhora in the hilly region of Darjeeling is the first of its kind in the country. Culture of fish is also being conducted in sewage-water an area measuring of 4000 hectares at the outskirts of Calcutta. The importance, however, of the fishermen's cooperative societies in increasing fish-production and bettering their condition is immense.

Big names in Fish processing

There are around 52 M&SSE operating out of Kolkata, Howrah, 24 Parganas North & South. Out of which major players approved by the Export Inspection Council are IFB Agro Industries limited,

Unitriveni Overseas, Nezami Rekha Seafoods Pvt. Ltd, Coreline Exports, Calcutta Sea foods Private Ltd, Elque & Co. Bela Park are a few to name. Out of the 21 Fish and fish processing units approved in the eastern region 15 are located in West Bengal.

- The first ever sea food processing zone was flagged in the state of West Bengal in Chakgaria 24 Parganas (South). This unit has 10 fully export oriented operational units
- Fish Processing Centres at Junput
- Dry Fish Farm at Junput and Haripur

Types of processed fish available in other states

Frozen shrimp, Frozen lobster, Frozen cuttle, Frozen squids, Canned shrimp, Dried fish, Dried shrimp, Shark fish,fish maws, fish paste, fish pickle and a whole lot of other varieties are processed consumed and exported from other parts of India. Major exporters of fish are Kerela, Karnataka, Goa, Maharashtra, Gujrat, TamilNadu , Andhra Pradesh and Odisha. However, in West Bengal Fish is processed and sold or exported in the following forms:

- Fresh Fish
- Dried Fish
- Processed and Canned Fish, Frozen(IQF) shrimps, canned shrimps/prawns, lobsters,
- Fish paste & fish pickle
- Fish Seed

This leaves enough room for investors to invest in value added fish products in the state as compared to its counterparts in other states of India.

Cold Storage Scenario:

Existing infrastructure:

Location	Number	Capacity (MT)
24 Parganas (South)	1	300
24 Parganas (north)	3	390
Kolkata	19	2495
Total	23	3185

Source: Dept. of Agri-marketing and state marketing board, WB.

Considering 30 days cycle the existing facilities can accommodate 0.39 lakh MT which accounts for 19% of total marine fish production.

Five cold storages sanctioned under MoFPI are:

Name	Project cost (Rs)	Capacity in Ton	Status
A.K.J Cold storage	27,51,000	200 MT	1st installment received
Milsha Sea product	50,00,000	250 MT	2nd installment received

IFB Agro Industries Ltd	32,54,000	225 MT	1st installment received
S.D. Heavy sea food	47,95,000	250 MT	1st installment received
Z.A.Sea food Pvt Ltd	50,00,000	250 MT	1st installment received

Source: MoFPI

Marketing of processed fish

In west Bengal processed fish are available in two forms:

- Frozen fish which are mainly prepared for export purpose
  - More than 90% contributed by shrimp
  - 10% contributed by Pomfret, Cat fish, Hilsa

- Ready to eat, ready to cook & ready to fry items from
  - BENFISH: It has mobile and stationary counters to sell various ready to eat products. However it only depends markets of Kolkata.

  - IFB: The Company with its different marketing strategy from BENFISH is able to serve greater market. It prepared ready to cook products and these products are available in sub urban areas also. It supplies product to local restaurant, interest kirani shops with frozen facilities. However the market is limited by geographical boundary of south Bengal.

  - TRIVENI: The Company supplies variety of fishes to hotels and restaurants on contract basis. Their products are not likely available in stores. They prepare itemized value added fish product for specific comsumption.

Research infrastructure required for Fish processing

Like in Andhra Pradesh, trawlers used in sea fishing are well equipped with GPS system to bring back as much as double the catch compared to any wooden trawlers in West Bengal. This leaves enough potential for new technology to be used to enhance the quantum of catch which will in turn control the expenses.

Enhanced modern techniques that can be developed and used in the state, which can give rise to variety in fish cultivation. Inland water fish cultivation has a lot of scope. Data suggests that around 40% of the fish consumed in North Bengal, Malda, and Murshidabad are bought in from Andhra Pradesh. Rohu, Katla are common varieties which can easily be cultivated in West Bengal to meet the state consumption.

Fish Feed manufacturing is not practiced in large scale resulting in scarcity and in the present scenario fish seed is bought from Andhra Pradesh.

Due to lack of infrastructure, processing of fish other than shrimps is not readily done in the state. Fishes have to be sent to Kerela for processing and value addition. Improvised units for proceeding fish can be built so that all varieties of fish can be processed in the state which will in turn earn revenue.

Conclusion

Fish processing industries had progressed immensely in the state. Some of the major attributes that were responsible for such progress include:

- Better variety of seeds for Fish cultivation
- Newer and more advanced Fish farming technologies
- Proper training facilities provided to the Fishermen
- Enhancement of safety measures and financial assistance to the rural Fishing industries

For development of the sector some of the suggestive measures are:

1. Setting up of cold storages under private initiatives for sea fish preservation in the districts of:

   - East Medinapur with capacity of 500 mt
   - South 24 Parganas with capacity of 1000 mt
   - North 24 Parganas with capacity of 500 mt

2. Setting up of cold storages under private initiatives for sweet water fish preservation in the districts of:

   - Nadia with capacity of 500 mt
   - Hooghly with capacity of 500 mt
   - Howrah with capacity of 500 mt
   - Burdwan with capacity of 500 mt
   - North 24 Parganas with capacity of 300 mt
   - South 24 Parganas with capacity of 300 mt

3. Upgraded metal body trawlers/ vessels can also be equipped with cold store facilities which can store fish a freezing temperature during the length of the voyage.

4. Issuance of special permission for free movement of fish truck within the city area

5. Setting up of Fish Park: It is observed that the Government of India has accorded approval to a number of Fish Processing Parks across the length and breadth of the country totaling to a sanction of Rs. 34.57 crores. Out of this till the available data only Rs. 2.08 crores has been approved in West Bengal. This leaves enough room for further sanction in this state. A Fish Processing Park with all amenities such as cold storage facilities, processing units, and all supporting infrastructure strategically located along the NH-6 between Debra-Panskura-Kolaghat in Purba Medinipur District. For good connectivity prospects along this area, it will become a hub for fish processing and trade.

6. Ice producing units in Medinipore and North & South 24 Parganas, do not use food grade metal for freezing of ice block. This ice is used to preserve fish and thus comes in direct contact with it. Such containers should be replaced with food grade stainless steel which can prevent fish from getting contaminated.

7. The water for this freezing of ice should be treated to permissible level and each such unit should have a water treatment plant

8. A scheme/ package with government assistance should be framed to support the ice manufacturing units and water treatment plants.

Sector wise analysis

ONION

Onion *(Allium cepa)* is one of the important commercial vegetable crops grown in West Bengal. It is widely grown in the district of Hooghly, Medinapur (W), Nadia, Murshidabad and Burdwan mainly by small and marginal farmers. It has very good commercial value.

Total production and demand in the West Bengal

West Bengal has 21.70 thousand Hectares of land under onion cultivation, where the production is of the tune 304.60 thousand metric tonnes with a yield of 14.04 Tonne per hectare according to data for the year 2011-12. The per capita consumption of West Bengal is around 11 Kg/ annum.

West Bengal had been deficient in Onion production, hence a step was taken by the West Bengal government known as "onion action plan" in the year 1999. The West Bengal Agricultural Department through this examined the feasibility of onion cultivation in the low rain districts of the state like Purulia, Bankura and dry areas of Midnapur, in an effort to make the state self sufficient in onion production. Even steps were taken up to study the possibilities of growing onions in the rain prone areas in West Bengal.

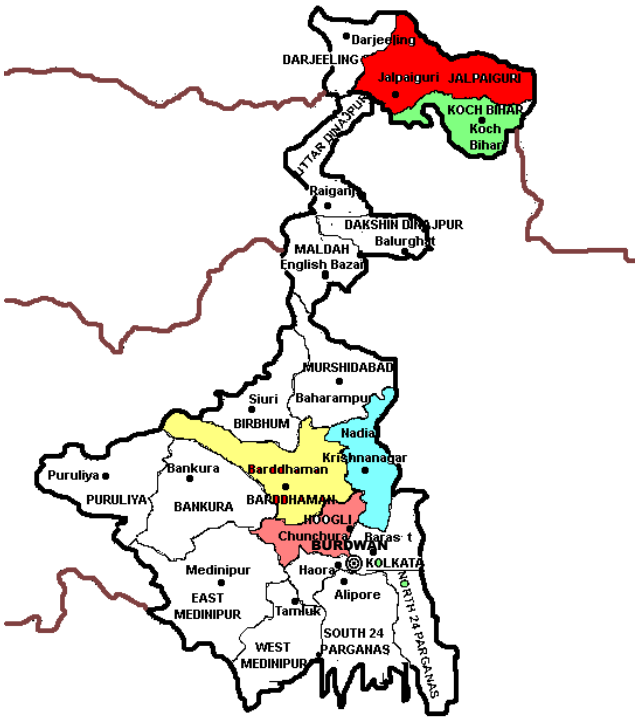
Major production areas in the state

The major production area of Onion in West Bengal is the Hooghly District, where about 2.62 thousand hectares of land in under onion cultivation. Total production of onions from Hooghly is 57.21 thousand MT (19.19%) in the year 2010-11. The Major variety grown in the state is Sukhsagar Variety.
Besides Hooghly all the 17 districts of West Bengal have onion production but the lowest production is in the district of Darjeeling. Though other districts in high rain regions also grow onions to some extent during the season, mostly these are for the local and household consumption.

Onion Seasons in West Bengal

Sl. No	Season	Time of Sowing	Time of Transplanting	Time of Harvesting
1.	Kharif Season	June-July	August-September	November-December
2.	Late Kharif Season	August-September	October-December	February-March

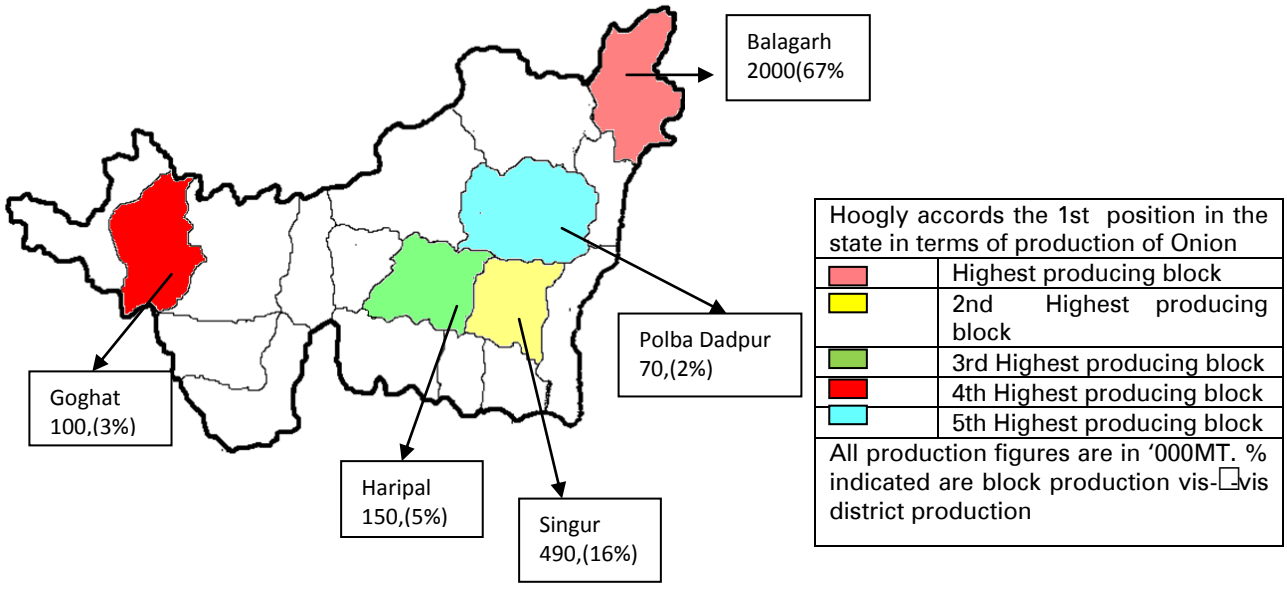
Top Five Onion producing districts in the state:



Onion in West Bengal	
	Highest producing district
	2nd Highest producing district
	3rd Highest producing district
	4th Highest producing district
	5th Highest producing district

Source: West Bengal Horticulture Board

The highest Production area for Onion in West Bengal is Hooghly. The top five growing blocks iin Hooghly are as follows:



Hoogly accords the 1st position in the state in terms of production of Onion	
	Highest producing block
	2nd Highest producing block
	3rd Highest producing block
	4th Highest producing block
	5th Highest producing block
All production figures are in '000MT. % indicated are block production vis-□vis district production	

Source: District Horticulture office.

Seasonal variation in production of Onions

Onion in West Bengal is grown in the Kharif and Late Kharif Seasons, where the leading months are November – December and May-June. However the produce during the Rabi season is also considerable.

Government, on experimental basis, has ventured to identify 500 plots of 10 cotta each in five rain-prone districts such as Burdwan, Maldah, Murshidabad, Nadia and North 24 Paraganas for cultivation of onions to make the onions available round the year.

Since heavy rain is not favourable for growing onions, Government has also taken steps to look into the dry areas of Purulia and Bankura and dry regions of Midnapur for introducing the cultivation there on commercial basis.

Storage Scenario:

For storage of onions, no separate storage have been built yet in West Bengal due to prohivitively high costs and technical feasibility. Considering low prices of onions, expensive storage models threaten viability.

Case Study: Balagarh onion storage house

In the District of Hooghly, there is Block-Balagarh which has a unique storage house with nominal capital investment of 2 Lakhs to 2.5 Lakhs only. They have developed a unique concept for storage of onions. Storage house have been built from Bamboo with Bamboo columns on the internal side. Onions along with the dried shoots are bunched together into groups and tied around these Bamboo columns, the onion bulbs are exposed to the outer side.

Onions – commercial aspects

Onions can be marketed in the following forms:

- Dehydrated onions are also used for exports.
- Onion is processed and sold in the form of onion puree which can be used as a spice in cooking, as a condiment for meats, as a side dish, or it can be converted into a main meal that resembles a soup or stew.
- In the regions of Bankura and Purulia, through means of well irrigation, farmers sow onion seeds, when these grow into saplings, they are sold as saplings which are replanted at adjacent parts of Bihar.
- Due to the medicinal value of onions, it finds usage in treatment of various problems as relief from thirst and mitigates the effects of the sunstroke, overcoming fatigue and exhaustion etc
- Dehydrated White Onion in Powder Form is hygienically processed to ensure purity and safety of usage. Dehydrated White Onion is used in variety of food items to add the flavor and taste of onion.

Suggestions

- At least 10 storage house, 2 each in the top five districts need to be set up
- Capacity of the storage house can vary from 1500 MT to 2000 MT.
- A onion processing unit can be set up in Hooghly district in the proposed Mini Food Park
- Balagarh Model of Onion storage can be followed widely.

Sector wise analysis

Potato

West Bengal ranks second in potato production after Uttar Pradesh, the leader in potato production, in the country. Both of them collectively contribute more than 50% of the country's production of potato. So any minor deviation in the production of these two states largely affects the total Indian production and market prices. Although India holds the 5th place in cultivation after China, Russia, Poland and USA its share in export is very low. In world context, potato export from India does not stand mainly due to high prices and poor quality and inconsistency of produce. On the other hand, India has a dedicated potato research institute in the name of Central Potato Research Institute (CPRI) located in Shimla, Himachal Pradesh. HP is not one of the two major cultivation states.

Total production and demand in the state:

The total production of potato was 13391.24 ('000 tonnes) in the year 2010-11. Potato export, from India is negligible. It is estimated that 61.47% potato production are used for table purpose, 21% as seed, 0.5% processed and only about 0.03% are exported while about 17% are lost in post harvest handling, marketing and storage. The per capita consumption in the state was found out to be 35kg per annum. After meeting local consumption, keeping aside potatoes to be used as seeds and for processing nearly 54% (i.e. 7247996MT) at present is surplus. This is sold in other states or wasted. Potato cultivation has yearly boom and bust cycle. One year there is bumper crop and prices fall to levels which are not remunerable for the farmers and cultivators. This leads to very severe problems for farmers who have to throw away a large portion of their produce as the cold stores get full and it becomes un-remunerative to even store them. Next year, the farmer's plant potato in less area and the volume decreases and the price escalates rapidly. This cycle goes on regularly and no government tries to correct the situation. There is no mechanism to stabilize the volume or price.

Major production areas in the state:

Hooghly accords the highest production of potato aggregating to a total value of 3434.459 '000 MT in the year 2009-10 followed by Paschim Medinipore, Burdwan, Bankura and Jalpaiguri.
The per capita consumption has been recorded at 35 kg per annum in the State.
Following is the table indicating the top five districts in the state of West Bengal which contribute to the majority of potato production in the state:-

Sl. no.	District	Production ('000MT)	%age of state's production
1.	Hooghly	3434.459	24.82
2.	Paschim Medinipore	2448.136	17.69
3.	Burdwan	2268.242	16.39
4.	Bankura	1350.135	9.76

Sl. no.	District	Production ('000MT)	%age of state's production
5.	Jalpaiguri	904.993	6.54
	Total	**10405.965**	**75.20**

Source:Directorate of agiculture, Govt of West Bengal, 2010-11

The table clearly indicates that almost 75% of the state's potato is produced in these five districts.

Seasonal variation in production of potato:

Potatoes produced in the plains are grown as a winter crop on irrigated lands usually in rotation with cereals. Most of the crops are harvested between January and March, with a smaller, early crop harvested in November & December. Between April and October potato demand is met mainly through storage, except for a relatively small summer crop harvested in plateau and hilly regions. Domestic potato prices follow seasonal production trends, rising rapidly following the end of harvest, and falling again when the next year's crop is harvested.

Major varieties of potatoes:

According to CPRI, major varieties of potato grown in the state are given in the table below:

Variety	Suiltability
Kufri Chandramukhi	Flakes & Chips
Kufri Jyoti	Processing
Kufri Ashoka	Table Consumption
Kufri Pukhraj	Table Consumption
Kufri Chipsona-1	Chips & French fries
Kufri Chipsona-2	Chips & French fries
Atlanta	Chips & French fries

Source:Directorate of agiculture, Govt of West Bengal, 2010-11

A lot of industry users dispute the above usage table.

Marketing scenario in West Bengal

The major centers for potato trading is concentrated in the districts of Hooghly, Burdwan, Midnapore (W) & Howrah.

The National Agricultural Co-operative Marketing Federation of India Limited (NAFED) is the nodal agency. They, in conjunction with state agencies, are responsible for implementation of market

schemes for potato. Co-operative Marketing Societies & commission agents play an important role in potato marketing in India.

Different types of transport move potato in West Bengal. The main mode of transportation is by roads using trucks. Due to poor transport facilities in rural areas, over intervention of commission agents or middlemen, lack of storage facilities and poor post harvest management, farmers are hit and their losses are piling up every day.

After harvesting of the crop, commission agents from other states come and purchase directly from the farmers in our state. Then the local traders grab a percentage from the remaining production and store them in the cold storages where the produce is kept for three long months. During this time a huge fluctuation in price can be observed. The remaining produce, after acquisition by the local traders is utilized for local consumption. In spite of the surplus that exists in the state, potatoes have to be imported from other states like Punjab & UP during the lean season.

Big names in potato processing

In the Rs 19 billion branded(organized) snacks market, constituting over 40% of the market by value, Frito-Lay is estimated to command a market share of 45%, followed by Haldirams at 27% and ITC at 16%. There are several other small scale and cottage industries.

The major players in the state of West Bengal are Pepsico's Frito Lays' India, Gee Pee Food Products & Pailan Food products. All of the above mentioned units are engaged in manufacturing of potato processing & allied products in the state and two out of the three players have their unit in the Hooghly district which clearly puts forward the fact that they are well aware of the sources of raw materials. They are trying to tie up with the farmers in order to meet their demand of potatoes.

Frito Lays has tied up with the potato farmers in Hooghly for procurement of processable varieties of potatoes. Their main requirement is that farmer/farmers should have a minimum land holding of 40 bighas. Pepsico will provide all the raw material starting from seeds, fertilizers & pesticides. In return, the farmers have to produce according to the standard mentioned by the company and sell the produce at a pre-fixed price to Pepsico. This has helped both the parties to a large extent as the farmers are getting the appropriate amount of remuneration and the company is getting the variety required for their unit.

Types of processed potato items available:

In West Bengal Fish is processed and sold or exported in the following forms:

- Potato chips & wafers
- French Fries
- Potato Starch
- Potato Powder
- Flakes and Pellets

This still leaves enough room for more investors to invest in value added potato products in the state as compared to its counterparts in other states of India. Only the prospective manufacturers must follow the route modeled by Pepsico.

Cold Storage Scenario:

Existing infrastructure: There are 414 cold storages with an installed capacity of 5,746,603 MT. However many of them are ancient and energy inefficient. They are getting more and more unviable as power cost increases. The top five districts where the concentration of cold storages is the highest are given in the table below, which are in line with the highest five producing districts:

Location	Number	Capacity (MT)
Hooghly	130	1655234
Burdwan	99	1297948
Medinipur(W)	66	1168565
Bankura	44	708421.4
Jalpaiguri	18	261075.2
Total	357	5091242.79

Source: Directorate of Agri-marketing and state marketing board of WB.

The remaining 57 potato cold storages are scattered in the districts of Birbhum, Coochbehar, Uttar Dinajpur, and Murshidabad etc. having a capacity of 655360.70 MT.

The installed capacity of cold storages in the state is not sufficient for storage of the huge amount of production of potato as only 42% of the total production of potato can be stored in these storages. There is an even more urgent need to modernize the older cold storages. Lacks of cold storages help middlemen and traders in manipulating prices of the commodity in the lean months of the year. Some malpractices lie charging exorbitant prices for storage space & fictitious booking of spaces to create an artificial glut force farmers to part with their produce at an un-remunerative price.

Marketing of processed potato products:

All the major players follow almost the same pattern of marketing their items. They have their own dealers under whom there are distributors who take the products to a more micro level where local vendors are present. These local vendors take the products to the shops or outlets from where the consumers can avail the products. The distribution pattern is similar to the one for fruits.

Conclusion

Considering the importance of Potato in Indian Agriculture and its ability to address the food security issue, following measures are required for sustainable potato production:

- Improving productivity through high quality seeds
- Development of advanced varieties with high yielding capacities and can sustain weather vagaries.
- Increasing the storage capacities with energy-efficient cold storages.
- Facilitating soft loans to farmers & crop insurance at nominal costs.

- Improving the supply chain through proper monitoring at each stage.

Suggestions

For development of the sector some of the suggestive measures are:

1. Increasing the capacity of cold storages from 42% to 50% in the next three years. This can be achieved by installing 8 new cold storages with an average capacity of 140,500 MT. The distribution of cold storages in the districts are as

   - 2 nos of cold storage in Hooghly
   - 2 nos of cold storage in Paschim Medinipur
   - 2 nos of cold storage in Burdwan
   - 1 no cold storage in Bankura
   - 1 no cold storage in Jalpaiguri.

   Alternately, the government can consider giving financial help to existing, inefficient cold storages. This can be in the form of a "TUFT" kind of scheme for the Textile industry or the one given to auto owners for replacing their engines to be able to run on CNG.

2. Increasing the percentage of processable quantity from 2% to 10% in the next 5 years. To achieve this, an estimated 29,950 ha of land has to devoted fully for producing processable variety of potato. The distribution of land are in the top five potato producing states is given below:

   - In Hooghly, out of the land presently used for potato cultivation 9969 ha has to be devoted to cultivation of processable variety of potato.
   - In Paschim Medinipur, out of the land presently used for potato cultivation 6844 ha has to be devoted to cultivation of processable variety of potato.
   - In Burdwan, out of the land presently used for potato cultivation 6024 ha has to be devoted to cultivation of processable variety of potato.
   - In Bankura, out of the land presently used for potato cultivation 3583 ha has to be devoted to cultivation of processable variety of potato.
   - In Jalpaiguri, out of the land presently used for potato cultivation 3530 ha has to be devoted to cultivation of processable variety of potato.

3. The major players are willing to tie up with the farmers in order to get the variety of potato required for their unit. This is a good sign for the potato cultivators as they will get their price for the produce and the companies in return will get their desired quality.

Sector wise analysis

Rice

West Bengal produced 14340 thousand tones of rice during 2009-10. It is widely grown in the district of Burdwan, West Medinapur, East Medinapur and Bankura.

Suggestions

- A Rice Bio Park should be set up in the district of Burdwan to utilize the rice and all its by-products including generation of power from rice husk. This power in turn can be used for running a rice mill waste within the park premises. DPR on the subject is already been prepared by the state government and it needs implementation

- In case of innovative products from rice, cultivation of Idle rice can be promote in the state.

- Tulaipanji rice, which mainly grows in the district of North Dinajpur can be marketed properly in the domestic markets, specially among Bengali communities. Like Deradhun rice, it can also be exported to other countries. Hence promotion of cultivation of Tulaipanji rice can help in this regard. Moreover patent right is need to be obtained for export purpose.

- Similarly Radhuni Pagal has huge market potentiality. This variety of rice is produce in South Dinajpur and Coochbehar districts of the state. Hence promotion of cultivation of this variety is needed. Moreover patent right is need to be obtained for export purpose.

Sector wise analysis

HONEY

The largest species cultivated in West Bengal for Honey rearing is Apis mellifera. Both the natural and cultivated vegetation constitute an immense potential for development of beekeeping.

Total production and demand in the state

West Bengal has a total honey production of approx 20,000 Tons. Out of this around 20% of the production is used in the domestic markets and the rest 80% are exported from the state. The major countries to where exports take place are Germany, United States, Saudi Arabia, Belgium, United Kingdom, Morocco, Canada and United Arab Emirates etc.

Beekeeping with Apis mellifera has become very popular in West Bengal, producing about 1000 tonnes of honey from this single species. Many other species are also reared in West Bengal. From the Malda district approx 100 crore worth honey is sold annually.

Major production areas in the state

West Bengal is one of the five major honey producing states. The other 4 states being, Punjab, Haryana, Uttar Pradesh & Bihar. The major production areas identified in the State of West Bengal are as follows:

- North 24 Parganas
- South 24 Parganas
- Nadia
- Murshidabad
- Uttar Dinajpur
- Midnapore East
- Bankura

Around 20,000 kg of honey is collected every year from forests of Sundarbans. Mostly people from the Kultali, Joynagar, Basanti, Gosaba and Canning are honey collectors.

Seasonal variation in production of Honey

Depending on the source of honey i.e the type of floral source or fruit trees etc the collection season varies. Besides the month of May, August, September and October, almost all the rest months have collection periods for the various types of Honey.

The peak season for the sales volume are from October to June and Sales Volume are low during months of July to Spetember.

Markets in West Bengal

Domestic market is not very large for Honey. Only a small quantum of the entire produce is consumed at the domestic level. Majorly the produce enters export supply chain.

Names of Companies in Honey and Honey Processing

- West Bengal Bee Keepers Association is one of the major supplier and manufacturer of Honey (raw, packing honey-bengal honey brand), bees, wax, pollen, beekeeping equipnents service provider of honey bottling.
- West Bengal Forest Development Corporation Ltd: Mostly deal in Mouban Honey collected from the Sunderbans
- Bee Keeping Society: Manufacturer of Honey
- Organic Agro India: Exporter of honey
- TFI India: Exporters/ Wholesale Suppliers
- AK Nurture: Manufacturer
- M/s Arindam Saha: Exporters of Honey

Source: exportersindia.com

Types of Processed Forms

- **Crystallized honey** is honey in which some of the glucose content has spontaneously crystallized from solution as the monohydrate also called "granulated honey." .it can be liquefy if stirred in a container of warm water at 120 °F (approx 49 °C).
- **Pasteurized honey** is honey that has been heated in a pasteurization process to destroys yeast cells
- **Raw honey** is honey as it exists in the beehive or as obtained by extraction
- **Strained honey** is honey that has been passed through a mesh material to remove particulate material
- **Ultra filtered honey** is honey processed by very fine filtration under highpressure to remove all extraneous solids and pollen grains
- **Ultra sonicated honey** is honey that has been processed by ultra sonication
- **Whipped honey** also called creamed honey, spun honey, churned honey, candied honey, and honey fondant, is honey that has been processed to control crystallization.
- **Dried honey** has the moisture extracted from liquid honey to create a completely solid, non sticky honey
- **Comb honey** is honey still in the honeybees' wax comb
- **Chunk honey** is honey packed in wide mouth containers consisting of one or more pieces of comb honey immersed in extracted liquid honey

Types of honey varieties available in West Bengal

Honey bees are raised upon a variety of Flowering plants and fruit trees. The Honey type varies according to this rearing brought about by the Bee keepers. Accordingly there are the following varieties of Honey Produced in West Bengal.

Sl.No.	Types of Honey	Months for Collection of Honey
1.	Eucalyptus Honey	November to January.
2.	Lychee Honey	March to April.
3.	Mustard Honey	December to February
4.	Sunderban Honey	June to July
5.	Coriander Honey	February to March
6.	Til Honey	June to July

7.	Kala Zeera Honey	February to March

Source: West Bengal Bee-keepers association

Marketing of Honey

Much of the forest honey is sold to the pharmaceutical, confectionery and food industries, where it is processed and used in different formulations. Apiary honey is usually processed at the producers level. This consists mainly of heating the honey and filtering. A few beekeepers or honey producers co-operative societies have better processing facilities that involve killing of honey fermenting yeasts. About 50per cent of the apiary honey under the KVI sector is graded and marketed under AGMARK specifications. Forest honey is used in pharmaceutical, food, bakery, cosmetic industries and confectionery

The establishment of Khadi and Village Industries Commission has revitalized the traditional village industries, hastened the development of beekeeping. Various incentive packages are being introduced by the Commission which will provide assistance to the Beekeepers.

Bees Keepers grow bees in specifically designed bee boxes. These bee boxes cost around Rs 1100/- as the capital investment. They then rear the bees and the honey collected is usually sold to Collectors who in turn sell these to Exporters or Processors.

Some of the **Processing units for honey** are as follows:

- Processing centre by Ram Krishna Mission, Narendrapur
- West Bengal Honey Association,
- South 24 Pgs Honey Association

They have their own Processing units and machineries.

Major Exporters are:

- Dabur: They collect honey from West Bengal market and then send it for processing to their plant in Himachal Pradesh. Dabur operates in the domestic markets and exports markets through proper retail channels.
- Kashmir Apiary,
- Kejari Wall,
- MB Exim

Various Processed Forms of Honey in West Bengal.

1. Honeybees provide honey and other hive products like royal jelly, bee venom, bee pollen and propolis, which are of great economic value.
2. Honey is also a sweet base for a number of medicines and bee venom is used in many pharmaceutical applications, especially to cure rheumatic diseases. It is a natural dehydrant and excellent for those on slimming diets.
3. The bee pollen is considered as vegetarian protein diet and is taken orally either in the form of tablets or capsules. It is also used in cosmetic industry for manufacturing a wide range of products.
4. The propolis, a black jelly like substance obtained from the beehive, is considered as a natural healing agent. It is also used for manufacturing varnishes.

5. The Royal Jelly is used as food supplement and in tonics. It is also used in manufacture of anti-wrinkle cream and other cosmetic products.
6. The bees wax is used in the cosmetic, pharmaceutical, paint and candle industries. It is also used a waterproofing agent.
7. Bee Venom finds usage in medicines. Bee venom is given as a shot for rheumatoid arthritis, nerve pain (neuralgia), multiple sclerosis (MS), reducing the reaction to bee stings in people who are allergic (desensitization) to them (venom immunotherapy), swollen tendons (tendonitis), and muscle conditions such as fibromyositis and enthesitis.

Suggestive measures

Honey and its processed forms find wide usage and a huge market. If the quality specifications can be maintained and proper hygienic methods be used then the market can be easily tapped. The knowledge on additional income generation from beekeeping, especially on aspects like pollen marketing etc. may also add a new dimension to beekeeping and honey industry.

Problems faced:

- The honey collected from many producers is often of poor quality and fails to meet the national and international standards. Most of the beekeepers are unaware of these standards. Therefore, it is necessary to educate the beekeepers with better apiary.
- Quality testing facilities are also not easily available to beekeepers and packers in India.
- There is no arrangement for disease surveillance. Honey is often stored in undesirable and inappropriate containers which deteriorate the quality
- Indiscriminate use of insecticides, pesticides, weed kllers etc
- Poor quality control for production of honey.
- One more problem is most of the bee keeper have to take loans with high interest rate from mediators which reduces their profit margin away.

Mitigation Measures

- Proper Marketing measures.
- Proper honey sustaining and processing techniques to improve quality of the products for national and international markets.
- Awareness and Training programs for the Bee Keepers for proper disease surveliance, standards to be followed and proper packaging techniques.
- Institutional support for beekeeping in terms of bank loans, etc;

Skill gap in the sector

There are around 13550 registered food processing units in micro and small scale sector which in turn generate direct employment for around 1.00 lakh. Out of 13550 units, 6667 units have been found registered during 2007-2012. These newly registered units have generated employment opportunity for 54460 number of people.

Trend in employment

Sector wise distribution of 54460 people is as follows:

Sector	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
	Male	Fem	Male	Fem	Male	Fem	Male	Fem	Male	Fem	Male	Fem
Cereals & Pulses Processing	1546	21	1428	8	822	105	1157	23	894	40	5847	197
Confectionery/Biscuit	740	19	846	10	172	8	442	1	333	4	2533	42
Diary & Milk	220	5	114	4	174	45	140	1	178	31	826	86
Fish Processing	599	91	1224	104	464	81	545	57	673	30	3505	363
Fruits & vegetable processing	763	28	349	25	408	59	320	45	326	43	2166	200
Edible Oil	806	24	396	10	487	5	346	37	464	21	2499	97
Others	447	37	667	27	435	50	289	30	696	108	2534	252
Packaged Drinking Water	49	0	43	0	83	0	113	0	152	8	440	8
Paddy Processing	3205	196	1673	79	1228	277	2550	40	3800	243	12456	835
Poultry, Meat Processing	226	49	356	51	411	258	482	24	358	26	1833	408
Snacks/Pasta	1365	69	571	25	617	344	404	224	612	419	3569	1081
Soft Drinks	2154	149	1569	105	1998	981	2662	146	2044	207	10427	1588
Spices	180	11	157	10	81	15	81	0	118	14	617	50
Total	12300	699	9393	458	7380	2228	9531	628	10648	1194	49252	5207

Source: DIC and I-Win data

Major activities

In typical unit under micro & small scale it is found that on an average 50% of manpower requirement is supplied from unskilled pool, 30% from semi skilled workers and the balance 20% from specialized skilled pools. Broad activities can be categorized in the following heads

- Raw materials unloading & storage
- Mixing of raw materials and make it ready for processing machine
- Machine operators
- Helper to main machine operator
- Drying/ bottling/ packaging (if necessary) of semi finished/ finished goods
- Storing/ loading of finished goods
- Marketing
- Accountings

Unskilled workers contribute in the areas of:

- Loading / unloading of goods
- Drying/ bottling/ packaging
- Storing
- Marketing

Semi skilled workers are required in the fields of:

- Operation assistance of machine
- Preparation of mixture before it is processed

Skilled workers are required in the field of:

- Operating machines
- Laboratory in charge
- Accounts

Skilled vs unskilled labour

In case of micro and small scale units, industry yet to recognize the role of specialized skilled persons. Generally machine suppliers impart free training to two/ three persons during the installation of machines who works as a master/ skilled workers in the unit.
To meet the excess manpower requirement the units hire fresh low educated persons. Some of them become skilled workers under guidance of their seniors over the period.

Advantage of this process:

- Lower wage bill
- Low attrition rate

Disadvantage of this process:

- Business remains limited within a certain geographical area.
- No changes in items and quality for long period.
- Ultimately stagnation in business

With more customers' awareness these types of units are facing stiff completion from the medium and large units.

Skilled gaps

In the present scenario role of skilled workers in the micro and small units is limited in the area of machine operations. However new items development and quality maintenance can be major focused area for skilled manpower. Hence with the introduction of Food Safety and Standard norms demand for skilled workers in the micro & small units will be increased by leaps & bounds.

In the medium and large scale industry demand for specialized skilled workers (like food technologist) is very prominent.

Present infrastructure

Presently courses on food processing sector are offered by the following institutions of the state:

Name of Institution	Courses	Intake Capacity
Jadavpur University, Kolkata	Food Technology	20
Guru Nanak Institute of Technology, Panihati, Sodpur	Food Technology	60
Haldia Institute of Technology, Haldia, East Medinipur	Food Technology	60
Bidhan Chandra Krishi Vishwavidyalaya	Food Technology	10
Techno India, Salt Lake	Food Technology	60
West Bengal University of Animal & Fisheries Science, Belgachia, Dumdum	Dairy Technology	30
	Fisheries Technology	20
Raninagar Polytechnic, Murshidabad	Fish processing Technology	30
Indian Institutes of Packaging, Kolkata	Packaging Technology	-

Source: I-Win data

Measures to bridge the gap

With growth of the industry requirement of skilled man power is going up. Following measure can be taken to bridge the gaps:

- Introduction of Diploma/ certificate courses in food technology in different Polytechnics/ it is of the state. This courses may help micro and small units to afford more technical persons
- Introduction of part time courses in ITI s to attract interested workers who aspire to up in the industry.
- Workshops, Seminars needs to be organized to generate awareness about the benefit of specialized skilled workers in the context of Food Safety and Standard Act.