

Status of Fisheries Development in West Bengal

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The State of West Bengal, having a coastline of 158 km, (including the Hoogly Matlah estuary), is endowed with a wide range of fishery resources from the Bay of Bengal right upto the Himalayan Foothills. (Table 1). With an estimated fisher population of 14.87 lakhs (2001- '02), comprising both marine (1.99 lakhs) and inland (12.88 lakhs), the State has been in position in fish production (inland) among all Indian States.

Table 1 : Inland Fishery resources of West Bengal ha.

a) Freshwater	
Tanks/ponds	2,76,201.90
Beel/boar	41,781.65
River	1,72,586.36
Reservoir	16,738.8
Canal/creek	80,085.71
b) Brackishwater (ha.) 2,10,000	
c) Marine	
Depth in mts	Area (sq. km)
0-20	13,380
20-50	2,690
50-100	3,040
100-200	8,210
200-300	4,000

During the last few years, this State has made considerable progress in the field of fish seed production and fish culture. With the sustained efforts of the State Government and active participation of fish farmers/fishermen at the grass root level it has been possible to increase fish production in the State from 3.55 lakh (1983 - 84) to 11 lakh (2001 - '02), with an average annual growth rate of 7.3%. It is expected that by way of implementation of schemes for increasing production of fish per unit water area and development of new farms in freshwater sector, and adoption of modern technology in shrimp culture in brackishwater farms and mechanization of a large number of crafts to harvest more fish round the year from the coastal areas, the State would succeed in bridging the gap between demand and supply of fish in the State by the end of the tenth plan period. The advancement of the State in fisheries sector can be gauged by its receiving the national productivity award for the last nine years as well as for the different welfare measures for the uplift of fishing community, who are the prime contributors to production. Realizing the importance of fisheries in the economy of the State, the government of West

Bengal has created an independent department designated as Department of Fisheries, Aquaculture, Aquatic Resource and Fishing Harbours. The Minister of Fisheries, is in charge of this department. The department implements the policies and schemes of the government through the directorate of fisheries, which works under the administrative control of the department. The Directorate is headed by the Director of fisheries who is assisted in his work by an Additional Director, two Joint Directors, 12 Deputy Directors, 41 Assistant Directors and 112 District Fishery Officers. The Directorate has also got 562 Assistant Fishery Officers/Fishery Officers.

The State is divided into 18 fishery districts and 341 fishery blocks (2001 - '02). The entire administrative set up in the district level works in close cooperation with the Panchayati raj institutions headed by the Sabhadhipati of the Zilla parishad.

The department of fisheries has established two Corporations under it. One of them is the State Fisheries Development Corporation Limited (SFDC), established on 31.3.1996. Its activities include looking after culture aspects and marketing of

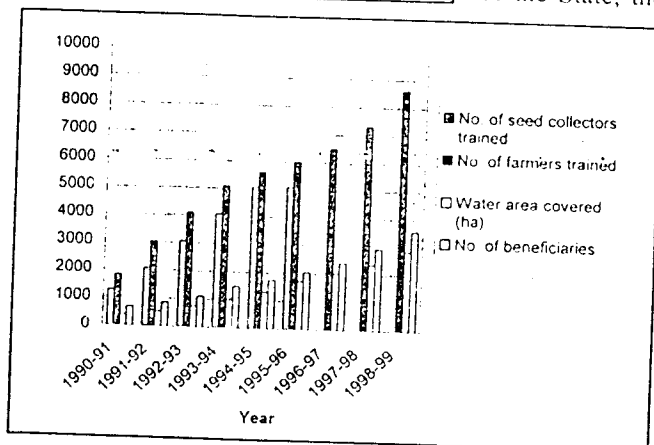


Fig 1 : Achievement under BFDA

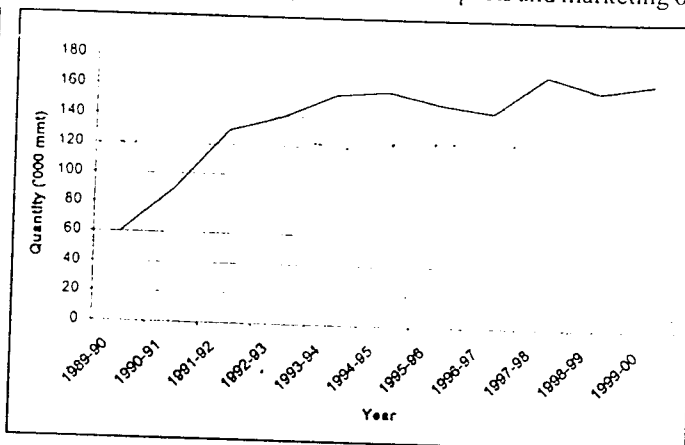


Fig 2 : Marine Fish Production



fish and by products. Under this project, there are 14 farms with 561.33 ha. Waterspread area (226 ha. sewage fed fisheries projects at Nalban and Goltala near Kolkata, 160 ha of brackishwater fish farming projects at Alampur, Digha and Frasergunj, 73.33 ha. freshwater fisheries projects at Narghat, Haldia, Katnadighi, Rankinidaha, Durgapur, Krsihnabundh and Gatatbundh and 102 ha. reservoir fisheries project at Hinglow). The statistics of last ten years show that a production of 1134.61 mmt had yielded revenue amounting to Rs. 310.26 lakhs upto 1998 - 99. The other Corporation, named as West Bengal Fisheries Corporation Ltd. (WBFC), was established in 1980 by the Government of West Bengal with the objective of meeting the demand of fish seed in the domestic market of the State. Afterwards its mandate was modified to include development of infrastructural facilities too in the sector. The WBFC has constructed fishing harbours at Shankarpur and Frasergunj, brackishwater fish farm at Shankarpur, shrimp and fish culture project at Digha and Dadanpatrabar of Midnapore district and at Canning and Dighirpar of South 24 Parganas district, ice plants with 20 mmt/day and 10 mmt/day capacity at Shankarpur and Frasergunj, set up fish processing units, fish landing cum berthing jetties, bridges, and acquired insulated transport vehicles for marketing of fish.

The Government of West Bengal has a unique policy due to which majority of the water bodies throughout the State are leased to local fishermen's cooperatives under the apex body of fishermen's cooperatives in the State, the West Bengal State Fishermen Cooperative Federation Ltd. (BENFISH). Though this was set up in 1978 as the apex body of all the fishermen's cooperatives of this State, this has become a self supported organisation with various activities within and outside the State with a pledge for the socio economic upliftment of the backward fishermen community of the State. It has a membership of 154 with paid up share capital of Rs. 25 crores. This State level fishermen's cooperative is managed by a Board of Directors headed by the honourable minister-in-charge of fisheries as the chairperson. By dint of efficient management, the organization now provides employment to approximately 20,000 fishermen as harvesters and 15,000 fishermen as commission agents for marketing of the catches and other fish products. About 150 regular and 20 contract service staff serve in the offices of BENFISH. Some of the major activities of BENFISH include the implementation of the West Bengal Integrated Fisheries Development project under financial assistance provided by the N.C.D.C., the beel fisheries development project for 87 beels in seven districts, brackishwater development project

in Midnapore district, marketing of raw and processed fish through its mobile vans and retail marketing outlets in major towns and cities of the State as well as in New Delhi, promotion of tourism in the State and neighbouring States by generation of revenue from its tourist lodges and guest houses (Meen Bhavans), ensuring welfare schemes for fishermen like Fishermen's Group Personal Accident Insurance Scheme for active fishermen, centrally sponsored Saving cum Relief Scheme for the marine fishermen, training scheme of BENFISH for fishermen, under different N.C.D.C. assisted projects.

The multifaceted activities undertaken by the department of fisheries, West Bengal for increasing fish production up to the fullest potential in the State has made West Bengal the highest inland fish producer and the number one major carp fish seed producer in the country.

Fish Production

West Bengal occupies the top position in fish production in the country. It also has the highest domestic demand for fish and fishery products in the country, thus contributing 3.53% to the GDP, (2001 - '02). The production of fish, both inland and marine for the last ten years is given in Table 2.

Highlights of fishery development in the State

Fish seed production : West Bengal is the pioneer in the production of fish seed. It produces 9000 million nos of seeds annually (2001-'02) and contributes to about 75% of the total seed production in the country. This has been possible because of the setting up of about 350 low cost portable Chinese and glass jar hatcheries, mainly for hatching of eggs of Indian Major Carps (IMC) in rural and semi-urban areas of the State. It has not only lessened dependence on natural riverine fish seed but has also enabled the State to meet about 45% of the fish seed demand of other States.

Table 2 : Fish production : unit' 000 t (1990 -2000)

Year	Quantity	Inland	Marine
1990-91	680	555	125
1991-92	732	592	140
1992-93	757	612	145
1993-94	806	653	153
1994-95	820	669	151
1995-96	893	740	153
1996-97	937	765	172
1997-98	950.20	786.20	164
1998-99	995	823.50	171.50
1999-00	1045.70	865.70	180
2001-02	1100.00	N.A.	N.A.

Table 3 : Fish seed production (million nos)

Year	Quantity	Year	Quantity
1980-81	2300	1990-91	7552
1981-82	3200	1991-92	7884
1982-83	3150	1992-93	7980
1983-84	3910	1993-94	8105
1984-85	4200	1994-95	8126
1985-86	5000	1995-96	8180
1986-87	6100	1996-97	8435
1987-88	7005	1997-98	8500
1988-89	7200	1998-99	8610
1989-90	7400	1999-00	8725
2001-02	9000		

Freshwater fisheries development

In order to utilize the vast potential resources for production of table fish, Fish Farmers Development Agencies (FFDAs) have been functioning in 18 fishery districts in the State, involving

3,64,740 beneficiaries of which 12,124 are women. Besides giving technical guidance to the fish farmers, these agencies also help them to get govt. subsidy and institutional finance for fishery activities. These FFDAs have been able to raise

units each unit comprising 140 square metre of water area, have been supported by various programmes. *Jhora* fishery of West Bengal is one of the unique features of coldwater fishery development in the country. Development details of *jhora* fisheries are presented in Table 4.

Table 4 : Development of pond fishery under inland fisheries project through FFDAs in West Bengal

Year	Water area covered in ha. (Cumulative)	Unit of <i>jhora</i>	Number of beneficiaries
1990-91	79,667.38	1,364.5	2,55,043
1991-92	85,328.78	1,735.5	2,75,952
1992-93	89,475.86	1,873.5	2,89,184
1993-94	92,670.43	2071	3,02,088
1994-95	95,712.00	2259	3,12,709
1995-96	98,837.39	2423	3,22,427
1996-97	1,01,837.20	2576	3,35,122
1997-98	1,03,825.96	2691	3,42,499
1998-99	1,05,961.32	2841	3,48,606
1999-00	1,07,814.28	2,983.5	3,54,695
2001-02	1,12,000.00	3273	3,64,740

productivity from 600 kg/ha/annum in 1980 - 81 to 3500 kg/ha/annum in 2001 - '02. So far, 1.12 lakh ha of water area in the State has been brought under fish culture by scientific methods through FFDA assisted programmes.

In the hilly areas of Darjeeling the FFDA has taken up fish culture by impounding running water from hill streams (*jhoras*). Till date, 3273.5 *jhora*

Ornamental fish culture has been in practice in some districts of the State. This sector needs reorganization and support from adequate training and availability of funds. Ornamental fish breeding and culture has been inducted under FFDA from the year 2000 in certain centres in the districts of Howrah and 24 Parganas, and a few other centres. Modern hatcheries for breeding these fishes have been set up recently in Howrah district. Rearing of some local indigenous fishes which are considered trash fishes but have export potential, are being encouraged by a private hatchery set up in Jalpaiguri district under FFDA programme. Nearly 68 ornamental fish units are in operation presently all over the State.

Table 5 : District Wise Production of fish during 2001-2002 (In mt)

District	Inland		Marine	
	Fish	Prawn	Fish	Prawn
1. Coochbehar	15,134.57			
2. Jalpaiguri	7,992.61			
3. Siliguri	2,299.45			
4. Uttar Dinajpur	26,303.43			
5. Dakshin Dinajpur	19,853.38			
6. Malda	31,309.03			
7. Murshidabad	55,169.86			
8. Nadia	52,557.91			
9. 24-Parganas (N)	78,170.38	10,238.35		
10. 24-Parganas (S)	105,693.69	5,701.25	69,554.96	7,035.00
11. Kolkata	21,819.00			
12. Howrah	19,137.45			
13. Hooghly	57,757.90			
14. Medinipur	132,681.18	6,845.40	97,000.04	10,710.00
15. Bankura	49,774.16			
16. Purulia	78,511.64			
17. Burdwan	88,691.65			
18. Birbhum	50,197.26			
Total	893,024.55	22,785.00	1,66,555.00	17,745.00

Sewage fed fisheries : Sewage fed fisheries provide a unique system of recycling urban waste for productive use. Peri urban area of Kolkata is a modified zone where the city and suburban village blends. It is unique in the sense that, the biodegradable human, animal and other domestic wastes of Kolkata are brought into this area through canals that enter its various pockets. In this zone, where a large number of beels, swamps and brackishwater lakes (locally known as *bherys*) exist, the city sewage undergoes bio recycling through production of profitable fish protein. The peri urban area, with an extent of 4000 hectares is an enchanting conglomeration of sewage fed fisheries, aquarium fish culture, brackishwater fish culture, floriculture and vegetable production. The city's waste-based resource system has also been considered as the best possible ecologically balanced land use pattern in urban areas of the world. There are about 245 fishery units under this system with a total waterspread area of 7,262.11 acres under culture. Indian major carps, common

Table 6 : Shrimp Production in West Bengal (In mt)

Year	Inland		Marine		Total
	Penaeid	Non-penaeid	Penaeid	Non-penaeid	
1990-91	12,370	6,220	7,350	2,845	28,785
1991-92	13,819	7,029	8,116	3,471	32,435
1992-93	14,608	7,850	8,497	3,450	34,405
1993-94	15,025	7,751	9,383	3,159	35,318
1994-95	14,893	8,122	8,657	4,128	35,800
1995-96	16,632	7,392	8,718	3,758	36,500
1996-97	16,261	8,958	9,039	4,242	38,500
1997-98	17,373	8,161	10,727	3,239	39,500
1998-99	18,357	6,442	11,319	3,947	40,065
1999-2000	17,049	6,178	11,599	5,924	40,750
2000-2001	16,610	6,075	11,320	6,015	40,020
2001-2002	18,200	4,250	11,615	6,130	40,195

carp and tilapia were dominant, but lately, Pangus and freshwater prawn have also been added, giving an average productivity of 5.16 mt/ha.

Social fishery and river ranching : 'Social Fishery' scheme was introduced in 1987-88 under which, water bodies owned by the government departments, institutions etc. are stocked and management is transferred to a group selected by local panchayats, from among those living below the poverty line. Upto 2001, about 10,400 ha. of area has been developed through implementation of this scheme. Decline of riverine catch prompted the State Department of Fisheries in 1992-93 to ranch some selected

Group-wise Fish Landings in West Bengal (2001-02)

(in mt)

Species item	Marine	Inland		Total
		Capture	Culture	
1. Major Carps		6,743.00	5,45,715.00	5,52,188.00
2. Minor Carps		9,12.00	19,061.00	19,973.00
3. Exotic Carps (Common, Silver & Grass carps)			1,37,007.00	1,37,007.00
4. Murrels (<i>Ophiocephalus</i> spp.)		29,278.00		29,278.00
5. Catfishes (<i>Wallago attu</i> , <i>Rita rita</i> , etc.)		32,112.00		32,112.00
6. Other fresh water fishes lesser known		65,128.00	37,488.00	1,02,616.00
7. Indian shad (<i>Hilsa ilisha</i>)	33,102.00	44,810.00		44,810.00
8. Bombay duck (<i>Harpodon nehereus</i>)	34,001.20			
9. Sea catfishes	33,010.30			
10. Eels (<i>Muraenosox talabonoides</i>)	370.02			
11. Silver bellies (<i>Leiognathus</i> spp.)	369.80			
12. Sciaenids (Croakers)	14,010.00			
13. Goat fishes (<i>Upeneus</i> spp.)	1,100.00			
14. Half beaks (<i>Lutjanus</i> spp.)	370.00			
15. Mulletts (<i>Mugil</i> spp.)	1,500.90			
16. Butter fishes (Stromatidae)	9,004.10			
17. Indian oil sardine (<i>Sardinella</i> spp.)	5,600.20			
18. Anchovies and other clupeids	11,000.20			
19. Seerfishes (<i>Scomberomorus</i> spp.)	1,780.00			
20. Hairtails or cutlass fishes (<i>Trichiuridae</i>)	7,400.00			
21. Indian mackerel (<i>Rastreliger kanagurta</i>)	4,080.00			
22. Elasmobranchs (Sharks, rays and skates)	4,300.20			
23. Penaeid shrimps	11,700.00		1,18,125.00	1,18,125.00
24. Non penaeid prawns	6,000.00	6,080.30		6,080.30
25. Crabs	100.10			
26. Other Natantian decapods	1,709.90			
27. Molluscs	3,560.70			
Total	1,84,091.39	1,57,793.30	7,57,396.40	9,15,189.70

stretches of rivers flowing through the districts of Murshidabad, Burdwan, Nadia and Hooghly. This programme is in operation ever since and nearly 20,00,000 fingerlings of IMC fingerlings are stocked every year in the Ganges and its tributaries. Results obtained are encouraging.

Brackishwater fishery development: West Bengal has the largest impounded brackishwater area (2,10,000 ha.) in the country. Considering the enormous prospect for development of brackishwater fish farming, three BFDA's have been set up in the coastal districts of Midnapore, South 24 Parganas. Upto 2001 - '02, 460.45 ha of area have been developed under BFDA scheme. The farmers have adopted improved traditional culture according to the guidelines of Aquaculture Authority of India so that no environmental hazards may crop up. Polyculture is most widely practised by the brackishwater fish farmers.

The culture of *Macrobrachium rosenbergii* (giant freshwater prawn) has become a new source of earning to the farmers. Instead of depending too much on natural shrimp seed collection, 14 giant freshwater prawn hatcheries have been set up in the state and 4 *Penaeus monodon* hatcheries are being set up in the coastal areas, creating opportunities of increase in employment by 25%. A new island, located near Haldia port, named "Meendweep" has been found to offer immense opportunity for shrimp culture. About 250 ha. of this island is being developed for shrimp farming in the cooperative sector with financial support of N.C.D.C. Along with shrimp, mud crab culture, started in 1998-99, presently covers about 3 ha. area under BFDA schemes in the State.

World Bank-aided Shrimp Culture project : About 480 ha of brackishwater area at four sites, namely Canning and Dighirpar in south 24

Parganas, Digha and Dadanpatrabar in Midnapore district have been developed under the World Bank aided fish and shrimp culture project, with fair amount of success.

Marine fisheries

The marine fishing zone of West Bengal has rich potential of commercially important variety of marine fishes and shrimps due to influx of nutrient laden water in the Bay of Bengal through creeks and canals of the Sundarbans. Earlier, the major portion of marine catch was being landed by traditional craft through artisanal fishing gears placing a obvious limitation on the quantity of the catch. Due to growing demand for fish and with people gradually developing a taste for marine fish, it was felt necessary to improve fishing techniques which called for mechanization of the fishing vessels and modernization of the fishing gears. NABARD and N.C.D.C. had helped in the motorisation of traditional crafts under their various refinance schemes.

District wise No. of Societies, Participants in production and employment generated as on 31 Mar, 2002

Name of the District	Total No. of Co-op. Societies			No. of members	No. of members participated in production effort	No. of Employees in Co-op. Societies		
	PFCS	No. of active societies	CFCS			PFCS	CFCS	Total
1. Coochbehar	79	55	1	5,787	3,567	51	18	69
2. Jalpaiguri	9	6	1	569	370	1	5	6
3. Darjeeling	1	1	0	79	51	0	0	0
4. Uttar Dinajpur	12	9	1	853	554	12	10	22
5. Dakshin Dinajpur	17	12	1	1,186	771	11	9	20
6. Malda	57	43	1	3,767	2,449	11	31	42
7. Murshidabad	96	68	1	6,673	4,337	22	48	70
8. Birbhum	29	20	1	2,009	1,309	3	4	7
9. Nadia	88	67	1	6,042	3,927	82	41	123
10. 24-Paraganas (N)	79	61	1	5,395	3,517	196	25	221
11. 24-Paraganas (S)	210	155	2	13,670	8,927	59	16	75
12. Howrah	52	37	1	3,587	2,332	3	4	7
13. Hooghly	59	42	1	4,029	2,618	20	13	33
14. Burdwan	56	40	1	3,823	2,484	4	7	11
15. Purba Medinipur	157	114	2	10,447	6,938	33	15	48
16. Paschim Medinipur	74	52	1	5,106	3,319	7	2	9
17. Bankura	54	38	2	3,763	2,446	2	5	7
18. Purulia	42	29	1	2,910	1,892	4	7	11
Total	1171	849	20	79,395	51,808	521	250	781

Forecast for potential fishing zones: A major step forward towards a better future in marine fishery development is the utilisation of satellite information service for identifying potential fishing zones (PFZ) in the Bay of Bengal with help from the National Remote Sens-

Table 9: Export of Marine Products from West Bengal
(Quantity in MT) (Value in Rs./Crores)

Year	Quantity	Value
1968	38.00	0.0679
1969	138.00	0.2165
1970	149.00	0.2144
1971	507.00	1.0806
1972	1,084.00	2.4424
1973	1,133.00	2.5516
1974	1,165.00	2.9236
1975	1,735.00	5.8206
1976	2,943.00	14.3222
1977	3,084.00	16.4527
1978	2,853.00	16.6785
1979	1,266.00	7.7740
1980	3,029.00	20.1417
1981	3,308.00	32.4943
1982	4,807.00	42.1200
1983	4,638.00	43.2900
1983-84	4,766.00	44.1200
1984-85	4,308.00	34.0300
1985-86	3,538.59	36.7800
1986-87	4,334.78	49.0500
1987-88	4,093.31	48.1700
1988-89	4,851.37	65.7200
1989-90	-	-
1990-91	-	-
1991-92	-	-
1992-93	9,562.00	183.6700
1993-94	121.33	262.2900
1994-95	13,023.00	325.6500
1995-96	13,361.00	330.0600
1996-97	16,111.00	420.4400
1997-98	14,450.00	416.6900
1998-99	15,060.00	457.9100
1999-2000	16,348.00	511.7000
2000-2001	18,420.00	630.9000
2001-2002	16,886.00	497.9200

ing Agency, Hyderabad. The information about location of PFZ from different fishing bases is disseminated to the fishing fleet at sea. About 60-70 such PFZ signals are received annually. Further, arrangements are being made for broadcasting such information in daily special weather reports by All India Radio and Doordarshan, Kolkata, as well as the daily newspapers. The programmes of supply of wireless walkie talkie for use in fishing boat and installation of a wireless communication center at Digha (Shankarpur) and Frasergunj fishing harbours have been taken up and the work is showing good progress.

Construction of Fishing Harbours:

Fishing harbours have been set up in the state, two at Shankarpur near Digha and Frasergunj in the 24 Parganas (S) and one at Sultanpur in Diamond Harbour, with necessary support facilities. The fishing harbours have been performing successfully. The berthing facility at Shankarpur allows more than 500 mechanised boats to operate. Frasergunj fishing harbour in South 24 Parganas has a berthing facility of 200 vessels with necessary shore facilities.

Development of Fish Landing Centers and other Infrastructural Facilities

Keeping in view the increasing pressure for fish landing space, a programme for the creation of this infrastructural facility for landing and berthing has been taken up. Out of the existing 53 estuarine and marine landing centers, 39 seasonal landing centers distributed in South 24 Parganas, Midnapore and North 24 Parganas have been developed, with permanent structures like concrete landing jetty, covered fish washing platform, distress sheds, boat making/repairing sheds, tubewells, training halls and community hall. About 1530 km of village roads have also been constructed.

Provision for Navigational Aid to Fishing Vessels : For facilitating navigation of fishing vessels engaged in Bay of Bengal, 29 guide lights have been in-

stalled at different points in the coastal belt of the State which have been functioning since 1979-80.

Welfare Measures

Training : Training is an essential part of human resource development. The fisheries department of the government of West Bengal, along with the faculty of fishery sciences, West Bengal University of Animal and Fishery Sciences has been instrumental in organizing intensive training programmes at the grass root level on different aspects of fisheries and allied vocations for fishermen, fisherwomen and rural youth. The State has three tier training facilities at the block level, district level and state level. The state level training is conducted with residential facility for eligible fishermen. The district and block level training as well as some trainings at the village level are conducted by the departmental officers in the field. The selection for the state level training is made on the basis of the performance of the trainees in this field level training. District level training centers - cum - administrative buildings have been set up in almost all the districts. Brackishwater training centers have been set up at Nazat (North 24 Parganas) and at Contai (Midnapore). The state fisheries training center at Kulia near Kalyani trains progressive fish farmers, officials of Fisheries Directorate and students of the fisheries colleges during their work experience programme, while marine fisheries training is also imparted at the centers at Namkhana in south 24 Parganas and at Shankarpur/Ramnagore in Midnapore district.

Group/Personal Accident Insurance :

This programme was started by the government in 1984 - 85 as a means of providing economic security to fishermen families against loss of life or permanent disablement arising out of professional hazards. Financial assistance of Rs. 35,000 in case of death and Rs. 17,500 in case of permanent disablement is extended against an annual premium of Rs. 12 only, which is borne by the government. Upto 2001 - '02, 572 families have been benefitted, with total finan-



cial assistance amounting to Rs. 1.36 crores.

Issue of Identity Cards to Fishermen: Issue of identity cards to fishermen is a pioneering step taken by the department in order to ensure profits for deserving fishermen. Upto 2001 - '02, 2.6 lakh identity cards have been issued. More of these cards are to be distributed soon for fisherwomen working as daily wage labourers.

Saving cum Relief Scheme : This scheme, introduced in 1989 - 99, requires fishermen to deposit a token amount per month during the fishing season which helps them during the lean season. It has already benefitted 10,000 fishermen.

Tribal Sub Plan : The government has taken up various schemes for upliftment of scheduled caste and tribe fishermen. Assistance is provided to tribal beneficiaries by providing them with fishing nets, hundies, fish seed etc, and also getting them trained in various aspects of fishculture.

Housing programme : Under the Basic Minimum Services Programme, the first housing scheme, was taken up by the fisheries department in 1985 - 86. Since then, about fifty houses have been constructed. Development of model village for fishermen was undertaken with the help of the National Welfare Fund, under which 12,797 houses have been constructed so far. 13 such model villages with 6188 houses have been developed till 2001 - '02, in the districts of Midnapore, south 24 Parganas, Nadia, Murshidabad, North districts of Midnapore, south 24 Parganas, Nadia, Murshidabad, North Hooghly, Birhum, Bankura and West Dinajpur. Work on six model villages are now in progress and when completed shall benefit 586 families.

Old Age Pension : With a view to helping the old and infirm fishermen/women who do not have any viable means of livelihood, an amount of Rs. 300 per month is being paid as pension from 1997 - 98.

Fisheries Legislation

The legal framework dealing with fisheries in the State have been streamlined and amended from time to time. The Marine Fishing Regulation Act, 1993 and Rules, '95 and West Bengal Inland Fisheries Act, 1984 and Rules, '85 have been framed to deal with the marine and inland fisheries sectors respectively, for ensuring sustainable fisheries in an eco-friendly manner. Under the former, 4 well-equipped patrol boats have been fabricated for enforcement of marine fisheries legislation. About 2,700 traditional and 2,930 mechanised crafts have been registered under Marine Regulation Rules. The department also attaches due importance to collection of non tax revenue for which West Bengal Fish Producers' Licensing Order, 1975 and the West Bengal Fish Dealers Licensing Order, 1975 have been promulgated. During the last three years, non tax revenue in the form of license fee has increased.

In order to protect the water bodies and wetlands in an around Kolkata, municipal towns and urban areas of the State, unauthorized and illegal filling up of water bodies measuring 0.07 ha. and above has been made a non-bailable offence, punishable under the provision of West Bengal Inland Fisheries (Amendment) Act, 1998. Upto 2001 - '02, 165 FIRs have been registered in this regard and 47.5 ha. of water bodies have been saved through Inland Fisheries Act, 1998. The State has also declared the 16th of June as the wetland Day for conservation and protection of the wetlands.

Export Earnings

West Bengal is one of the pioneering States contributing to export of shrimps and certain varieties of fishes to different countries. During the assessment year 2000 - '01, 18,420 metric tonnes (mmt) of fishery products, worth Rs. 585.57 crores were exported, of which 90% comprised shrimps.

Research Activities

Fisheries research activities are given importance in West Bengal. The

State has a Freshwater Research Station situated at Nadia district under the charge of a Deputy Director of fisheries. This institute, established in 1962, is now engaged in need based research activities in areas of fish seed production, propagation and culture of *Clarius batrachus* (magur) and freshwater pearls. Notable success has been achieved in pearl production from cultured freshwater mussels. Rural poor are being trained in this technology with help from Department of Rural Development and the State Department of Science and Technology.

Junput Technological Station at Midnapore district produced about 4 crores of spawn during 1998-99, major portion of which was distributed among cyclone affected fish farmers. The brackishwater section of this farm has successfully reared seed of a number of brackishwater fishes like *Chanos chanos* (milkfish), *Lates calcarifer* (bhetki), *Liza parsia* (parsey) fish which were supplied to World bank aided project and also supplied to fish farmers. The center proposes to take up breeding and culture of pearlspot, set up a brackishwater fish seed bank, and cryopreservation of milt of threatened fishes.

The Microbiological and Parasitological Research Center at Captain Bheri in and around the peri urban areas of Kolkata city has specialization to take up research on prevention and control of fin fish and shell fish diseases. It is a well equipped laboratory which has achieved some pioneering results in controlling the Epizootic Ulcerative Syndrome using herbal remedies like turmeric and neem. Among its other notable achievements are the identification and enlistment of 96 potential fish species which are otherwise treated as trash fish but can fetch a good amount of foreign exchange. It has also been helping fish farmers on soil and water analysis and microbiological investigations of fish and prawn samples. Following the advice of technicians of this center, about 500 fish farmers have been benefitted. Recently, the center has initiated projects on cryopreservation of fertilized eggs, mud crab breeding and culture etc. These achievements have culminated in some ex-



cellent research publications in noted journals.

The state fisheries department has 18 district level and 3 state level laboratories for routine analysis and research. The department with the aid of the World Bank, has taken up a project, to reorient and strengthen the district FFDA and BFDA laboratories along with the establishment of laboratories at the four sites of World Bank aided shrimp and fish culture farms.

Monitoring, Evaluation, Marketing and Statistics

This wing has been entrusted with several important activities viz. market intelligence, extensive survey of existing and potential resources in inland and marine sectors, monitoring and evaluation of different fisheries schemes and management information services. Besides collecting data on wholesale and retail prices of different varieties of fishes and their supply position, this wing prepares production estimates through well-defined statistical sampling system. The M.E. and M.S (monitoring evaluation and market survey) wing of the directorate is now engaged in implementing the Fish Producers/dealers Licensing Order on

fish and fisheries of the state.

Extension Efforts

Various seminars, exhibitions and fairs are organized by the department in coordination with the state universities and research institutes of Kolkata and suburbs. The state department of fisheries conducts demonstration of technologies both in the field and its centers. The findings of research are disseminated among people through publication of a leaflet called "Meenbarta".

Future thrust areas

The primary thrust areas for the future development of fisheries of West Bengal are as follows :

- 1) The completion of the largest shrimp farm at Meendweep (Nayachar) near Haldia port;
- 2) Increase of aqua productivity in a sustainable manner through training and extension up to grass root level;
- 3) Providing coastal wireless communication access to fishermen for protection while at sea;
- 4) Expansion of the diagnostic laboratory at Captain bheri so as to tackle white spot and other such deadly viral diseases;
- 5) Strengthening district laboratories to extend di-

- agnostic facilities to remote villages;
- 6) Reclamation of fallow wetlands to utilise them for sewage fed fish culture;
- 7) Promotion of eco tourism and recreational fishery;
- 8) Strengthening of prohibitory rules related to river fishing between 16 June and 15 September, the period coinciding with the breeding season of several riverine migratory fishes, specially the prized *Hilsa*;
- 9) Adequate regulation of monitoring and surveillance by involving grass root level panchayats in the process;
- 10) Imparting training to seed collectors to segregate commercial and non commercial varieties of seeds at the time of collection it self to conserve biodiversity;
- 11) During irrigation seasons restrictions to be imposed in such a manner that at least one meter of water should be retained in village ponds to facilitate aquaculture. This is to discourage general trend in rural West Bengal to dry up the culture ponds forcefully to provide water for irrigating paddy fields;
- 12) Imposing ban on polyculture with *Clarius gariepinus*. Controlled monoculture or biculture with tilapia to be encouraged instead, so as to utilise derelict and foul water bodies as well as in highly saline backwaters, where culture of other species is not possible.

