

**THE BOTTOM LONGLINE FISHERY  
FOR CROAKER (SCIAENIDAE)**

by

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### 35. INTRODUCTION

The traditional fishing gear in the marine fisheries sector of Bangladesh are the set bagnet, gillnet, beach seine, castnet and traps. Trammelnet, bottom longline, and trawl are relatively new introductions. Among these, the bottom longline for croaker has become one of the important fisheries because the catches are for export. It is believed that this fishery began with the encouragement of some overseas buyers in the mid-1970s, in the Cox's Bazar area, but no records are available.

Croakers are taken by several other fishing gear apart from the longline. For instance, they are taken as by-catch in the *hilsa* gillnets and are also present in both the marine and estuarine set bagnet catches. This preliminary study was undertaken to estimate the production of croakers in the bottom longline fishery, the species and size composition of the catch and to make an assessment of the economics of the fishery.

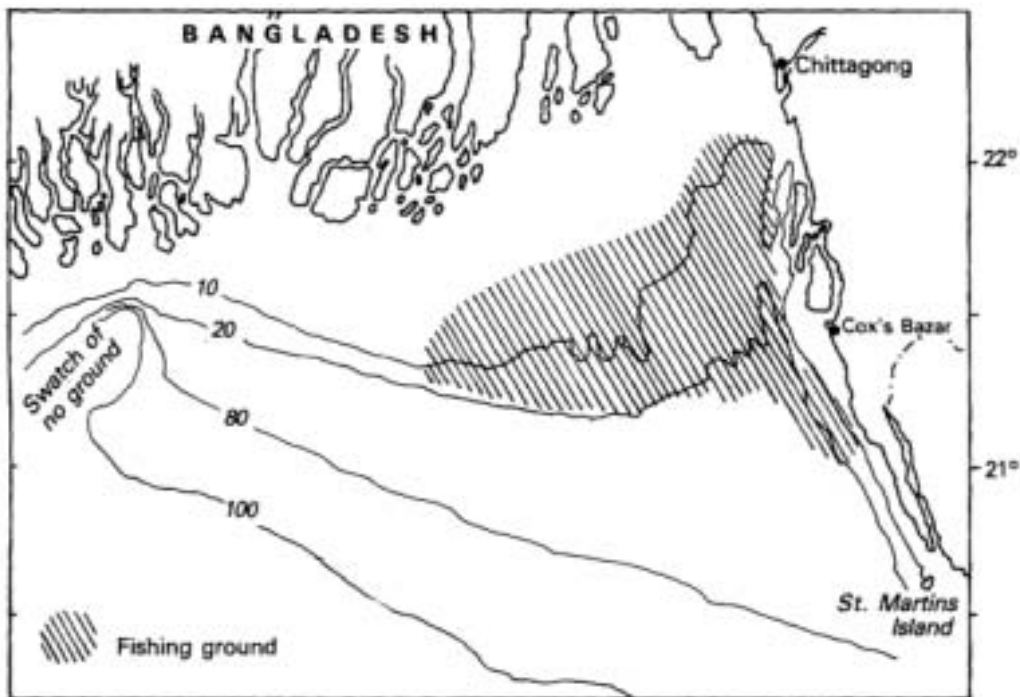
Data were collected during field visits — six days a month in January, February and November 1991. Processing factories in Cox's Bazar were also visited to collect information on processing methods, quantities processed and exported, and their value.

### 36. METHODOLOGY

#### 36.1 Fishing area

Longlining for croaker is conducted in areas south of Chittagong, Noakhali and Patuakhali and southwest of Cox's Bazar, roughly within the 10 and 30 m depth contours. The geographic locations of the fishing grounds are shown in Figure 46.

Fig 46. Fishing ground for croaker bottom longlining

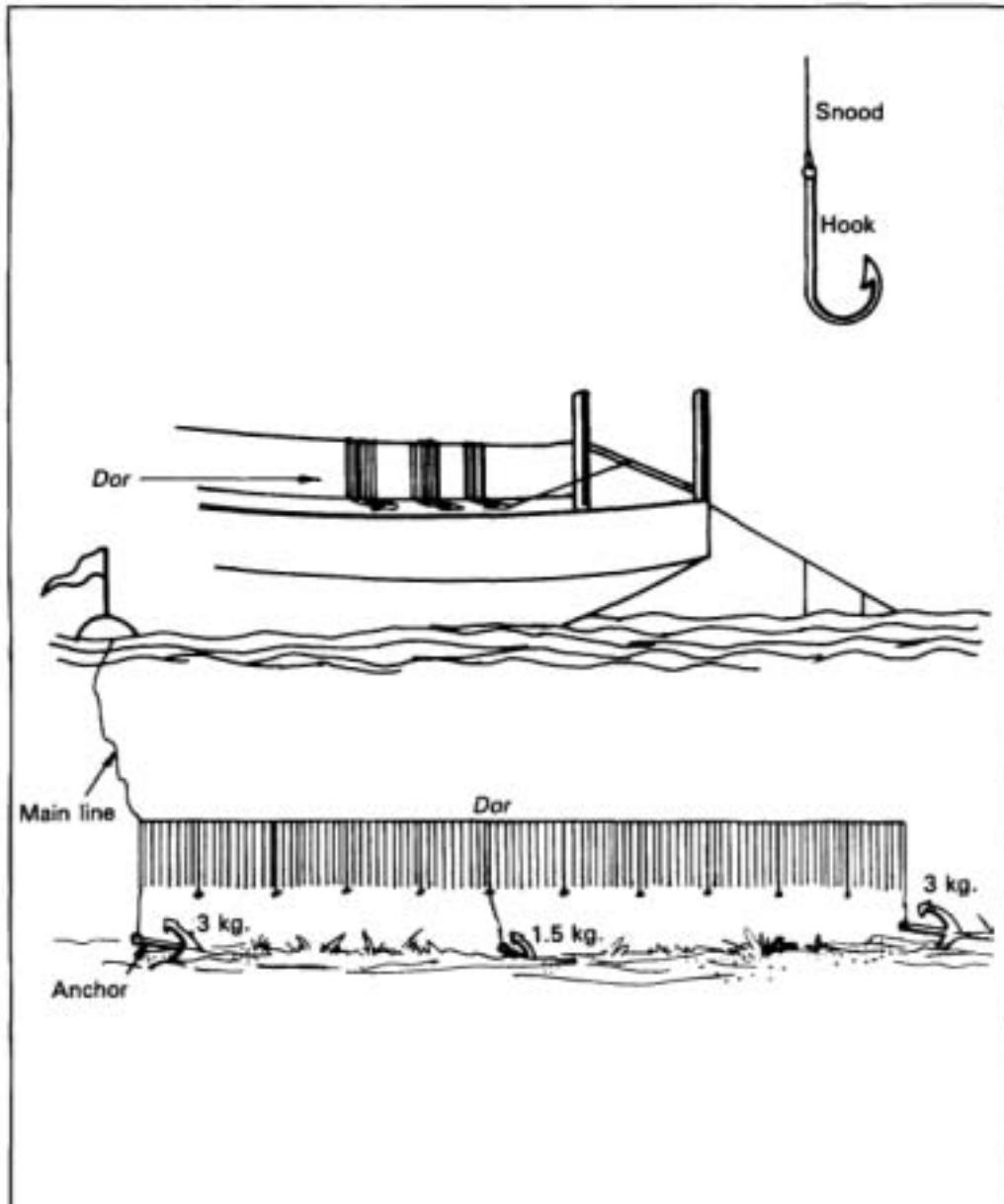


### 36.2 Craft, gear and operation

Motorized craft of 9-12 m length, with 12-36 hp diesel in-board engines are used for longline fishing. The number of fishermen per boat is 8-13.

The average length of the mainline is 3200-4000 m. The distance between two consecutive snoods varies from 1.0 to 1.2 m and the length of the snoods vary from 45 to 55 cm. The size of hook varies from no. 6 to 8. A set of 300 snoods with hooks is called a *dor* (Figure 47).

Fig 47. Design and specifications of a bottom longline



Several such *dors* make up a longline. Each *dor* is weighted down with two 3 kg anchors and a 1.5 kg anchor in between. Between the two 3 kg anchors are also attached 12 iron pieces, each weighing 500 g, to keep the hooks at the bottom. A marker buoy (float) is placed close to the position of each anchor.

The line is shot at the beginning of high tide or ebb tide and it takes approximately 1 1/2 hours to complete the setting of the line. It is hauled in two hours after setting and hauling in takes about two hours. The gear is manually operated and four operations are conducted a day.

The bait used are cuttlefish, anchovy, Bigeye Shad, croaker, Ribbonfish and Queenfish. in cut pieces in the case of the larger fish varieties. The hooks are baited while sailing to the fishing ground and are arranged serially on a plank at the bow of the craft (Figure 47). with the coils of lines placed on the deck. After hauling in, the hooks without bait are rebaited and the lines readied for the next operation. Fishermen use purchased bait for the first fishing operation: for subsequent operations during the trip, they use a portion of the catch as bait.

### 36.3 Fishing season

The croaker fishing season extends from mid-August to mid-February and fishing is done only during the neap tide period. Day trips are made at the beginning of the fishing season, in August and September, and at the end of the season, from mid-January to mid-February. Fishing trips of four days duration are undertaken during the peak months of October-January. The fishing days average 18 days a month during the lean season and four 4-day trips a month during the peak season.

### 36.4 Catch rate and composition

The average catch per boat per day for a day-trip is 99 kg of croaker (besides 76 kg of other fish). On a 4-day trip, during the peak season, however, the catch rate is 108 kg of croaker. The targeted species of croaker (Sciaenidae) are:

Scientific name	Common English name	Local name
<i>Pennahia argentata</i>	Silverpennah Croaker	Lal poa/poka
<i>Johnius belangerii</i>	Belanger's Croaker	Sada poalpoka
<i>Protonibea diacanthus</i>	Spotted Croaker	Kala poa/poka
<i>Otolithoides pamu</i>	Pama Croaker	Lombu

During the survey it was found that different species were dominant in the catches at different times of the season. Silverpennah Croaker were dominant in August-November, Belanger's Croaker in December-February and Spotted Croaker towards the end of the season.

Figures 48 a-b show that the size range of Silverpennah Croaker and Belanger's Croaker were predominantly between 30cm and 45cm, with the mode around 36cm. Interviews with fishermen and factory managers revealed that croaker less than 13 cm were not caught in the longlines operated.

Fig 48a. Size group of Silverpennah Croaker (*P. argentata*)

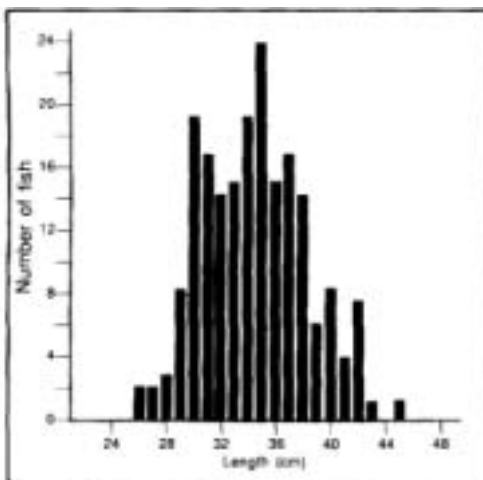
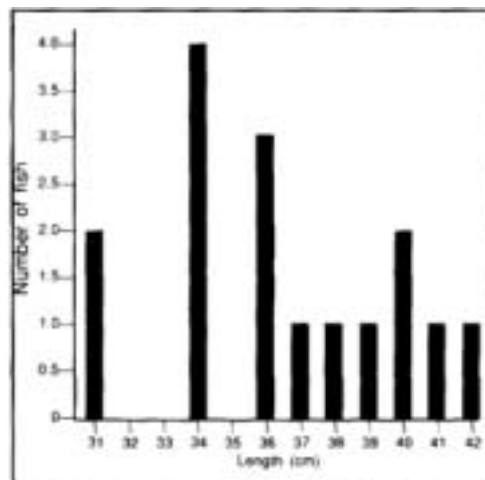


Fig 48b. Size group of Belanger's Croaker (*J. belangerii*)



Some less valuable species of croaker were also caught in insignificant quantities. Other varieties/species caught as by-catch included Catfish, skate and ray, Ribbonfish, Threadfin, Tasselfish, Queenfish, grunts etc. The percentage of by-catch varied from 20 per cent during the peak season to 45 per cent during the lean season.

### 36.5 Annual production

The estimated production of processed croaker, according to data collected from all the processing factories, is given alongside.

Level of production (range)	No. of factories	Total production (t)
Less than 50 t	7	142
50-90 t	2	145
Over 100 t	6	740
Total	15	1027

Applying the conversion rate used by the factories — that is, dry weight is 36 per cent of the wet weight, and assuming that the entire catch of croaker is for export, the total production of croaker in Bangladesh is estimated to be around 2850 t/year.

Out of the total quantity exported, approximately 7 per cent is estimated to come from other fisheries *i.e.* set bagnet, trawl and trammelnet fisheries etc. Hence, the annual production from the longline fishery is around 2650 t.

Considering the total production of 2650 t (*i.e.* 93 per cent of the total exported quantity, with an average catch of 104 kg/boat/day), an effort of 25,480 boat-days would have been applied in this fishery. Taking the average number of fishing days per month to be 18 and the number of months operated as five, the number of boats engaged in this fishery is estimated to be approximately 280.

### 36.6 Processing and marketing

During 4-day fishing trips, the fish is salted on deck, the salt being applied into the visceral cavity. The salt used for on-board processing is one-third the weight of the fish. On-board processing is not carried out during day-trips.

There are, at present, 15 processing factories purchasing croaker for processing and export — twelve in Cox's Bazar, one at Teknaf in the Cox's Bazar District and the other two in Dubla and Mohipur in Patuakhali District.

After purchase, the fish is sorted into 'white', 'red' and 'black' croaker, according to the colour of the skin, and then graded on the basis of their sizes. Those larger than 9" are taken as Grade 1 and those from 7-9" as Grade 2. Fish smaller than 7" are not exported, but sold in the local market.

Most exports are to Hong Kong. After grading, the fish is salted — as in the on-board processing and kept for about 8-20 hours in concrete or wooden tanks, for dehydration. The fish salted by fishermen at sea take less curing time than those salted ashore. After salting, the flesh of the fish becomes very soft. The salted fish is then descaled, washed in water and finally washed in a mix of water and some chemicals of unknown composition that are supplied by the buyers. After sun-drying for 5-7 days, the dried fish are again graded by size and packed into 15 kg packages wrapped in polyethylene for shipment.

The quantities of dried croaker exported, the total value and the value per kg during the last five years are given below

Year	Exported amount (kg)	Value (US \$)	Price/kg (US \$)
1986-87	135,704	612,197	4.51
1987-88	185,516	685,186	3.69
1988-89	845,192	4,508,405	5.33
1989-90	1,152,700	5,321,978	4.33
1990-91	1,087,718	3,882,927	3.57

Source: Quality Control Laboratory, Office of the Dept. of Fisheries, Chittagong.

### 37. ECONOMICS OF THE LONGLINE FISHERY

A cost and earnings analysis (Table 29) shows that the variable cost of the fishery is on account of the fuel, food, bait, salt, repair/replacement of lost/damaged gear etc. The price of bait is 35-45 Tk/kg. The cost of craft and gear are Tk. 2,500,000 and Tk.4,000 and their average life 15 years and 1 year, respectively. The estimate of the cost and earnings for a unit during the whole fishing season is presented in Table 30.

**Table 29: Cost and earning analysis of the bottom longline fishery for croaker and the average income to owner and crew member per trip. (Values are in Tk\*)**

<i>Pethtd</i>	<i>Duration of trip (days)</i>	<i>Avg. value of catch (Tk)</i>	<i>Avg bait cost (Tk)</i>	<i>Avg. fuel cost per trip (Tk)</i>	<i>Fttd cost per trip (Tk)</i>	<i>Salt cost per trip (Ti)</i>	<i>Add. hooks (Tk)</i>	<i>Net revenue (Tk)</i>	<i>Ciew share (Tk)</i>	<i>Skipper share (Tk)</i>	<i>Boat owner (Tk)</i>
Aug.. Oct. & Feb.	1	4796	700	1700	500	.	500	1396	73	46	587
Nov. - Jan.	4	18,136	700	2000	2000	800	600	2.036	633	266	5068

\* US \$ 1 = Tk 32 appx. (1991).

**Table 30: Costs and earnings of a bottom longlining unit, for the whole season (values are in Tk)**

	<i>Variable cost</i>	<i>Depreciation &amp; maintenance</i>	<i>Salaries/ Shares</i>	<i>Total cost</i>	<i>Total revenue</i>	<i>Profit to owner</i>
Peak season Nov. - Jan. (3 months)	82.350	5775	93,984	182,109	244,836	62,727
Lean season Aug., Oct., Feb (Mid-Aug. to Mid-Feb. 2 months)	122.400	3850	28,798	155.048	172.656	17.608
**Annual	204,750	9625	122,782	337.157	417,492	80.335

-- Here 'annual' means one season. i.e. the five-month fishing period.

- a) Depreciation of fixed cost/month = Tk 1390 + Tk 335 = Tk 1725
- b) Variable cost/month = Tk 61,200 (for day trips)  
= Tk 27,450 (for 4-day trips)\*\*\*
- c) Gross revenue/month = Tk 86,328 (for day trips)  
= Tk 81,612 (for 4-day trips)
- d) Profit/month = Tk 25,128 (for day trips)  
= Tk 54,162 (for 4-day trips)

--- Variable costs are less for a month with 4-day trips because there are fewer trips per month, resulting in fuel cost being substantially less for approximately the same number of fishing days.

After deducting the variable cost from the gross revenue, the balance is shared on the basis of eight shares for the craft owner, two for the head fisherman and one each for the nine crew members.

Major repairs and maintenance of the boat and gear, about 200 Tk/month, are borne by the boat-owner. Therefore, after deducting the depreciation and maintenance cost, the boat-owner gets 8804 Tk/month in the lean season and 20,909 Tk/month in the peak season.

The fish is sold to the factory with the swim bladder intact and the fishermen do not get any additional payment for this. The swim bladder of Silverpennah Croaker and Belanger's Croaker is worth 200 Rs/kg (dried) and that of the larger Spotted Croaker 1000 Tk/kg (dried). The factory owners sell these to middlemen linked with the export of this product – 'icing glass'.

### 37.1 Socioeconomics

The fishermen engaged in longlining are traditional small-scale fishermen. These fishermen have diversified from set bagnet and gilinet fisheries because of better income in the longline fishery during the season. From Table 2 it appears that the monthly average income per fisherman is Tk.1309 for the lean season (day trip) and Tk.2848 for the peak season (4-day trip). They engage in set bagnet, gilinet, other types of longline fisheries, agriculture etc., during the rest of the year.

## ERRATA

Page i, Line-6, Z A Chowdhury instead of S A Chowdhury.

Page ii, Line-14, the Marine Fisheries Survey, Management and Development Project, instead of the Management and Development Project.

Page 29, Table-14, SI. No-9, F. *tetradactylum* instead of *H. tetradactylum*.

Page 42, Table-17, SI. No-2, value of K : .44 instead of .55.

Page 55, Line-11, Fiftyone species/groups instead of fourteen species/groups.

Page 65, Line-4, Md. N Sada instead of Md. U Sada.

Page 91, Line-17, r.v. *Machhranga* instead of r.v. *Mastsuranga*.

Line-21, Mustafa *et al.* instead of Mustapha *et al.*



## **PUBLICATIONS OF THE BAY OF BENGAL PROGRAMME (BOBP)**

The BOBP brings out the following types of publications:

*Reports* (BOBP/REP/...) which describe and analyze completed activities such as seminars, annual meetings of BOBP's Advisory Committee, and subprojects in member-countries for which BOBP inputs have ended.

*Working Papers* (BOBP/WP/...) which are progress reports that discuss the findings of ongoing work.

*Manuals and Guides* (BOBP/MAG/...) which are instructional documents for specific audiences.

*Information Documents* (BOBP/INF/...) which are bibliographies and descriptive documents on the fisheries of member-countries in the region.

*Newsletters* (*Bay of Bengal News*) which are issued quarterly and which contain illustrated articles and features in nontechnical style on BOBP work and related subjects.

*Other publications* which include books and other miscellaneous reports.

Those marked with an asterisk (\*) are out of stock but photocopies can be supplied.

### **Reports (BOBP/REP/...)**

- 32.\* *Bank Credit for Artisanal Marine Fisherfolk of Orissa, India.* U. Tietze. (Madras, 1987.)
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34. *The Coastal Set Bagnet Fishery of Bangladesh – Fishing Trials and Investigations.* S. E. Akerman. (Madras, 1986.)
35. *Brackishwater Shrimp Culture Demonstration in Bangladesh.* M. Karim. (Madras, 1986.)
36. *Hilsa Investigations in Bangladesh.* (Colombo, 1987.)
37. *High-Opening Bottom Trawling in Tamil Nadu, Gujarat and Orissa, India: A Summary of Effort and Impact.* (Madras, 1987.)
38. *Report of the Eleventh Meeting of the Advisory Committee, Bangkok, Thailand, 26-28 March, 1987.* (Madras, 1987.)
39. *Investigations on the Mackerel and Scad Resources of the Malacca Straits.* (Colombo, 1987.)
40. *Tuna in the Andaman Sea.* (Colombo, 1987.)
41. *Studies of the Tuna Resource in the EEZs of Shri Lanka and Maldives.* (Colombo, 1988.)
42. *Report of the Twelfth Meeting of the Advisory Committee.* Bhubaneswar, India, 12-15 January 1988. (Madras, 1988.)
43. *Report of the Thirteenth Meeting of the Advisory Committee.* Penang, Malaysia, 26-28 January, 1989. (Madras, 1989.)
44. *Report of the Fourteenth Meeting of the Advisory Committee.* Medan, Indonesia, 22-25 January, 1990. (Madras, 1990.)
45. *Gracilaria Production and Utilization in the Bay of Bengal Region: Report of a seminar held in Songkhla, Thailand, 23-27 October 1989.* (Madras, 1990.)
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51. *Report of the Seminar on the Mud Crab Culture and Trade in the Bay of Bengal Region, November 5-8, Surat Thani, Thailand.* Ed by C.A. Angell. (Madras, 1992.)
52. *Feeds for Artisanal Shrimp Culture in India – Their Development and Evaluation.* J F Wood et al. (Madras, 1992.)
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56. *A Study on Dolphin Catches in Shri Lanka.* L Joseph. (Madras, April 1993.)
57. *Introduction of New Outrigger Canoes in Indonesia.* G Pajot, O. Gulbrandsen. (Madras, 1993.)
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63. *Small-scale Oyster Culture on the West Coast of Peninsular Malaysia.* D. Nair, R. Hall, C. Angell. (Madras, 1993.)

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56. *Fishing Trials with Beachlanding Craft at Uppada, Andhra Pradesh, India.* L. Nyberg. (Madras, 1987.)
57. *Identifying Extension Activities for Fisherwomen in Vishakhapatnam District, Andhra Pradesh, India.* D. Tempelman. (Madras, 1987.)
58. *Shrimp Fisheries in the Bay of Bengal.* M. Van der Knaap. (Madras, 1989.)
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65. *Seaweed (Gracilaria Edulis) Farming in Vedalai and Chinnapalam, India.* I. Kalkman, I. Rajendran, C. L. Angell. (Madras, 1991.)
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71. *Manual Boat Hauling Devices in the Maldives.* (Madras, 1992.)
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81. *Exploratory Fishing for Large Pelagic Species in South Indian Water.* J. Gallene, R. Hall. (Madras, 1992.)
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87. *Market Study of Tiger Shrimp Fry in West Bengal, India.* **M.M. Raj, R. Hall.** (Madras, 1993.)
88. *The Shrimp Fry By-catch in West Bengal.* **B.K. Banerjee, H. Singh.** (Madras, 1993.)
89. *Studies of Interactive Marine Fisheries of Bangladesh.* **Md. S. Islam, Md. G. Khan, S.A. Quayum, Md. N. Sada, Z.A. Chowdhury, S.C. Paul, Md. G. Mustafa, S.A. Chowdhury, Q.M. Huq, Md. N. Sarker,** Management and Development Project, Department of Fisheries, Chittagong, Bangladesh. (Madras, 1993.)
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3. *Fishery Statistics on the Microcomputer: A BASIC Version of Hasselblad's NORMSEP Program.* **D. Pauly, N. David, J. Hertel-Wulff.** (Colombo, 1986.)
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5. *Bay of Bengal Fisheries Information System (BOBFINS): User's Manual.* (Colombo, 1987.)
6. *A Manual on Rapid Appraisal Methods for Coastal Communities.* **P. Townsley.** (Madras, 1993.)
7. *Guidelines for Extension Workers in Group Management. Savings Promotion and Selection of Enterprise.* **H. Setyawati, P. Limawan.** Directorate General of Fisheries, Ministry of Agriculture, Government of Indonesia, Jakarta and Bay of Bengal Programme. (In Indonesian). (Madras, 1992.)
8. *Extension Approaches to Coastal Fisherfolk Development in Bangladesh: Guidelines for Trainers and Field Level Fishery Extension Workers.* Department of Fisheries, Ministry of Fisheries and Livestock, Government of Bangladesh and Bay of Bengal Programme. (In Bangla). (Dhaka, 1992.)
9. *Guidelines on Fisheries Extension in the Bay of Bengal Region.* I Jungeling. (Madras, 1993.)
10. *Our Fish, Our Wealth. A guide to fisherfolk on resources management. — In 'comic book' style (English/Tamil/Telugu).* **K. Chandrakant** with **K. Sivasubramaniam, R. Roy.** (Madras, 1991.)
12. *How to Build a Timber Outrigger Canoe.* **O. Gulbrandsen.** (English and Bahasa Indonesia). (Madras, 1993.)
13. *A Manual for Operating a Small-scale Recirculation Freshwater Prawn Hatchery.* **R. Chowdhury, H. Bhattacharjee, C. Angell.** (Madras, 1993.)
14. *Building a Lifiable Propulsion System for Small Fishing Craft — The BOB Drive.* **O. Gulbrandsen, M R Andersen.** (Madras, 1993.)
15. *Guidelines for Fisheries Extension in the Coastal Provinces of Thailand.* **Fishery Extension Division;** Department of Fisheries, Ministry of Agriculture and Cooperatives, Bangkok, Thailand, and the Bay of Bengal programme. (In Thai). (Bangkok, 1993.)
16. *Safety Guide for Small Offshore Fishing Boats.* **O. Gulbrandsen.** (Madras, 1993.)
17. *Guidelines for Cleaner Fishery Harbours.* **R. Ravikumar.** (Madras, 1993.)
18. *A Handbook of Oyster Culture.* **Md. Yatim.** (In English and Malay). (Madras, 1993.)

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- II. *Marine Small-Scale Fisheries of West Bengal: An Introduction.* (Madras, 1990.)
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13. *Bibliography on the Mud Crab Culture and Trade in the Bay of Bengal Region.* (Madras, 1992.)

#### **Newsletters (Bay of Bengal News)**

Quarterly from 1981

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- I. *Helping Fisherfolk to Help Themselves : A Study in People's Participation.* (Madras, 1990.)
2. *The Shark Fisheries of the Maldives.* **R.C. Andersen, H. Ahned.** Ministry of Fisheries and Agriculture, Maldives. (Madras, 1993.)

#### **NOTE:**

Apart from these publications, the BOBP has brought out several folders, leaflets, posters etc., as part of its extension activities. These include Post-Harvest Fisheries folders in English and in some South Indian languages on anchovy drying, insulated fish boxes, fish containers, ice boxes the use of ice etc. Several unpublished reports connected with BOBP's activities over the years are also available in its Library.

#### **For further information contact.**

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