

# Summary Report of Fishing Trials with Large-Mesh Driftnets in Bangladesh



SUMMARY REPORT OF  
FISHING TRIALS WITH LARGE-MESH DRIFTNETS  
IN BANGLADESH

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Development of Small-Scale Fisheries in the Bay of Bengal. Madras, India, May 1986.  
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This document reports on a fishing gear improvement project in Bangladesh. It describes the findings of fishing trials with large-mesh driftnets of thinner twine with different mesh sizes and made of different materials.

Two working papers on the subject have been published earlier as BOBP/WP/5 ("Improvement of Large-Mesh Driftnets for Small-Scale Fisheries in Bangladesh") and BOBP/WP/12 ("Trials in Bangladesh of Large-Mesh Driftnets of Light Construction"). Two other papers on Bangladesh fishing gears have also been published : BOBP/WP/13 ("Trials of Two-Boat Bottom Trawling in Bangladesh") and BOBP/WP/15 ("Pilot Survey of Driftnet Fisheries in Bangladesh").

The trials described in this paper started in 1979-80. They were conducted in cooperation with the Kalidaha Fishing Project of CARITAS, a social service organization, and the Marine Fisheries Department, Bangladesh, which provided local counterparts (Mr. T. K. Das, fishing technologist, and Mr. A. Bashiruddin, Assistant Inspector of Fisheries) for monitoring. A number of private fishermen also participated in the trials.

The fishing gear improvement project is an activity of the small-scale fisheries project of the Bay of Bengal Programme (BOBP). The project is funded by SIDA (Swedish International Development Authority) and executed by the FAO (Food and Agriculture Organization of the United Nations) and covers five countries bordering the Bay of Bengal — Bangladesh, India, Malaysia, Sri Lanka and Thailand. The main goals of the project are to develop, demonstrate and promote appropriate technologies and methodologies to improve the conditions of small-scale fisher-folk in member countries.

This document is a technical report and has not been cleared either by the Government concerned or by the FAO.

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## **1. INTRODUCTION**

Artisanal fisheries account for about 95% of the marine fish catch in Bangladesh. The set bagnet is the most important method of capture: about 40% of the total marine catch is taken by this means. Driftnets account for approximately 30%. The small-mesh nets (75-125 mm mesh size) are used much more extensively than the large-mesh nets (180-200 mm mesh). The former are used to catch hilsa, pomfret, etc., while the latter catch larger species like Indian salmon, cock-up, large jewfish, triple tail, red snappers, catfish, shark, ray and skate, etc.

The large-mesh driftnet fishery is based in Chittagong. The main fishing grounds are located some 40 miles off the eastern coast of Bangladesh. Some 100-150 large-mesh units are said to operate from Penthaghata, Chittagong. The main season for the large-mesh driftnet fishery is winter (October-March).

## **2. OBJECTIVES**

With costs of synthetic material for fishing nets rising, one way to make the operations more economical is to reduce the weight of the netting material, provided efficiency is not impaired. Nets of thinner twine are generally known to be more effective since they entangle the fish easier. As for alternative materials, polyethylene (PE) offers possibilities — it is cheaper than nylon (PA) as well. The principal objectives of the studies were to :

- i. compare the catching efficiency of traditional large-mesh nylon (PA) driftnets with nylon driftnets of thinner twine.
- ii. compare the catching efficiency of nets of different mesh sizes.
- iii. study the suitability of cheaper netting material such as polyethylene (PE).
- iv. demonstrate and disseminate to small-scale fishermen/boat owners any conclusive results achieved during the experimental fishing and promote follow-up action.

## **3. CONDUCT OF FISHING TRIALS**

### **3.1 General**

Trials were conducted during the winter season of 1979/80, 1980/81, 1981/82 and 1982/83, mainly to compare the economics and catch efficiencies of experimental nets made from thin-twine PA R 680 and 760 tex (210 d 27-30) and traditional nets made from thicker twine PA R 1135-1520 tex (210d 45-60).

The trials included occasional experiments with driftnets made of PE (thin twine), trials with different mesh sizes, trials with driftnets during the night and pair trawling during the day.

### **3.2 Organization**

The trials were conducted during the period 1979/80 to 1982/83 in cooperation with CARITAS a voluntary agency, through its Kalidaha Fishing Project (KFP) near Chittagong. Under an agreement between BOBP and KFP, BOBP provided nylon driftnets of thinner twine. KFP used these nets for commercial fishing operations along with traditional PA driftnets of thicker twine. The KFP recorded catch data, running expenses, etc. All the proceeds from the sale of

catches went to KFP as compensation for running expenses and services rendered in the course of the trials.

In 1980/81, experiments with PA driftnets of different mesh sizes (100-125-150-175 mm) were also carried out in cooperation with the KFP. BOBP guaranteed that the gross earnings for the boat for the full season (November 1980-February 1981) would be at least Tk 75,000 and agreed to supplement the income from sale of catch if necessary.

Trials were also conducted in cooperation with selected private fishermen/boat owners operating PA large-mesh driftnets. BOBP provided them at cost with a sufficient number of large mesh PA driftnets (stretched mesh size 180 mm, twine size PA R 680 tex) during 1981/82 and (stretched mesh size 200 mm, twine size PA R 760 tex) during 1982/83 — 1984/85. The fishermen used the nets along with their own traditional nets in commercial fishing operations and recorded the catches of both types to the best of their ability. All the proceeds of fish and sales went to the fishermen/boat owners.

To popularize the use and propagate the advantage of thinner twine for large mesh driftnetting, a poster was produced ; it was distributed among fishermen and fishing centres.

BOBP also took steps to make the thin-twine nets more easily available. This was done by getting women from villages near Chittagong to hand-braid the thin-twine nets: the women were supplied the twine and paid a wage for hand-braiding. This was the main component of a parallel BOBP activity to improve the incomes of fisherwomen (reported in BOBP/REP/24, "Fisherwomen's Activities in Bangladesh : A Participatory Approach to Development").

To encourage importers to start importing thinner PA twine, information meetings were held between representatives of the Department of Fisheries, importers and fishermen.

### 3.3 Monitoring of fishing trials

- Data for comparing the catches and relative efficiencies of different types of nets were collected daily on board the craft by extension workers of the Kalidaha Fishing Project during the fishing season 1979/80 and also by BOBP's counterparts along with KFP's extension workers during the fishing seasons 1980/81 and 1981/82. During fishing season 1982/83, data aboard was provided by the head fisherman. Compilation of data was done by BOBP's counterparts.
- Data from the private parties engaged in the trials were collected by BOBP's counterparts from the Marine Fisheries Department which also took care of additional monitoring and compiling of raw data.
- The trials were carried out with Chittagong at the base, in an area about 40 miles off the eastern coast of Bangladesh between Chittagong and Cox's Bazaar. The location is shown in Appendix 1.

### 3.4 Study tours

In 1980, two assistant fishing technologists and a fisherman attached to BOBP visited Sri Lanka to study the extensive large-mesh driftnet fisheries there. The arrangements were made by the Sri Lanka Ministry of Fisheries and BOBP.

In 1982 BOBP sponsored a similar study tour to Sri Lanka for the counterparts.

## **4. FISHING CRAFTS AND GEARS**

### **4.1 Boats**

The fishing boats participating in the trials were of standard design, common in Chittagong. Photographs are shown in Appendix 2.

The main characteristics of these boats are:

Length (m)	12 - 14
Breadth (m)	3 - 3.6
Draft (m)	1 - 1.2
Gross tonnage (ton)	8- 10
Engine (hp)	22 - 33
Crew (persons)	6 - 8

### **4.2 The Driftnets**

The traditional large-mesh driftnet used in the commercial fishery is shown in Appendix 3. The experimental nylon net introduced by the BOBP is shown in Appendix 4.

The experimental nets differed from the traditional only in netting material and yarn size. In other characteristics, the traditional and the experimental nets were identical.

### **4.3 Fishing operations**

The length of a fleet of large mesh driftnets operated by the boats during the trials was 1400 — 1800 m. Normally, fishing was done both during the day and the night. The nets were shot and hauled twice a day if possible, usually during inter-tidal periods with slack water.

A normal fishing trip lasted 5-8 days depending on the weather, catches and other unpredictable factors. Most of the fishing took place in locations of 10-18 metres water depth within the main fishing ground.

## **5. FINDINGS**

The first year's (1979/80) fishing trials employing a small number of experimental nylon nets of thinner twine indicated that their catch efficiency was much higher than that of the traditional nets. The catch rate (pieces of fish per net set standardized to a hung length of 100 m) was 1.45 against 0.86.

The trials during the second and third year—there was a six fold increase in number of nets (and boats) over the previous year during both years — confirmed the superiority of the lighter nets.

In the fourth year (1982/83), during which the effort in terms of experimental nets had doubled from the previous year, the recorded data show the catch efficiency between the experimental and traditional nets to be about equal. Details are given in the table below:

## CATCH AND EFFORT RECORD OF TRADITIONAL AND EXPERIMENTAL NETS

	<i>Traditional Nets</i>	<i>Experimental Nets</i>
	Nylon multifilament 180-200 mm mesh PAR 1135-1515 tex (210d 45-60)	Nylon multifilament 180-200 mm mesh PA R 680 – 760 tex (210d 27-30)
<b>1979/80</b>		
Effort: no. of net sets, 100 m (hung)	1,260	334
Catch (pcs)	1,090	484
Catch rate (pcs/effort)	0.86	1.45
<b>1980/81</b>		
Effort: no. of net sets, 100 m (hung)	4,266	1,818
Catch (pcs)	3,606	2,705
Catch rate (pcs/effort)	0.85	1.49
<b>1981/82</b>		
Effort: no. of net sets, 100 m (hung)	5,832	10,409
Catch (pcs)	4,019	12,496
Catch rate (pcs/effort)	0.69	1.20
<b>1982/83</b>		
Effort: no. of net sets, 100 m (hung)	4,197	21,144
Catch (pcs)	2,855	12,832
Catch rate (pcs/effort)	0.68	0.61

The different catch efficiency picture that emerged from the 1982/83 trials is not fully understood. In general, that fishing season was not as good as the previous ones; but of the three traditional boats monitored, one was reported to have had exceptionally good catches, and that pushed up the average for the traditional boats.

Nevertheless, the superiority of the lighter nets was recognized by many fishermen even after the second year's trials. This allowed expansion of effort during the 1981/82 and 1982/83 trials.

Even with equal catch efficiency, there is an incentive for the fishermen to use the lighter nets since they are 30-40% cheaper than the traditional nets.

The main worry of the fishermen was that the thinner twine would not be strong enough. Damage sustained to nets during the fishing operations was therefore closely observed. There was no significant difference between the thinner and thicker PA twine in this respect.

By 1984 about 50% of the large mesh driftnetters operating from Chittagong were equipped with thin-twine nets. Most of the nets were made available at full cost through the BOBP-supported project for fisherwomen in villages near Chittagong.



The meeting with fishermen, boat owners and twine importers did not significantly boost the import of thin twine for construction of large mesh driftnets. Reason: scarcity of foreign exchange compels businessmen to confine their imports to high-profit and high-opportunity areas. The large-mesh driftnet fishery does not rank as either a high-profit or high-opportunity area in the importer's scheme of things, and support by the government institutions concerned appears to be needed.

Other findings of the trials are :

- PE nets of thinner twine recorded catches nearly as good as the PA nets during the limited first season trials (1979/80). But they were also more prone to damage and made time-consuming repairs necessary.
- The 1980/81 trials with different mesh sizes — 100, 125, 150 and 180 mm — yielded catches per set of a length of 450 mm net as follows :

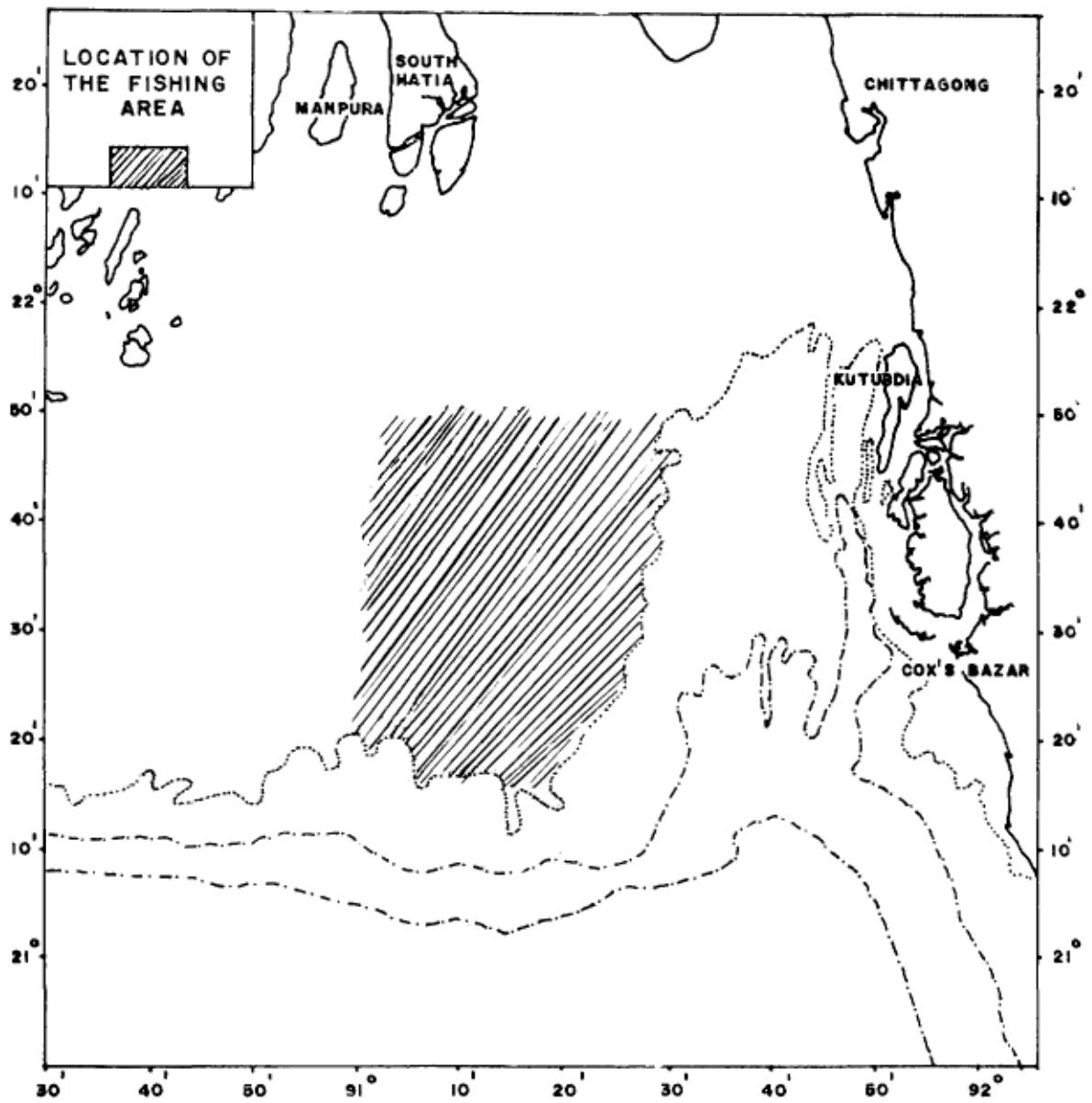
100 mm	9.70 kg
125 mm	29.70 kg
150 mm	32.25 kg
180 mm	57.20 kg

Besides significantly higher catches, the large mesh size nets proved to be more appropriate for catching the higher market-value target species.

- Combining large-mesh driftnet fishery during the night with two-boat trawling during the day did not prove to be feasible. Profitability was higher with the driftnets only.
- The study tours to Sri Lanka were highly appreciated by the participants. The large-mesh driftnet fisheries in Sri Lanka differ from those of Bangladesh in respect of mesh sizes, species etc., but many aspects of the fishing operations are common. The participants quickly understood the financial benefits of the use of thinner twine and the desirability of systematic trials and demonstrations of thinner-twine nets in Bangladesh.
- The impact of posters concerning the merits of thin-twine nets was limited. It is possible that the posters were not displayed at the right places to reach the target group of fishermen.

Appendix 1

MAP INDICATING THE LOCATION OF THE FISHING AREA



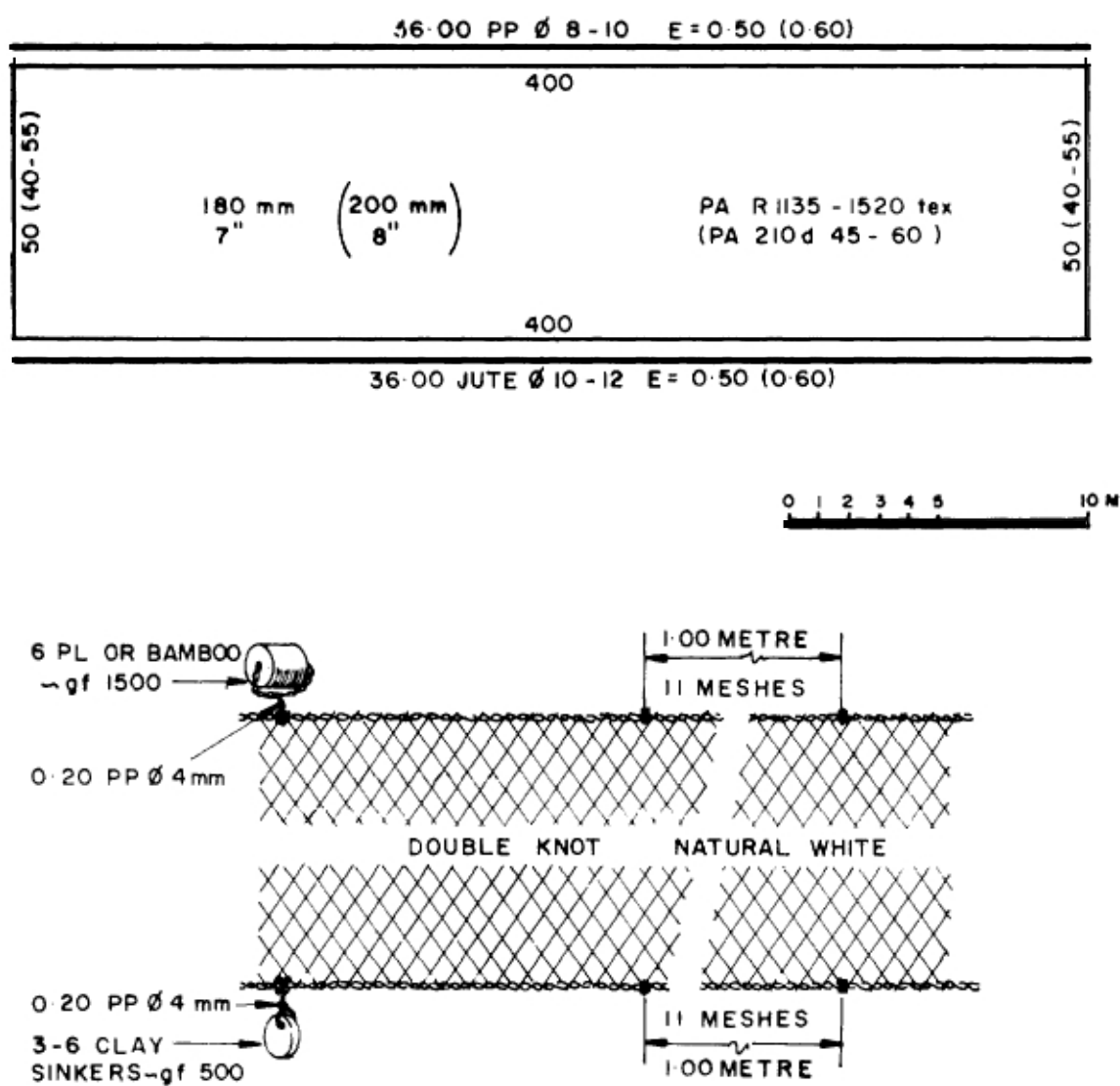
## Appendix 2

### BOATS USED IN THE EXPERIMENTS WITH LARGE-MESH DRIFTNETS IN BANGLADESH



# Appendix 3

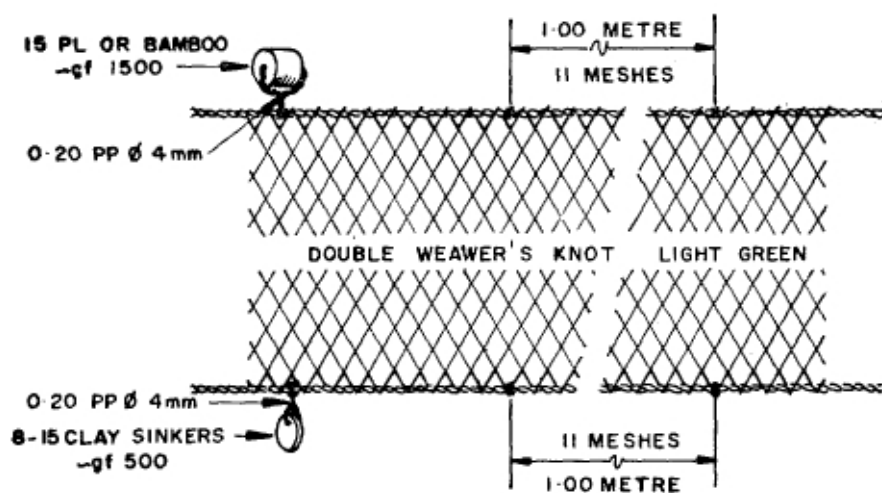
## DESIGN OF TRADITIONAL LARGE-MESH DRIFTNET (PA)



# Appendix 4

## DESIGN OF EXPERIMENTAL LARGE-MESH DRIFTNET (PA)

90.00 PP Ø 10 E = 0.50				
50 (45)	1000			50 (45)
	180 mm (200 mm)			
	7" (8")			
	1000			
PA R 680 - 760 tex (PA 210 d 27-30 )				
90.00 JUTE Ø 10-12 E = 0.50				





## *Publications of the Bay of Bengal Programme (BOBP)*

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The BOBP brings out six types of publications:

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

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

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

*Miscellaneous Papers* (BOBP/MIS/. . .) concern work not originated by BOBP staff or consultants — but which is relevant to the Programme's objectives.

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

*Newsletters* (*Bay of Bengal News*), issued quarterly, contain illustrated articles and features in non-technical style on BOBP work and related subjects.

A list of publications follows.

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

1. Report of the First Meeting of the Advisory Committee. Colombo, Sri Lanka, 28-29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
2. Report of the Second Meeting of the Advisory Committee. Madras, India, 29-30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
3. Report of the Third Meeting of the Advisory Committee. Chittagong, Bangladesh, 1-10 November 1978. Colombo, Sri Lanka, 1978. (Reissued Madras, India, September 1980)
4. Role of Women in Small-Scale Fisheries of the Bay of Bengal. Madras, India, October 1980.
5. Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development. Madras, India, 3-8 September 1979. Madras, India, April 1980.
6. Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries. Colombo, Sri Lanka, 8-12 October 1979. Madras, India, June 1980.
7. Report of the Fourth Meeting of the Advisory Committee. Phuket, Thailand, 27-30 November 1979. Madras, India, February 1980.
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9. Report of the Training Course for Fish Marketing Personnel of Tamil Nadu. Madras, India, 3-14 December 1979. Madras, India, September 1980.
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12. Report of the Training Course for Fish Marketing Personnel of Andhra Pradesh. Hyderabad, India, 11-26 November 1980. Madras, India, September 1981.
13. Report of the Sixth Meeting of the Advisory Committee. Colombo, Sri Lanka, 1-5 December 1981. Madras, India, February 1982.
14. Report of the First Phase of the "Aquaculture Demonstration for Small-Scale Fisheries Development Project" in Phang Nga Province, Thailand. Madras, India, March 1982.
15. Report of the Consultation-cum-Workshop on Development of Activities for Improvement of Coastal Fishing Families. Dacca, Bangladesh, October 27-November 6, 1981. Madras, India, May 1982.
16. Report of the Seventh Meeting of the Advisory Committee. New Delhi, India, January 17-21, 1983. Madras, India, March 1983.
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19. Report of the Eighth Meeting of the Advisory Committee. Dhaka, Bangladesh, January 16-19, 1984. Madras, India, May 1984.
20. Coastal Aquaculture Project for Shrimp and Finfish in Ban Merbok, Kedah, Malaysia. Madras, India, December 1984.
21. Income-Earning Activities for Women from Fishing Communities in Sri Lanka. Edeltraud Drewes. Madras, India, September 1985.

22. Report of the Ninth Meeting of the Advisory Committee. Bangkok, Thailand, February 25-26, 1985. Madras, India, May 1985.
23. Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka. Madras, India, March 1986.
24. Fisherwomen's Activities in Bangladesh. A Participatory Approach to Development. Patchanee Natpracha. (In preparation)
25. Attempts to Stimulate Development Activities in Fishing Communities of Adirampattinam, India. (In preparation)
26. Report of the Tenth Meeting of the Advisory Committee. Male, Maldives. 17-18 February 1986. Madras, India, April 1986.
27. Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India. Edeltraud Drewes. Madras, India, May 1986.
28. Small-Scale Aquaculture Development Project in South Thailand: Results and Impact. E. Drewes. (In preparation)
29. Towards Shared Learning: An Approach to Nonformal Adult Education for Marine Fisherfolk of Tamil Nadu, India. L. S. Saraswathi and Patchanee Natpracha. Madras, India (In preparation)
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8. Current Knowledge of Fisheries Resources in the Shelf Area of the Bay of Bengal. B. T. Antony Raja. Madras, India, September 1980.
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16. Further Trials with Bottom Longlines in Sri Lanka. Madras, India, July 1982.
17. Exploration of the Possibilities of Coastal Aquaculture Development in Andhra Pradesh, Solch Samsi, Sihar Sircgar and Martono of the Directorate General of Fisheries, Jakarta, Indonesia. Madras, India, August 1982.
18. Review of Brackishwater Aquaculture Development in Tamil Nadu. Kasemsant Chalayondeja and Anant Saraya of the Department of Fisheries, Thailand. Madras, India, September 1982.
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24. Traditional Marine Fishing Craft and Gear of Orissa. P. Mohapatra. Madras, India, April 1986.
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21 issues quarterly from January 1981 to March 1986.