

# REPORT OF THE THIRTEENTH MEETING OF THE ADVISORY COMMITTEE

Penang, Malaysia  
January 26-28, 1989



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Executing Agency :  
Food and Agriculture Organization  
of the United Nations

Funding Agencies :  
– Danish International  
Development Agency  
– Swedish International  
Development Authority

Executing and funding agency for the BOBP's  
post harvest fisheries project is the  
Overseas Development Administration (U.K. )

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Bay of Bengal Programme for Fisheries Development.  
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This document records the recommendations of the 13th meeting of the Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP), held 26-28 January at Penang, Malaysia. The meeting was held in conjunction with the sixth session of the Bay of Bengal Committee (Indian Ocean Fishery Commission's Committee for the Management and Development of Fisheries in the Bay of Bengal.)

The document includes the annual reports for 1988 of the project "Small-Scale Fisher-folk Communities in the Bay of Bengal," GCP/RAS/118/MUL, funded by DANIDA and SIDA, and of the BOBP's Post Harvest Fisheries Project, funded and executed by the ODA.

The report also contains two papers presented to the Bay of Bengal Committee – the 1987-1988 consolidated progress report of the BOBP, and a paper on "Critical issues for fisheries development in the Bay of Bengal region".

The BOBP's Advisory Committee is composed of member countries, agencies funding BOBP projects, and the FAO. The committee meets once a year in member-countries on a rotational basis.

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## **REPORT OF THE THIRTEENTH MEETING OF THE ADVISORY COMMITTEE BAY OF BENGAL PROGRAMME FOR FISHERIES DEVELOPMENT**

### *Opening of the meeting*

1. The Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP) held its Thirteenth Meeting 26-28 January 1989 at the Orchid Hotel, Penang, Malaysia. A list of participants is given in Appendix A.
2. The Meeting was formally inaugurated, together with the Sixth Session of the IOFC Committee for the Development and Management of Fisheries in the Bay of Bengal, on 23 January 1989 by the Honourable Deputy Minister of Agriculture for Malaysia, Encik Mohd. Kassim Bin Ahmed.

### *Election of Chairman*

3. The Advisory Committee unanimously elected Mr Shahrom Abdul Majid, Director General of Fisheries, Malaysia, as its Chairman to hold office until the beginning of its Fourteenth Meeting.

### *Adoption of the Agenda*

4. The Advisory Committee adopted the agenda shown in Appendix B. The documents placed before the Committee are listed in Appendix C.

### **SMALL-SCALE FISHERFOLK COMMUNITIES (GCP/RAS/118/MUL & GCP/RAS/117/MUL)**

5. While extension activities should try to address the needs and aspirations of fisherfolk communities the fisheries focus of the programme should not be lost sight of. Non-fishery needs of communities should be addressed through catalytic and cooperative efforts involving other government and non-government agencies.
6. Participatory approaches should be emphasized in activities and efforts should be made to evolve guidelines, strategies and methods to enable participatory project identification and planning.
7. Guidelines should be developed for carrying out rapid, low cost analysis of community status/dynamics, needs and aspirations, to assist project identification, formulation and planning effort at the micro level.
8. Although extension efforts have to be planned in the context of long time periods, both short term and long-term strategies should be kept in mind when extension activities are designed.
9. The extension approaches used in the region in the field of fisheries (and in related fields to the extent where they may be applicable) and the experiences of such approaches, should be reviewed and discussed at a regional consultation to enable learning and new directions and approaches to fisheries extension.
10. The use of better management practices by fisherfolk in the running of their enterprises should be promoted, particularly through the development of methods and media.
11. Methods and media to enable participative community level approaches to resource management and environmental protection need to be developed and tested keeping in mind the need to work towards sustainable futures.
12. Modalities for enabling non-governmental organizations to amplify and enhance extension efforts for fisherfolk should be examined and used.
13. Extension services aimed at addressing the needs and aspirations of women and children in fisherfolk communities should be evolved and tested where feasible.
14. Link worker systems of fishermen and women should be encouraged as a low cost and effective extension mechanism.
15. Coastal aquaculture should continue to receive high priority within the project. Special attention should be paid to seed production, disease prevention and upgradation of culture technology.

16. Although the pen culture trials have resulted in failure, further research needs to be carried out on this technology by an appropriate institution.
17. In Indonesia the prawn fry distribution system needs to be studied with a view to improving its efficiency and prawn farm water management needs training support.
18. Consideration should be given to continue the work in regard to Artemia propagation after completion of the planned consultancy and workshop in India.
19. Even if oyster culture in Malaysia is found to be only marginally profitable, it should be assessed on its potential to increase cash earnings, in view of the low incomes of fisher-folk in the coastal areas.
20. Consideration should be given to Malaysia's renewed interest in seaweed farming.
21. In assisting prawn seed collectors in Bangladesh and India a cautious approach should be adopted because of the danger of destruction of juvenile fish; high priority should be given to development of small-scale hatcheries.
22. In connection with fishing craft development in Indonesia, the marketing aspects should be considered, in order to achieve not only increased production but also higher incomes for the fisherfolk.
23. High priority should be given to exploitation of underutilized resources wherever available.
24. Assistance to develop offshore fisheries for the small-scale sector should continue.
25. Promotion of low cost fishing craft in Sri Lanka should be continued
26. Fishing trials around artificial reefs to be deployed by the DOF in Ranong Province, Thailand should be supported.
27. The post harvest aspects on board fishing boats, e.g. use of ice, should be taken into account in all fishing boat development.
28. The possibilities of organizing joint operations involving large and small-scale operators for the utilization of Fish Aggregating Devices should be investigated.
29. Further efforts should be made to establish a joint monitoring system for the performance of the BLCs between the BOBP and the concerned governments in India.
30. High priority should be assigned to the subproject concerning Kattumaram Fisheries in Andhra Pradesh, India since the approach and methodology would be of interest to many other countries inside and outside the region. Activities should also be undertaken in Tamil Nadu.
31. Efforts need to be made to identify means of reducing the quantity of prawn trawler by-catch particularly in situations where it cannot be utilized.
32. The reasons for non-materialization of projects prepared on the basis of the results of BOBP activities should be analysed.
33. Project proposals scheduled for preparation during 1988 but not prepared, should be taken up under Development Support in 1989.
34. Procedures for processing project proposals by member governments and donor agencies should be examined to avoid bottlenecks and facilitate faster clearance of new national projects.
35. The promotion of project proposals which are still pending should be continued notwithstanding any delays encountered.
36. The proposed training in project preparation should receive high priority since this activity would help to improve and speed up the initiation of new development activities.
37. Liaison should be maintained with the IMO on matters concerning marine pollution and Search and Rescue (SAR).
38. The Information Service should more actively disseminate audio visuals and other material in addition to the newsletter and reports.
39. With reference to the subregional consultation on information conducted in 1988, all member countries should in future be invited to such activities even if the topic is considered to be of prime importance only to some countries.

40. Written extension material in Tamil already prepared by BOBP, should also be translated into Telugu, Bengali and Oriya.

#### TRAINING FOR SMALL-SCALE FISHERFOLK COMMUNITIES (GCP/RAS/126 AGF)

41. In addition to the activities proposed to be undertaken in 1989, training activities of a TCDC nature should be included if the countries concerned demonstrate their interest by cooperating in making necessary arrangements.

#### POST-HARVEST FISHERIES (ODA)

42. The overall direction and content of the project should continue to be maintained

43. The use of ice to maintain the quality of fish on-board fishing craft should be promoted where appropriate.

44. Economically viable means of landing prawn trawler by-catch which is currently being discarded at sea should be identified.

45. Prospects for improved commercial utilization of low value fish should be investigated

46. The development of a prawn feed manufacturing industry should be assisted. Low cost feeds including substitute materials for fish meal and using local ingredients need to be developed.

#### NATIONAL PROJECTS IMPLEMENTED THROUGH BOBP

47. The progress made under each of the four projects implemented through BOBP was noted but no specific recommendations were made.

#### PROPOSALS FOR NEW REGIONAL PROJECTS

48. In view of the reduced budget for the proposed project on "Bio- economics", which is likely to be approved in the near future, efforts should be made to seek additional funds from other donors, possibly for co-financing arrangements with the UNDP.

49. Member countries should consider their priorities vis-a-vis the three main objectives of the Bio-Economics project for discussion in the planning meeting which is scheduled to be the first activity of the project.

50. Member countries should ensure that the Bio-Economics project receives as high a priority rating as possible in their respective countries within the planning frame for regional UNDP support.

51. The proposal to further investigate the adverse effects on fisheries of pollution and deterioration of the environment in general should be strongly pursued. In doing so, there should be no deviation from the focus on fisheries aspects nor duplication of work already done or being done by other agencies. The project proposal should be modified accordingly.

52. In the preparation of a project document for investigation of the pollution effects on fisheries, full use should be made of the interest of DANIDA and SIDA in the subject of environment protection and IMO's willingness to cooperate during different stages of preparation and implementation of such a project.

53. The proposed preparatory activities relating to strengthening nutrition aspects of fisheries development should be pursued subject to the following considerations: that national efforts be taken into account in determining the needs and modalities; that activities be developed as complementary to sub-projects of the Programme where possible; and, special efforts be made to clarify the role of fisheries agencies in this multi-agency task.

54. The proposed project relating to learning about fisherfolk communication should be actively pursued keeping in mind that the subject matter of communication relates to the concern of BOBP and that, to the extent possible, the activities should be incorporated into subprojects of the Programme. Special consideration should be given to the role of women and children in communication.

55. The project on improving the living conditions of fisherwomen and their families, to be funded by UNFPA, was strongly recommended for implementation since it fits very well into BOBP's work on small-scale fisheries and general development strategies.

#### MID-TERM REVIEW OF GCP/RAS/118/MUL

56. The mid-term review should be implemented as stipulated in the project document. The proposed terms of reference of the mission should be modified to include concerns regarding the participation of women and environmental protection. Donors should be represented at the Mission's debriefing.

#### COOPERATION WITH OTHER ORGANIZATIONS

57. The Programme should make best use of the offer by SEAFDEC to cooperate in information systems and training in extension and post harvest technology.

#### OTHER MATTERS

58. BOBP should continue to produce annually a list of externally-supported regional and national projects in the Bay of Bengal region. The cooperating agencies should assist in keeping the list as accurate and up to date as possible.

59. Noting that Mr L Augustinson, Head, Agriculture Division of SIDA is due to retire from the service of his Organization during 1989, the Advisory Committee recalled his long association with the BOBP, expressed its appreciation of his great contribution to the work of the Programme and extended its best wishes to him for the future.

#### NEXT MEETING

60. The Fourteenth Meeting of the Advisory Committee should be held in January 1990. The offer to host the meeting in Indonesia, subject to formal Government confirmation, was noted with appreciation.

61. The agenda of the Fourteenth Meeting should provide for a discussion of the results of the mid term review of RAS/118/MUL and follow-up actions required in regard to projects scheduled to be terminated by the end of 1991.



Appendix A

LIST OF PARTICIPANTS

**Bangladesh**

Begum M.(Ms) Deputy Chief, Planning & Evaluation  
Cell, Ministry of Fisheries &  
Livestock, Dhaka

**DANIDA**

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Gaudet, G. L Senior Fishery Planning Officer, Rome

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Rome

Pietersz, V L C Regional Fishery Officer, RAPA  
Secretary, Bay of Bengal Committee  
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**India**

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Ministry of Food Processing Industries  
New Delhi

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Siregar, Z	Project Coordinator/ Actg.Head of North Sumatra Provincial Fisheries Service Medan, Sumatra

*Malaysia*

Shahrom Abdul Majid	Director General Department of Fisheries Kuala Lumpur
Tan Cheng Kiat	Director of Extension & Education Department of Fisheries Kuala Lumpur
Mahmood, R. (Ms)	Head of Fisheries Management Information System Department of Fisheries Kuala Lumpur
Merican, Z.O (Ms)	Senior Fisheries Officer (Development) Department of Fisheries Kuala Lumpur
Ong Kah Sin	Director of Research Fisheries Research Institute Penang
Lui Yean Pong	Senior Fisheries Officer Fisheries Research Institute Penang

*Maldives*

Hasen Didi, N T	Director of Extension Services Ministry of Fisheries and Agriculture Republic of Maldives
Hassan Maniku, M	Director of Fisheries Research & Development Marine Research Section Ministry of Fisheries and Agriculture Republic of Maldives

*ODA*

Ames, G.R	Acting Head Animal Products & Feeds Department Overseas Development Natural Resources Institute, London
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*SIDA*

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<i>SEAFDEC</i>	
Soodhom, S	Training Division Head Thailand
<i>UNDP</i>	
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*Secretariat- BOBP*

Engvall, L O

Angell, C

Pajot, G

Roy, R N

Sivasubramaniam, K

Townsley, P

Walker, D.J

Scurville, S (Ms)

Programme Director

Senior Aquaculturist

Senior Fishing Technologist

Extension/Training Officer

Senior Fishery Biologist

Sociologist (APO)

Post-Harvest Fisheries Adviser

Administrative Assistant

*Secretariat FAO*

Sanbua, P (Ms)

Boonymanop, K (Ms)

Meetings Officer

Secretary, RAPA

**Appendix B**

**AGENDA**

*26 JANUARY*

1. Opening of the meeting
2. Election of Chairman
3. Adoption of Agenda
4. Progress reports :
  - (a) Small-Scale Fisherfolk Communities (GCP/RAS/118/MUL) and (GCP/RAS/117/MUL)
  - (b) Training for Small-scale Fisherfolk Communities (GCP/RAS/126/AGF)

*27 JANUARY*

4. Progress report (contd.)
  - (c) Post-Harvest Fisheries (ODA)
  - (d) National projects implemented through BOBP
5. Proposals for new regional projects.
6. Mid-term review of GCP/RAS/118/MUL
7. Cooperation with other organizations.
8. Other matters.
9. Next meeting.

*28 JANUARY*

10. Adoption of the report.

## **Appendix C**

### **LIST OF DOCUMENTS**

1. List of Documents
2. Agenda
3. GCP/RAS/118/MUL & GCP/117/MUL - Annual Report 1988
4. GCP/RAS/126/AGF - Status Report
5. ODA Post Harvest Fisheries Project - Annual Report 1988
6. Annual Report (1988) of national BOBP projects.
7. Proposals for new regional projects.
8. Proposed terms of reference for the mid-term review of GCP/RAS/118/MUL.
9. List of participants

## **Appendix D**

### **GCP/RAS/118/MUL & GCP/RAS/117/MUL : ANNUAL REPORT 1988**

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## **INTRODUCTION**

The major project of BOBP during 1988 was "Small-Scale Fisherfolk Communities" – GCP/RAS/118/MUL – funded by DANIDA and SIDA. Its initial duration is 5 years (1987-91) and the budget is US \$8 million. The project is supplemented by cash contributions of about US \$500,000 from the participating governments (Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, Thailand). This contribution is primarily intended for the Information Service of the Programme; for administrative purposes it is treated as a separate project, GCP/RAS/117/MUL.

A project for Post-Yarvest Fisheries funded and executed by the ODA of UK under the BOBP umbrella commenced mid-87. A new FAO Trust Fund project for training activities within the scope of GCP/RAS/118/MUL was granted in 1988 by the Arab Gulf Fund for United Nations Organizations (AGFUND). Some national FAO projects and one IMO project in the participating countries are also implemented through the BOBP. These regional and national projects are reported on separately.

An overall picture of the status of the Programme is given in document IOFC:DM/BB/89/3 ("The Bay of Bengal Programme (BOBP) – Progress Report 1987/88" of the 6th Session the IOFC Committee for Development and Management of Fisheries in the Bay of Bengal). The report that follows summarises and comments on the work undertaken during 1988 under GCP/RAS/118/MUL and GCP/RAS/117/MUL only but reference is made to major cross disciplinary cooperation with the other projects.

This report contains a narrative summary for each discipline (Extension, Brackishwater Culture, Fishing Technology, Fishery Resources, Development Support, Information Service) which highlights the year's work, problems and issues and future plans. Under the disciplines, subprojects are presented in status reports that summarize the background, set targets, actual achievements and future targets. The objectives of each subproject and their link with the overall project objectives are also noted in these reports. This format of reporting is based on the recommendations made in the 12th Advisory Committee meeting.

## **EXTENSION**

The highlights of the 1988 work programme in Extension are continuance of the integrated fisheries extension subproject in Ranong, Thailand; initiation of projects in Sri Lanka (fisherfolk credit and fisherfolk radio), and in Indonesia (increasing fisher-folk incomes); and, preparation of a new subproject in the Maldives (developing fisheries extension). The Extension unit also helped the technical BOBP units with inputs concerning socio-economics and people's participation. Attempts were also made to initiate a subproject in India to amplify extension efforts through NGOs but without much success so far. The planned Fisheries Extension Development (through training and demonstration in Bangladesh) was not started pending formal Government clearance of BOBP's work programme. This is a matter of serious concern as only three years are left in this phase of the project.

A central concept that runs through almost all the extension activities is that the subprojects attempt to address people's needs in fisher-folk communities.

This means first ascertaining people's needs, concerns, aspirations and priorities. Such participatory efforts tend to be time-consuming. It also means that the projects, to a certain degree, have to be open ended with the objectives and targets being determined online. In Indonesia, for instance, where the initial indications were for credit activities, preliminary studies changed the focus away from credit to enabling enterprise management capability in fisher-folk so they would go beyond their present situation of informal credit and demand institutional credit.

Addressing people's needs goes beyond being time-consuming and open ended. It raises the problem of addressing non-fishery problems, which seem often to be even more important than fishery concerns. Some extension projects, more often than not, tend to look like rural development activities rather than fishery extension efforts. This requires the fisheries departments either to

be catalytic agents cooperating with other government departments or to evolve into general fisher-folk development agencies. Government management cultures do not seem to encourage such changes.

From 1989, with most of the preparatory and initiation work over, extension efforts will move increasingly into action to try to answer fisher-folk community needs through a wide variety of options all the way from information to infrastructural development, from credit to management training, from fishing technology to participative resource management. All these will be learning experiences, raising important questions on what needs to address, on how to address them. It is also planned to review existing fisheries extension efforts and also to learn from extension work among other communities in the hope of evolving extension approaches suited to fisheries and fisher-folk. Learning for the future rather than benefits for the present: that may well sum up likely outputs in extension.

Details of the status of the subprojects and of targets for 1988 and the future are given in the sub-project descriptions that follow.

<i>Subproject</i>	<i>General Set-vices (EXT/GEN)</i>
<b>Targets 1988</b>	<b>Achievements</b>
Identification/preparation of a subproject in the Maldives	Done. See separate subproject description.
Support to establish a network of NGOs associated with fisher-folk development in Sri Lanka.	Fisher-folk NGOs in Sri Lanka have organized themselves into a collective/network and have had discussions with MinFish and BOBP. They intended to approach BOBP through MinFish for support. However, some differences have surfaced within the collective and delayed activities. No further BOBP inputs envisaged.
Development & testing of methods, techniques & strategies for people's participation (PEP). In particular a working manual on PEP in project implementation	Using participatory methods and rapid rural assessments in activities, particularly in project formulation and planning, has helped refine the techniques. More importantly, it has shown up the problems and limitations of these approaches. A first draft of a manual has been prepared and is being discussed internally.
Small-scale marine fisherfolk consultation in Tamil Nadu to exchange views and learn about fisherfolk needs, perceptions and aspirations	44 fishermen and women from the coastal districts of Tamil Nadu met at a 3-day encounter. The fisherfolk were excited at the opportunity of being listened to rather than talked to and raised several issues and concerns. Resources (or the lack of it) led all other concerns and fisher-folk suggested several management options. Fisherfolk wanted follow-up of issues raised and district level discussions. DOF, TN have distributed the proceedings widely in Tamil and English. See <i>Bay of Bengal News No 31</i>
Support to other subprojects	Done in the case of Kattumaram fisheries in India (RES/KAT/IND) but not for the sub-projects concerning Set Bagnet Fisheries (RES/SBN/BGD) and Fish and Prawn Seed (BWC/FPS/BGD) in Bangladesh due to the postponed implementation. Support has also been given to the Prawn Seed Supply activities in West Bengal (BWC/PSS/IND) with regard to socio-economic survey of prawn seed collector communities.
Unplanned	At the request of women fish vendors from a fishing community in the outskirts of Madras, assistance has been provided to the women to help them in analysing the feasibility of a fish market and to organise themselves to run it. The Corporation of Madras has offered to find land and build the market and lease it to the women who are being organized into a coop. by the DOF who will support and monitor the effort. See <i>Bay of Bengal News No 29</i> for background information.

## Targets 1989

Completion of manual/guidelines for participative project identification, planning and implementation.

Review of fisheries extension approaches in BOBP countries and organization of a regional consultation on the subject.

### *Internal BOBP cooperation*

- Prawn Seed Supply (BWC/PSS/IND)
- Fish and Prawn Seed (BWC/FPS/BGD)
- Oyster Culture (BWC/OYS/MAL)
- Beachlanding Craft Introduction (FIT/BCI/IND)
- Outrigger Canoes (FIT/ORC/INS)
- Set Bagnet Fisheries (RES/SBN/BGD)
- Kattumaram Fisheries (RES/KAT/IND)

## Future

*Ad hoc* services and support to other projects will continue throughout the project.

### Sobproject

### Fisheries Extension Services, Maldives (EXT/FES/MDV)

#### Objective

Establishment of a fisheries extension unit in the Ministry of Fisheries and training its staff.

The Unit will help fisherfolk communities to increase their earnings and improve their quality of life, through (a) training and demonstration of new and improved technologies in fishing, post harvest technology and other development (b) facilitating infrastructural development and (c) improving communication and organisation of fisherfolk by establishing a network of "link fishermen". The targets of the subproject are fisherfolk communities in the Meemu, Vaavu and Faafu atolls. MinFish envisages a countrywide expansion in due course.

#### Status 1987

Not applicable

## Targets 1988

An extension subproject should be prepared and implemented for the Maldives

## Achievements

On the basis of the inputs of an international consultant and subsequent visits and discussions of BOBP staff a proposal for a fisheries extension service has been formulated and presented to the government.

Manual hauling devices for boats were developed (See report of activity under FIT/MHD/MDV).

## Assessment

The subproject is ready to begin work.

## Targets 1989

Staffing of Extension Unit (4 officers), supply of equipment and logistic support.

Officers' training in extension, project planning, management and people's participation.

Network of "link fishermen" in important fishing Islands to aid communication with, and organisation of, fisherfolk.

Demonstration of manual boat hauling devices.

Identification of other infrastructural needs in important fishing islands.



Inventory of potential trainers in fisheries and fisherfolk development and identification of their training needs.

**Future**

Training of Trainers

“Link fishermen” trained in participatory development, community organisation, communication.

Provision of infrastructural facilities in important fishing islands through the catalytic role of the Extension unit.

Plansiprogrammes for expansion of extension services to the whole country on the basis of evaluation of the subproject.

Methods, training tmaterials and media to enable extension and fisherfolk development.

<i>Subproject</i>	<i>Fisherfolk Radio, Sri Lanka (EXT/RDO/SRL)</i>
Objective	Introduction of a radio programme as a communication and extension tool to help fisher-folk in their development. The programming is aimed at small and artisanal fisherfolk beginning with the pilot area of the south-west coast from Matara to Puttalam. The programme will provide local-specific weather forecasts crucial to safety at sea; fish price information, which may improve the bargaining power of fisherfolk; extension and technical information; emergency news flashes; and entertainment. It is hoped that the radio programme, through participative programming, will give fisherfolk a voice.
Status 1987	A subproject outline had been agreed upon with the Ministry of Fisheries and Sri Lanka Broadcasting Corporation (SLBC).
<b>Targets 1988</b>	<b>Achievements</b>
Undertake audience profile studies	Done. Fisherfolk needs and interests, programme content, presentation modes and timings, and fisherfolk willingness to participate have been determined.
Development of programme strategy	Done by a national consultant from SLBC based on the audience studies and Sri Lanka’s experience in developmental community radio.
Training of MinFish staff in Radio Production/Broadcasting	10 MinFish Training staff were trained by SLBC’s training division. Training included hands-on studio and field production exercises.
Establishment of Radio Programme Unit in MinFish	Of the 10 staff trained, 5 were appointed to the RPU under an experienced broadcaster who was hired as Team Leader.
Organize weather forecast Inputs	Arrangements have been made with SLBC and the Sri Lankan Met. Dept. for daily feed of local-specific weather forecast.
Development of market information network	Network has not been formed. Intention is to broadcast wholesale/retail prices in Colombo (St John’s) and allow fisherfolk feedback to guide further development.
Production of sample programmes and field testing	Sample programming and field testing have been in progress since October.
Unplanned	Establishment of a high-level steering group to guide the RPU and protect its independence in programming.

## Assessment

The project is on schedule but vehicle and radio equipment are yet to be delivered. Cooperation from SLBC and MinFish has been very good and the RPU staff selected from MinFish staff have turned out to be a talented and creative group with potential.

## Targets 1989

Regular broadcasts aimed at the pilot area of the southwest coast from Puttalam to Galle.

Evaluation of audience responses and adjustment of programmes as appropriate.

Evaluation of the fisherfolk radio programme by an international consultant to suggest midcourse corrections and further training requirements for MinFish RPU staff.

Phasing in of commercial programme sponsorship

## Future

Radio programming for fisherfolk in Tamil-speaking areas.

All-island fisherfolk radio programming.

Sponsorship of the radio programme to enable MinFish take over programming responsibility.

<i>Subproject</i>	<i>Fisherfolk Credit, Sri Lanka (EXT/ FFC/ SRL)</i>
Objective	<p>Introduction of a non-subsidised credit scheme under the banks' normal lending programmes for small-scale fishery, fishery-related activities as well as other economic activities in order to increase the incomes of fisherfolk and their families.</p> <p>The target of the subproject is small-scale fisherfolk, particularly owner/operators of small crafts, labourers and women from communities in the districts of Puttalam, Galle and Matara. Several marine fisheries investment schemes with and without subsidies have been and are being implemented in Sri Lanka but there are no institutional credit schemes that address the particular needs of small-scale fisherfolk, including fishery-related and non-fishery activities of the womenfolk.</p>
Status 1987	<p>A project proposal prepared with the assistance of a credit consultant in June 1987 was being considered by banks.</p>
<b>Targets 1988</b>	<b>Achievements</b>
Inventory/census of fishing and fisheries related and non-fisheries economic activities	<p>Inventory/census designed and initiated in the districts of Puttalam, Galle and Matara. Pilot testing of questionnaires completed and final questionnaires ready. Field work stopped at this stage due to the disturbed situation in the target areas.</p>
Training of bank staff, MinFish field staff and women NGO staff to undertake studies	<p>In August/September a training programme was held for 49 MinFish staff, 29 bank staff and 4 women staff of the Women's Bureau to prepare them for the inventory/census.</p>
Market constraints analysis	<p>Not yet undertaken. Will follow inventory census.</p>
Scope of rural credit and savings clubs in fishing villages	<p>Not undertaken. The participating banks do not consider this study as being very crucial, but may consider it at a later stage.</p>
Costs/earnings analysis of economic activities of fisherfolk and assessment of credit needs and of deposit potential	<p>Not yet undertaken. Will follow inventory census. But preparations have begun and efforts are on way to design the curriculum, design the study and to develop materials for use in the training.</p>

## Assessment

The subproject was delayed by almost six months pending banks' commitments for participation in the initial phases which attempt to evolve a viable scheme. Bank participation in the implementation will depend on the outcome of the preparatory phases. A further delay of about six months is expected due to the disturbances in the country.

### Targets 1989

Inventory of socio economic data of fisherfolk communities.

Costs and earnings analysis of fisheries, fisheries-related and non- fisheries economic activities of coastal fisherfolk.

MinFish and bank staff trained in :

technical, operational and socio-economic aspects of activities of coastal fisherfolk.

--- economic and financial analysis of enterprises.

modern techniques of rural banking and their application to small-scale fisheries.

Study of successful credit schemes abroad by selected MinFish and bank staff.

### Future

Credit flow strategy, banking plan and monitoring mechanism.

Loan disbursement and deposit mobilization

<i>Subproject</i>	<i>Extension Support through NGOs, India (EXT/NGO/IND)</i>
Objective	<p>Strengthened extension efforts to fisherfolk communities through training of, technology transfer to, and support for extension schemes of non-governmental organisations working with fisherfolk. The ultimate targets of this activity are small and artisanal fisherfolk in selected locations along the east coast of India <i>through</i> the more immediate targets, non-governmental and voluntary groups working with and for fisherfolk.</p> <p>Fisherfolk extension services are hit not only by manpower and financial constraints but also by inadequate training in social and community development and the inability of fisheries departments to address the non-technical concerns and needs of communities. Given the GOI's interest in spreading development inputs through NGOs, it is hoped not only to increase extension throughout but also familiarize DOFs to the concept, enabling them to directly support NGOs in a process that will benefit fisherfolk.</p>
Status 1987	<p>An inventory of fisherfolk NGOs in India (east coast) was compiled and some initial discussions held with NGOs and DOFs.</p>
<b>Targets 1988</b> With selected NGOs, identification of specific training needs in technical and extension areas and technology transfer needs	<b>Achievements</b> In discussions during visits by a multi-disciplinary BOBP team with three NGOs each in Andhra Pradesh and Tamil Nadu, some areas were identified for training needs. They were predominantly in the field of post-harvest technology (marketing, ice plants, drying containers) and extension (non-formal education training in socio economics and survey methods, credit schemes) and to a lesser extent in fishing technology (gear, motorization, beach hauling, offshore fishing) and aquaculture (shrimp farming).

Start of training and demonstration activities Not yet undertaken

#### Assessment

NGO abilities to carry extension to fisherfolk appear to have been overestimated: a few NGOs are definitely capable, particularly people's organizations, but most NGOs have little or no experience of fisheries and fisherfolk. The first category know what they want to improve their extension – some training but mostly technical inputs and support. The latter would need awareness building and considerable training in fisheries and fisherfolk communities before they can become channels of extension. A further concern is that NGOs seem more comfortable in a funding implementation relationship than a relationship based on cooperation, and this will need some effort to evolve.

DOFs are still not convinced about using and working with NGOs as they have yet to evolve procedures and methods of doing so. While conceptually the idea of using and promoting NGO involvement to strengthen extension to fisherfolk has merit, there may be considerable work to be done before it can become a reality.

#### Targets 1989

Identify specific fisheries extension training needs and technology transfer needs for selected NGOs in West Bengal and Orissa.

Sensitize senior staff of selected NGOs to technical and economic aspects of small-scale fisheries by bringing them together in a workshop.

Development of a training package for NGO field personnel together with the senior NGO staff.

Direct support in training and technology development to NGOs in areas already identified.

#### Future

Implementation of training programmes for NGO field personnel.

Evaluation of the feasibility of NGOs enhancing and amplifying extension services to fisherfolk as a supplement to DOF efforts.

Enabling appropriate funding of fisherfolk NGO extension efforts through discussions with government and donor agencies.

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#### Subproject

*Fisheries Extension Development, Bangladesh (EXT/FED/BGD)*

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#### Objective

Demonstration of extension support to fisherfolk communities through training, technology transfer and support of pilot extension schemes.

The immediate targets are the fisherfolk communities of Patuakhali and Barguna districts of Bangladesh. The coastal fisherfolk have little or no extension services because marine fisheries have had low priority in fresh water predominant Bangladesh. The subproject hopes to demonstrate that a trained cadre of DOF extension and NGOs staff with some logistic and financial support and functioning in a participative manner, can address the needs and problems of fisher-folk communities.

#### Status 1987

Discussions with DOF had resulted in broad agreement on the scope of the subproject.

#### Targets 1988

#### Achievements

Except for some preparatory field visits to the project locations by BOBP staff no activity was undertaken as BOBP subprojects in Bangladesh are still awaiting appropriate government clearances.

## Assessment

It is of concern that another year has been lost leaving only three years to undertake the demonstration of extension activity. This may result not only in reduced benefits to the target communities during the stipulated project duration but also to reduced learning from the process because it will not be possible to follow the project through its entire gestation.

## Targets 1989

Logistic support to DOF staff in Barguna and Patuakhali through provision of vehicles and boats. DOF field and HQs staff and personnel of selected NGOs trained to undertake socio-economic surveys and needs analysis.

Understanding of fisheries, socio-economic, occupational and community aspects of coastal fisherfolk through studies in selected villages by DFOs and NGO staff.

Training of DOF staff and NGO personnel in participatory project identification, planning and implementation and in technical aspects of fisheries as required.

At least one extension activity designed and planned for each Uppazila

## Future

Implementation of extension activities

Methods, training materials and media for improved extension services to coastal small-scale fisherfolk.

## Subproject

*Extension Services for Small-Scale Fisheries in Ranong, Thailand (EXT/ESR/THA)*

## Objective

Development and testing of a model for an improved extension service to enable integrated fisheries and fisherfolk development.

The subproject is aimed at small and artisanal fisherfolk in the province of Ranong, Thailand.

It will generate improved knowledge on the problems, needs and aspirations of fisherfolk, identify the means and services to satisfy these needs and aspirations. It will identify specific fishery and fishery-related activities which would lead to improved incomes amongst fisherfolk. It is hoped that the subproject would serve as a model for integrated fisheries and fisherfolk extension services in other coastal provinces.

## Status 1987

55 coastal villages surveyed for infrastructure, services, occupations, problems and credit needs. Costs and earnings study conducted of all common fishing methods. Technology adaptation, trials and demonstration activities initiated and in progress for new collapsible crab traps and oyster culture. Several new activities identified to be taken up in 1988.

## Targets 1988

Analysis of costs and earnings and credit needs; formulation and initiation of loan schemes as appropriate

## Achievements

The studies provided information on the relative economic performance of different fishing activities. They indicated a need for credit but it was not clear how it should be met or whether institutional credit could meet the need. Further detailed investigations and discussions with fisherfolk in these selected villages resulted in loan proposals for cage culture in one village and for renewal of fishing gear in another village; the third decided against any credit. The proposals have been submitted to banks, but the problem of collateral is not solved.

**Analysis of village survey data; identification and initiation of group activities among men and women with the help of CD officers.**

Four groups of women in 4 villages were given training during three sessions over the year on nutrition and cooking.

A problem census was done in three selected villages to help the community identify and analyse their problems, select some for action and organize to act. In cooperation with the departments for Community Development, Health and Non-Formal Education, pilot schemes for education, enterprise development and health have been prepared.

**Further training and demonstration of crab traps in two batches of fishermen**

The new crab traps are not being used. While studies are being undertaken to ascertain the reasons of failure and where it can succeed, it has been decided not to promote the technology but only make it available on demand.

**Collection of oyster spats and start of culture**

The collection of spats in large numbers failed in all three locations. In order not to lose momentum it was decided to buy spats in the open market. The grow out was seriously affected by low salinity during the monsoon in some places. The growth is very good in some other places. The cost of spats and the cohesiveness of the groups seem to be the crucial factors that would determine the success of this activity.

**Demonstration and trials of crab fattening**

Fishermen were taken for a field visit to observe the practice of crab fattening in Surat Thani. 10 fisher-folk have agreed to participate in trials, have been trained, have formed a group and were waiting for the rains to end to start pond digging towards the end of the year.

**Demonstration and trials of squid traps**

No need, since initial investigations found squid traps usage already rapidly spreading in the area. A workshop was held with the fishermen to discuss the fishery and to raise conservation and management issues. Fisher-folk wanted training and help in preventing trawlers from damaging their traps.

**Evaluation of cage culture potential and start of trials if appropriate**

Fish cage culture of groupers is spreading fast all over the target area, raising concerns about the capture of juveniles for stocking and capture of trash fish. There is no need to promote this technology. A workshop was held with fish farmers to help them with disease management.

Shrimp cage culture was found to have potential in some locations and preparations have begun for training and demonstration of the activity.

**Evaluation of progress and direction of the subproject**

A three-person evaluation team studied the project and recommended the continuation of the subproject with more emphasis on extension methodology and socio-economic aspects. See also *Bay of Bengal News No 30*.

#### **Assessment**

The subproject is moving towards its objective; the performance in the technical areas is good but more emphasis is needed on the socio-economic and extension methodology aspects. More efforts should also go into developing cooperation with other agencies to provide integrated inputs to fisher-folk.

## Targets 1989

Credit schemes functioning in at least two villages.

Understanding of fisherfolk needs, concerns and aspirations and of community dynamics through participatory studies and dialogues in selected communities.

Establishment of social services in non-formal education, enterprise development and health in three villages in cooperation with NFC, CDD and Health departments.

Assessment of culture viability by harvesting and marketing oysters from the initial grow-out trials.

Assessment of feasibility of crab fattening by trials in selected villages.

Assessment of feasibility of shrimp cage culture by trials in selected villages.

Introduction of fishery resources management aspects in interactions with fisher-folk concerned with e.g. fish cage culture, squid fishing, etc.

Understanding of the failure of the crab traps.

Project staff, PFO, CDD, NFC and health department staff trained in extension methodology and technical aspects of project activity.

Study of other extension projects abroad by selected project staff.

## Future

Similar work is envisaged to continue throughout the project period.

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<i>Subproject</i>	<i>Improved Earnings of Small-Scale Coastal Fisher-folk, Indonesia (EXT/IEF/INS)</i>
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Objective	The objectives, both in qualitative and quantitative terms, were to be formulated on-line through studies in a participative manner. While it had been felt that demonstration of an institutional credit system may be important, preliminary studies led to a shift in the focus to improve the managerial capacity of fisherfolk with emphasis on group action. It was believed that this would enable fisherfolk to improve the economic performance of existing and new enterprises.
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The target of the subproject, the small-scale fisherfolk of Langkat district, face a resource-scarce situation where the inshores are being exploited close to or above their limits. This leaves offshore and onshore fish culture, fish processing and nonfishing activities as options. Selection of viable and sustainable enterprises and better management would enable fisher-folk to increase their earnings.

Status 1987	Project office set up; briefing and orientation training of staff completed; preliminary studies planned; training workshops held in survey methods; surveys initiated in the target area.
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## Targets 1988

Collection of basic data on fisher-folk communities, on activities of fisher-folk and understanding community dynamics

Collection of detailed data on economics of remunerative activities among fisherfolk

## Achievements

34 coastal fisherfolk communities of Langkat were studied in a participative manner resulting in village profiles, needs and lists of and some basic information regarding the economic activities of fisherfolk.

Samples of economic enterprises practised by fisherfolk were studied to obtain more information on the organization of enterprises, the problems encountered and the potential for further development.

Preparation of credit scheme not undertaken. The preliminary studies had indicated that : the existing informal marketing/credit system seems to meet the credit needs of the fisherfolk; the existing system, with its social links, may constrain and affect the viability of an institutional credit system. The existing system, further studied by a consultant, offers an efficient service, but the fisherfolk would probably be better off with increased bargaining power through group action. See further Bay of Bengal News No 30.

Preparation of other activities identified during preliminary enquiries

Small-enterprise consultants undertook participatory planning exercises in three villages and their findings suggest that it would be worthwhile to help fisherfolk, organized into groups, to better use their resources and venture into new enterprises through proper appraisal and management. Some options of existing and new enterprises have been identified and a plan of action in pilot form to implement enterprise development has been prepared.

### **Assessment**

The initial enquiries took longer than anticipated and highlighted the need for more training inputs to fisheries and extension staff which had not been included among the targets. The subproject is now embarking on group mobilization to enable fisherfolk to collectively help themselves. This is a long process. The consultants have set a time horizon of four years; and this process has just begun. Given the fact that the subproject has only three years to go this aspect needs serious consideration.

### **Targets 1989**

Groups of fisherfolk formed in three villages for self-help and for the establishment, management and operation of small-enterprises.

Establishment of a few viable small-enterprises managed and operated by fisherfolk, individually or in groups in the villages.

Fisherfolk group members trained in improved management of small-enterprises.

Study of other extension projects abroad by selected project staff.

### **Future**

Methods, training materials and media by which improved management of small-enterprises are demonstrated.

Fisheries and extension services staff trained in methods and media for demonstrating and enabling management of fisher-folk enterprises.

Continued support to the fisherfolk group and their enterprises.

Replication of extension methodology in other selected locations.

### **BRACKISHWATER CULTURE**

Besides some miscellaneous brackishwater activities the work programme consisted of six subprojects : Pen Culture of Prawns in Sri Lanka; Seaweed Farming in India and Sri Lanka; Supply of Prawn Seed in West Bengal; Fish and Prawn Seed in Bangladesh and Oyster Culture in Malaysia. The subprojects for pen culture, seaweed and oyster have been in full swing during the year while prawn seed activities in West Bengal have been of a preparatory nature; the fish and prawn seed subproject in Bangladesh has not yet started. The highlights of work are :

- The pen culture trials in Sri Lanka failed to prove the economic viability of the technology and the subproject is being terminated.



- No seaweed production targets have been achieved in Mandapam due to technical problems with spore setting, slow growth and grazing. It has been difficult to maintain sufficient interest among the participating villagers to continue the work.
- The progress of seaweed culture trials in Sri Lanka has been poor.
- In Malaysia a couple of good sources of oyster spat have been found but how commercial quantities can be collected has still not been established. Oyster market studies indicate undersupplied markets and potential demand for cultured oyster. DOF staff and a potential oyster farmer have received valuable training in oyster culture.

The development of brackishwater culture aimed at the rural poor is confronted by environmental, biological and social problems which require considerable time to resolve. Seasonal variations in the physical and biological environment are perhaps the most difficult. Efficient collection of seed stock requires a detailed knowledge of seasonal and spatial variations in abundance which is often not available over wide geographic areas. If for some reasons, the periods of availability – often very brief – are missed, at least a year's delay may result. Other problems, such as grazing of seaweed or the growth of the seaweed may vary in such a way that several culture cycles extending over more than one year may be required to understand their effects on production, and fisherfolk are understandably reluctant to spend time on a project whose outcome is uncertain. Poaching and vandalism are universal problems for aquaculturists, and BOBP subprojects have been no exception. Such actions are often evidence of space allocation problems among competitors for limited inshore water areas. Open water pen culture of shrimp and finfish and seaweed farming are heavily impacted by such competition. The full involvement of local communities is an absolute must if the allocation issue is to have any hope of resolution.

It is hoped that all subprojects will be fully operational during 1989 but it should be noted that some components, such as hatchery development, are subject to the outcome of feasibility studies. The seaweed work in Mandapam should produce some conclusive results about the potential for seaweed culture. It is planned to organize a regional workshop to discuss these results and those attained by other projects in other BOBP countries. A major effort will be made to get the seed subprojects going in Bangladesh and West Bengal by utilizing consultancy services from countries in the region having the required experience. In Malaysia the collection and purchase of spats will continue to enable an assessment of its availability for commercial culture. Some initial results of grow-out trials and test marketing are also anticipated. In all the subprojects, work on monitoring of economic variables and preliminary economic analysis will be conspicuous.

<i>Subproject</i>	<i>General Services (BWC/GEN)</i>
<b>Targets 1988</b>	<b>Achievements</b>
Technical assessment of <i>Artemia</i> culture potential in Tamil Nadu and Andhra Pradesh salterns.	An expert consultant was contacted and after agreeing to the assignment, dropped out just before the consultancy was to have started. Due to the highly seasonal nature of salt production, the activity, including the planned workshop, had to be postponed by one year.
Report to SIDA with recommendations for further action on silvipisciculture	Project staff participated in a project review of the SIDA funded silvipisciculture project in West Bengal. Report completed with recommendations for training of Forestry Department staff by an expert consultant during a full culture season and implementation of structural improvements of bunds and sluice gates.
Establish a mechanism by which BOBP can continue to provide inputs to the silvi-pisciculture project	Failed. The termination of SIDA funding support to the West Bengal Forestry Department project ended BOBP's role.
Support to other such projects	Provided for the extension subproject in Ranong (EXT/ESR/THA) in the field of oyster culture.
<b>Targets 1989</b>	
A technical assessment of <i>Artemia</i> culture potential in Tamil Nadu and Andhra Pradesh salterns.	

Project proposal for Artemia culture pilot project.

Internal BOBP cooperation.

- Support to and training of NGOs (EXT/NGO/IND)
- Extension Services in Ranong (EXT/ESR/THA)

Future

General services to continue throughout the project.

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<i>Subproject</i>	<i>Pen Culture of prawns, Sri Lanka (BWC/PEN/SRL)</i>
<b>Objective</b>	<b>Assessment of the technical, economic and social feasibility of prawn culture in pens in coastal lagoons on a small household basis.</b>  The target group are small-scale fishermen exploiting the coastal lagoons of Sri Lanka.
<b>Status 1987</b>	Pen culture trials were being carried out in Chilaw, north of Colombo. Two rearing cycles had been completed and a third was under way; the first failed due to stock loss; production data was obtained from the second harvest, Nursery rearing practices were defined and led to high juvenile survival. Decision to assist the local fisherman's organization to undertake culture trials.
<b>Targets 1989</b>	<b>Achievements</b>
Completion of 9 months of trials based on a partial harvest/restocking procedure	Heavy rains during the normally dry season resulted in large salinity fluctuations. Pest, net pen wall quality and vandalism were other major problems. Growth was poor and forced prolongation of the trial period till December. Recovery was poor.
Construction and operation of two new 0.25 ha pens by SDO (local organization) nominees	The pens were completed by early April and culture operations undertaken. A new Netlon material used performed well but otherwise results were poor for the same reasons as above.
Evaluation of economic potential	The good result obtained once during 1987 could not be replicated. Income from the pens during the last two years does not even, by far, cover the operation costs. The culture of prawns in pens was not economically viable.
Evaluation of training, of demonstration and of credit needs.	In view of the above there is no need for training, demonstration and credit, hence no action was taken.
Identify and train interested persons in the subproject area	No action taken because the technology seems not economically viable.

#### **Assessment**

It is proved that pen culture technology may be successfully transferred to local fishermen but the technology did not prove economically feasible. Pest control and the quality of the penwall material are problems which might perhaps yet be solved satisfactorily. However, successful pen culture of prawns would then still be dependent on an unwarranted assumption; a predictable salinity regime to allow planning of the culture operations. Pens are also relatively fragile : this makes vandalism particularly crippling. It is therefore concluded that prawn culture in pens is not a suitable technology to be recommended for any large-scale introduction. It may however sometimes succeed under a combination of favourable circumstances. From nursery and grow-out trials in 1988 it seems that the partial harvest with replacement method is not suitable for pen culture. The subproject will be terminated and reported on.

<i>Subproject</i>	<i>Seaweed (Gracilaria) Farming, Sri Lanka (BWC/SWD/SRL)</i>
Objective	Assessment and demonstration of the technical economic and social viability of small-scale seaweed culture through community participation among the fisherfolk exploiting the Puttalam lagoon.
Status 1987	The subproject would consist of two components. Commercial seaweed farming trials would be organized by the Sarvodaya Shramadana Sangamaya Inc. (a NGO) and an applied research component would be implemented by NARA. Villages for participation and sites for facilities had been identified.
<b>Targets 1989</b>	<b>Achievements</b>
Construction of pilot farms and applied research installation	Spore-setting facilities for NARA and Sarvodaya were completed by May. One pilot farm and one experimental module were constructed and seeded with both vegetative cuttings and spore-setlines.
Training of staff in spore setting and outplanting technology	Training programs were conducted by an expert consultant during spore setting and grow-out trials.
One commercial harvest of seaweed	Not achieved.
Start of applied research activities (by NARA)	Spore-setting and outplanting experiments started in May but efforts have been sporadic.
An export market study (by the ODA project)	Postponed, pending outcome of an INFOFISH study of a similar nature.
A study tour for national staff	Postponed because of technical development problems in the intended host country.
Initiate surveys of wild seaweed stocks (by NARA)	Some field sampling was started but has been insignificant.
<b>Assessment</b>	Culture trials have gone very poorly and there are no results to report for 1988. The spore-setting was not successful and grazing was a serious problem. For most of the year it has proven difficult for the NGO to motivate participating villagers to the required level of involvement. NARA has not been able to implement and monitor its culture trials on a sufficiently regular basis. Some of these problems appeared to be alleviating during November and December.
<b>Targets 1989</b>	<p>Completion of one year's spore-setting trials by NARA and Sarvodaya and evaluation of the technology.</p> <p>Vegetative propagation of farm modules by shramadanas in two participating villages.</p> <p>Assessment of grazing control methods including net fencing and fish traps.</p> <p>Partial harvesting and test marketing as production permits.</p> <p>Research to identify environmental factors affecting spore-setting and vegetative growth (by NARA).</p> <p>Field sampling of wild stocks of commercially important seaweeds along the west coast (by NARA).</p> <p>Co-operation with the ODA project in handling, storing, processing and marketing.</p> <p>Regional Gracilaria workshop in cooperation with ODA and AGFUND projects.</p>
<b>Future</b>	<p>Demonstration and extension programmes depending on the outcome of the ongoing trials.</p> <p>Completion of the research component (NARA).</p>

<i>Subproject</i>	<i>Seaweed (Gracilaria) farming, India (BWC/SWD/IND)</i>
Objective	Assessment and demonstration of the technical, economic and social viability of small-scale seaweed culture through community participation among fisher-folk of coastal villages of Ramnad district, Tamil Nadu, with a tradition of seaweed collection.
Status 1987	<p>Seaweed farming trials with strong target group participation initiated in two villages – Vedalai and Chinnapalam. Seaweed farmer committees set up to manage the activities. One spore-setting shed was set up and put into operation in Vedalai; spore-setting trials were under way on a regular basis, in both Vedalai and Chinnapalam.</p> <p>A total of 45 farm modules had been set up; outplanting trials with both spores and vegetative cuttings were under way. The participating villagers were trained on the job in the basics of <i>Gracilaria</i> culture.</p>
<b>Targets 1988</b>	<b>Achievements</b>
Continued development and reinforcement of People's Participation in technical trials	Technical trials were ongoing throughout 1988. A total of 45 villagers and their relatives participated in seaweed culture activities. But the seaweed farmers committees have not functioned effectively as a monitoring mechanism.
Complete seeding of the pilot farms	Seeding by spore-setting in tanks has not succeeded despite repeated attempts and expert advice. Outplanting is instead being done of vegetative cuttings attached to ropes.
Start of partial harvesting	Heavy grazing and poor results from spore-setting technology delayed harvesting until the fourth quarter. Harvest amounts were quantitatively insignificant but were used for testing product quality.
Improved skills of fisheries (government) staff through a study tour to Thailand and on the job experience	The study tour has been postponed because of technical development problems in the intended host country. An expert consultant provided training in spore-setting and grow-out for two weeks in June.
Study of post harvest processing and marketing	Study undertaken by ODA project; results published in <i>Bay of Bengal News</i> No 31, September 1988
<b>Assessment</b>	
An important technical component of the subproject, spore-setting has not been successful. Vegetative propagation has been taken up as the outplanting method of choice. Grazing by herbivorous fish has proven to be a major constraint; control measures are under evaluation. The use of an on-site "motivator" has proven indispensable in maintaining participants' interest and resolving misunderstanding and disagreements among them.	
<b>Targets 1989</b>	
Evaluation of technical viability of spore-setting.	
Preliminary assessment of the economic viability of seaweed farming.	
Complete outplanting of 45 modules by vegetative cuttings.	

Test marketing through different channels.

Cooperation with the ODA project in handling, storing and processing.

Regional Graclaria workshop in cooperation with ODA and AGFUND projects.

### Future

Subject to outcome of current trials :

Expand seaweed culture to other villages.

– Identify or create and stimulate organizations that can assist farmers with marketing their products.

Prepare audio-visuals and extension manuals in the vernacular for use in extension.

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Subproject	Prawn Seed Supply, India (BWC/PSS/IND)
Objective	<p>Introduction of methods and techniques to increase the supply of prawn seed and the income of seed collectors, and to improve the utilization of by-catches in West Bengal.</p> <p>Landless peasants engaged in shrimp seed collection in the semisalinity zone of West Bengal constitute the primary target group. The increase of seed supply and better utilization of by-catches are of general state interest and are likely to mainly benefit small-scale operators due to the geographical and socio-political conditions in West Bengal.</p>
Status 1987	No activities other than preliminary discussions had taken place.
<b>Targets 1988</b>	<b>Achievements</b>
Identification, preparation and start of a new subproject	<p>A subproject with the above objective was identified and prepared together with the Directorate of Fisheries. It has two components.</p> <p>(a) assistance to prawn seed collectors under which a survey has been undertaken to identify participating villages; an expert consultant has studied the technical aspects and commenced training of staff and collectors; NGOs are being sought as extension agents.</p> <p>(b) introduction of small-scale hatchery technology (from Thailand) for which plans are being worked out.</p>
introduction of an ecologically sustainable system such as silvipisciculture to low income villagers	It seems that it will not be possible to achieve this. The major problem areas are land allocation/ownership, organization and management and the time frame for implementation.
Assessment	
The subproject was slow to start; seasonal factors, mainly the monsoon, severely inhibit field work. There are some serious reservations concerning the transferability of Thai hatchery technology which consultants will evaluate during the first quarter of 1989.	
<b>Targets 1989</b>	
Assessment of composition of by-catches and identification of their potential use in aquaculture. Trained government extension staff and NGO personnel in improved seed catching and nursery rearing.	

Launching of an extension programme for seed collection, transport, nursery rearing.  
 Study tour to Thailand to observe backyard hatchery technology.  
 Economic and technical feasibility study of small-scale penaeid shrimp hatchery technology.  
 One model small-scale penaeid shrimp hatchery to be constructed.

**Future**

Implementation of the extension programme for improved seed catching and nursery rearing.  
 DOF personnel able to operate a small-scale hatchery.

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<i>Subproject</i>	<i>Fish and Prawn Seed, Bangladesh (BWC/FPS/BGD)</i>
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Objective	Introduction of methods and techniques to increase the supply of prawn seed and the income of seed collectors and to improve the utilization of by-catches.  The primary target group are the many landless peasant families engaged in shrimp seed catching in the semisalinea zone. An important secondary concern is the national interest of best utilization of the country's resources.
Status 1987	An understanding of the type and magnitude of the problems of seed collectors had been arrived at through studies in the Cox's Bazaar and Satkhira/Khulna districts in 1986 and 1987.
<b>Targets 1988</b>	<b>Achievements</b> No work was carried out pending the necessary GOB clearance.

**Assessment**

Besides a delayed implementation of about one year, the focus of the subproject has changed from seed collection to hatchery produced freshwater prawn seeds on request from the GOB.

**Targets 1989**

Description and analysis of the market for freshwater prawn fry.  
 Feasibility study of transfer of small-scale hatchery technology from Thailand.  
 Study tour to Thailand.  
 Establishment of one demonstration hatchery.  
 DOF staff trained in hatchery technology.  
 Assessment of the species composition of seed collection.  
 Identification of suitable activities for seed collectors.

**Future**

Training of extension staff, NGO personnel, and private sector operators in freshwater prawn hatchery technology.  
 Design and initiation of an extension programme for nursery rearing of juveniles (freshwater prawns).

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<i>Subproject</i>	<i>Oyster culture, Malaysia (BWC/OYS/MAL)</i>
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Objective	Introduction of small-scale oyster farming as an income generating activity for coastal fisherfolk households of peninsular Malaysia (west coast).
Status 1987	Subproject agreed upon for pilot-scale oyster culture; four field biologists hired; five sites selected for spat collection; marketing study contracted with INFOFISH.

## **Targets 1988**

**Training of field biologists**

**Oyster marketing study**

**Spat collection at Sg.Muar, Sg.Linggi, Palau Pangkoo, P.Jerejak and Pulau Langkawi**

**Study tour to Thailand for FRI staff**

**Unplanned**

**Unplanned**

## **Achievements**

Completed during January and the field biologists were outposted in February.

The INFOFISH study was completed and a supplementary study focussing on local markets was undertaken by BOBP staff. The outcome indicates an undersupplied market. See *Bay of Bengal News No 32*.

Spat collection activities were initiated at all sites. Two additional sites were included in Trengganu. Poor results were obtained at P. Jerejak and Sg. Linggi both of which were dropped. Pulau Langkawi and both sites in Trengganu were positively identified as good spat sources. See *Bay of Bengal News No 30*.

FRI staff, field biologists and extension officers, 12 persons in all, undertook a 10-day tour and observed commercial oyster farming and associated research and development activities. Some of the culture methods observed in Thailand are being tested by field biologists.

Grow-out trials were started in Langkawi with *O.folium*, and in Pangkor and P.Penang with *Crassostrea* sp. transferred from Trengganu. Initial results of the latter were not encouraging due to heavy fouling.

Two research officers of FRI and a private fisherman-cum- potential oyster farmer participated in a NACA training course on commercial oyster culture in Korea for 3 weeks. The private farmer is already making use of his experience in commercial spat collection and grow-out trials.

## **Assessment**

The implementation of field work based on limited production targets proceeded reasonably well; two sites were positively identified as good spat sources. More spat collection sites must be found and it remains to be seen if enough spat can be collected for culture on a commercial scale. Studies indicate an undersupplied oyster market.

## **Targets 1989**

**Sufficient spat for commercial grow-out trials.**

**Grow-out trials at different locations (4) by different methods (4)**

**Preliminary economic analysis of oyster culture methods.**

**Study tour for potential oyster farmers to Thailand.**

**Test marketing.**

**Bacteriological water and product quality sampling.**

## **Future**

**Recommendations for specific grow-out systems and species around mid-1990.**

**Preparation and initiation of a suitable extension programme.**

## FISHING TECHNOLOGY

Most of the effort during 1988 has been devoted to implementation of activities on Fishing Boat Development in Sri Lanka and Beachlanding Craft (BLC) in India and to the preparation of a new subproject for Outrigger Canoes in Indonesia. In addition, manual boat hauling devices have been designed, manufactured, tested and made ready for demonstration in the Maldives. The offshore boat development in Sri Lanka was successfully completed by a one year demonstration of SRL- 15. A slightly larger boat, SRL-34, also included in the demonstration programme drifted/sailed to Indonesia after an engine breakdown. This highlighted the need for better training of fishermen, new safety measures and equipment and improved alertness for search and rescue. The final solution to the overheating problems of engines in the BLC has probably been arrived at by the new water-cooled engine. The trials with new engines required longer time than anticipated and the fishing demonstration in Tamil Nadu therefore had to be postponed till 1989.

Services on a reimbursable basis have been extended to the FAO/TCP projects for Exploratory Tuna Fishing in the Maldives and Sri Lanka. The main input was installation of equipment and training of crew in the Maldives and technical evaluation and follow up recommendations in Sri Lanka. Supporting services for equipment and training of crew were also extended to the FAO/UNDP Reef Fisheries in the Maldives. Finally, the Fishing Technologist participated in an FAO/ADB Fisheries sector study in Sri Lanka. Internally in BOBP, cooperation has been extended to the Kattumaram Fisheries and NGO activities in India. Details of these supporting activities are reported in detail elsewhere.

There are only two activities in the 1988 workplan that were not undertaken. Promotion of a hook and line fishery in the Maldives was found to be premature. In India, further investigation of the feasibility of motorization of Kattumaram was not needed in view of the high thrust from private companies to introduce different types of outboard engines for motorization of country craft.

The 1989 workplan includes Outrigger Canoe activities in Sri Lanka aiming at cost reduction and in Indonesia aiming at production increase. Under the BLC Introduction in India, it is hoped to demonstrate economic viability in Tamil Nadu, provide extensive training, mainly in engine maintenance, and wind up the subproject by impact studies and reporting. Two new production-oriented subprojects are proposed for India, i.e. Flying Fish Fisheries and Large Pelagic Species; both are related to the BLC activities; the latter is largely based on experiences in Sri Lanka. The promotion of Power and Emergency Sails for fishing craft is proposed as a separate subproject. Reimbursable services are foreseen in connection with the new FAO/TCP Fishing Craft Development project in Kerala. Internal cooperation will focus on Fisheries Extension Services in the Maldives and on the Kattumaram and NGO subprojects in India.

<i>Subproject</i>	<i>General Services (FIT/GEN)</i>
<b>Targets 1988</b>	<b>Achievements</b>
Start of sail power demonstration programme	Delayed, pending the recruitment of an APO Sail Specialist; now proposed as a separate subproject for 1989 onwards.
Reimbursable support to other projects	Completed as planned for <ul style="list-style-type: none"> <li>- FAO/ADB sector study, SRL</li> <li>FAO/TCP Exploratory Tuna Fishing, SRL, MDV</li> <li>- FAO/UNDP Reef Fisheries survey MDV Plus</li> <li>- FAO Fisheries project in Tanzania</li> <li>- Internal, BOBP cooperation.</li> <li>- Kattumaram fisheries (RES/KAT/IND)</li> <li>- Extension support through NGOs(EXT/NGO/IND)</li> </ul>
<b>Targets 1989</b>	
Reimbursable support to national projects	
Fishing Craft Development in Kerala, IND	(FAO/TCP)
- Reef Fisheries Survey, MDV	(FAO/UNDP)
Internal BOBP cooperation	
- Fisheries Extension Service	(EXT/FES/MDV)
Kattumaram Fisheries	(RES/KAT/IND)
- Extension through NGOs	(EXT/NGO/IND)
- Project identification/preparation	(DEV/WEB/IND)



## Future

General services and support to other projects will continue throughout the project.

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<i>Subproject</i>	<i>Power and Emergency Sails (FIT/PES)</i>
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<b>Objectives</b>	Demonstration and promotion of suitable sails for different motorized fishing craft to improve fuel economy and safety.
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<b>Status 1988</b>	Over the years, all BOBP prototype boats have been equipped with sails and their use have been promoted during technical trials and fishing operations. A sail consultation was organized (Madras 1983) to establish the qualities of different rigs. A systematic programme of demonstration and training is needed to achieve an impact on fuel saving and safety. A sail specialist (APO) is under recruitment and expected to join early 1989.
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## **Targets 1989**

Establishment of priority areas as to craft and type of rigs.

Identification of suitable channels and means for demonstration, training and promotion.

Preparation of action programme.

## Future

Implementation of demonstration, training and promotional activities for about 2 years.

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<b>Subproject</b>	<i>Manual Boat Hauling Devices Maldives (FIT/MHD/MDV)</i>
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<b>Objective</b>	Development and introduction of manual devices for hauling of fishing craft.
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The fishing craft of Maldives are beached about once a month for treatment of the hull to avoid marine borer attacks. It is done manually and requires about 50 men and women. The operation has become increasingly difficult due to larger hulls, added weight by motorization and fewer people available (other occupations and migration).

<b>Status 1987</b>	introduction of hauling devices for motorized fishing boat was identified as one area for fishing technology development in the Maldives.
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## **Targets 1988**

<b>Preparation and start of a subproject</b>	<b>Achievements</b> Done. Three different types of manual capstan were designed, constructed and tested in Madras; the capstans have been shipped to Male and preparations for demonstration at sites selected by the MinFish have been completed.
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## **Assessment**

It is a relatively simple and straightforward activity and no technical problems are foreseen

If the response from the communities is positive during the forthcoming demonstrations, training of workshop staff should precede further introduction. Project support to this will be dealt with under the Extension subproject in the Maldives.

**Targets 1989 and future : See subproject EXT/FES/MDV**

Objective	<p>Development and demonstration of new alternative craft to the conventional ones to increase earnings of fisher-folk by reducing costs and improving efficiency and comfort of operations.</p> <p>The smaller craft (ORU) are common along the south and southwest coast, are beach-based, fish in the inshore waters and are operated by the crew on share basis, sometimes together with the owner. The operational area of the larger craft could be island-wide with bases at the major landing centres; they fish offshore (35-120 n miles) and are usually operated by a crew on share basis with owner as shore manager.</p>
Status 1987	<p>Two new small offshore boats SRL-15 and SRL-34, with better endurance at sea, longer range of operation, better fuel economy, preservation of fish and improved comfort and safety of crew, which were developed during the past 4-5 years, were undergoing performance monitoring.</p> <p>The demonstration of the beachlanding craft SRL-14 for shallow water use was ongoing. The craft had been demonstrated from beaches in previous years.</p> <p>Two prototype versions of an outrigger canoe, made by strip planking methods as alternatives to dugout canoes, were under construction.</p>
Targets 1988 Completion of one year performance monitoring of SRL-15 and SRL-34	<p><b>Achievements</b></p> <p>Completed for SRL-15 which performed very well. SRL-34 was monitored for six months only, with good performance - since it drifted/sailed to Indonesia after engine trouble.</p>
Approval of SRL-15 and SRL-34 for subsidy scheme	<p>The approval is still pending for SRL-15 but all necessary material has been submitted to the MinFish.</p> <p>The approval of SRL-34 has been granted.</p>
Technical support in construction of the final version of SRL-15 and S R L-34	<p>Was given to the private boatyard which built the first final version of SRL-15 for a private boat owner.</p> <p>Technical support for construction of SRL-34 was not needed.</p> <p>Training to conduct stability tests of small boats was given to technical staff of MinFish.</p>
Propaganda campaign for low fuel consumption, preservation of fish safety, etc.	<p>Due to high cost and doubts about the outcome, the propaganda campaign was not carried out.</p>
Final report on small multi-day offshore craft	<p>Delayed till early 1989</p>
Demonstration of SRL-14 for operation from shallow water inlets.	<p>Was successfully carried out in Chilaw, West Coast of Sri Lanka.</p>
Modification of SRL-14 general arrangement and re-engining in cooperation with private boatyard.	<p>The drawings of the modified general arrangement and for re-engining were prepared. The modification and re-engining works by private boatyards were not carried out. It was concluded that this type of craft has no potential use in Sri Lanka under the present circumstances.</p>

Construction of two outrigger canoes (SRL-18 & SRL-19) and trials and demonstration with fishermen of Doddanduwa	Two outrigger canoes were constructed and tested. The demonstration of SRL-19 was discontinued due to technical problems. The demonstration of SRL-18 is ongoing without serious technical problems. For fuel efficiency and low running cost, a diesel longtail unit (donated by Yanmar) will be tested and compared with outboard kerosene motors now in use.
Technical and economic evaluation of the performance of the outrigger canoes and reporting	Postponed till 1989 due to delay in the construction and to the addition of the longtail unit. The performance is continuously monitored.

### **Assessment**

*The SRL-15* despite her relatively small size, has proven to be feasible for multi-day and multi-purpose *offshore fisheries*. The boat performed very well during commercial fishing and was liked by the boat owner and crew, who cooperated in the demonstration for one year. The owner ordered a new SRL-15 for his own use while the demonstration was ongoing; it was delivered at the end of the year. See *Bay of Bengal News No. 30*.

The small-scale offshore fishery of Sri Lanka has expanded rapidly in recent years. What has lagged behind are the safety aspects. Boat construction standard, safety equipment, training of fishermen in navigation, engine maintenance and safety measures are areas for improvement. See *Bay of Bengal News No. 31*.

The feasibility of *SRL-14* as a *beachlanding* craft or shallow draft craft has been established and demonstrated. However, with the development of multi-day offshore fishing fleet, the scope for this type of craft seems to be limited. The concept of this boat would best apply to selected areas of the east coast where there are long stretches of open beaches without harbour facilities. No further work is envisaged unless the need for demonstrations in those areas arise.

The *outrigger canoe* fishermen of Doddanduwa are convinced about the appropriateness of the new outrigger canoe design for better fuel efficiency and easier fishing operation. However, they still have reservations as to the service life of a plank built-canoe. The high running cost of the outboard kerosene motor is of concern to most of the fisherfolk. There is a need to try alternatives.

### **Targets 1989**

Video film on small-scale offshore fisheries to promote SRL-15 features supplemented by pamphlets and newspaper articles

Recommendations on improved boat construction standard, safety equipment/measures and training of fishermen for improved safety at sea.

Final report on small-offshore boat development.

Information seminars.

Installation and testing of longtail engine in SRL-19.

Demonstration of SRL-19 during the monsoon period.

Performance monitoring of SRL-18 and SRL-19 till the end of the monsoon.

Evaluation of SRL-18 and SRL-19 with recommendation for follow-up.

Reporting on outrigger canoe development.

### **Future**

The remaining work on the offshore boats should be finalised well before the end of 1989 and there wouldn't be any further inputs.

If the trials and demonstrations of canoes lead to positive results, further support should be given to training of carpenters in construction of plank-built canoes and to promotion of such craft.

<i>Objective</i>	Introduction of beachlanding craft to increase incomes of fisherfolk and fish production. The primary target group of this subproject are the fisherfolk who operate from open beaches without access to harbours or sheltered anchorages and who are therefore unable to use conventional craft. New beachlanding craft enable them to increase productivity and to tap resources beyond the range of the traditional craft (mostly kattumaram).
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Status 1987	Since the introduction of beachlanding craft (BLC) in 1986 under various financing schemes, about 150 were in operation in Orissa, Andhra Pradesh, Tamil Nadu, Pondicherry and Kerala. .  There were two types - both in FRP - the IND-20 (deck type) and IND-25 (open type). The BLC were built in five boatyards.  Viability of the BLC had not been established in Tamil Nadu (and Pondicherry) and there were continuous problems with the air-cooled engine.
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<b>Targets 1988</b>	<b>Assessment</b>
Maintenance of quality of construction of BLC	Periodic visits to boatyards for inspection of BLCs has contributed to the maintenance of good standard of construction by the three major boatyards.
Further trials of Kirloskar freshwater-cooled diesel engine and VST reduction gear box till their feasibility is established	The feasibility of the VST freshwater-cooled engine with reduction gear box has been established for IND-20. The Kirloskar engine has been tested but a satisfactory solution is still to be developed by the manufacturer.  In addition an air-cooled Lombardini diesel engine was unsuccessfully tested. Realising the necessity for freshwater cooling for BLC engines the manufacturer has developed a freshwater cooled version yet to be tested.
Training of trainers and fishermen in BLC engine operation and maintenance	Training was conducted in the two fishing centres where water cooled VST engines are being introduced. Training materials have been developed and tested.
Demonstrate viability of BLC in Tamil Nadu	Delayed due to slow progress with the engine trials, hence non-availability of BLC.
Monitoring of performance	Not yet done in a systematic manner due to inadequate efforts, the necessary cooperation from the state directorates has also not been forthcoming.
Assistance to West Bengal to introduce BLC	Provided for specification of craft, ordering and inspection of construction. Demonstrations are yet to be done.
Unplanned	In connection with technical engine trials, the availability of underexploited large flying fish in commercial quantities was identified off Madras using gillnets.

**Assessment**  
The feasibility of BLC has been firmly established. Pointers are the successful operation in centres such as Puri. (See *Bay of Bengal News* No. 30); the increasing number of boats issued under direct purchase schemes; and the many orders being received by the Kakinada boatyard. At the end of the year 210 BLC had been delivered and 70 BLC were in the order books. The success is however still limited to Orissa and Andhra Pradesh.

The engine problems (overheating) appear to have been overcome by the introduction of the freshwater-cooled engine. Of the two types, IND-20 is preferred and in most situations, the most suitable one.

Areas for further improvement are: (a) training in operation and maintenance of engines and (b) diversification of fishing as to gear and area of operation and areas beyond the capacity and range of traditional craft:

**Targets 1989**

Demonstration in West Bengal.

Demonstration of viable BLC operations in Tamil Nadu.

Training of about 10 trainers and 100 fishermen operators of BLC in operation and maintenance of propulsion units.

Study of the socio-economic impact of BLC introduction in Puri.

Impact evaluation and reporting.

**Future 1990**

The objective of the subproject should be fully achieved by the end of 1989. Further support in the field of training and fishing demonstrations may however be desirable.

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*Subproject*

*Flying Fish Fisheries, India (FIT/FFF/IND)*

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*Objective*

**Demonstration of flying fish fishing with gillnets.**

The fisher-folk likely to benefit from the subproject are those operating larger kattumarams, motorized traditional craft, BLC and similar craft. Higher earnings and increased fish production from an underexploited resource would be the end result.

**Status 1988**

Flying fish are traditionally caught seasonally by scoopnet and small gillnet in connection with brushpile aggregation and drift longline from large kattumarams along the Coromandel coast. During fishing trials with BLC from Madras, a larger than the normally caught flying fish was observed in large quantities and was successfully caught by gillnets. The season of abundance appears to be longer than believed at present. This flying fish may therefore constitute a significant and largely underexploited resource.

**Targets 1989**

Assessment of the feasibility through commercial fishing trials from one centre covering the season of availability (March - August).

Recommendations for follow-up work.

**Future**

Depending on the results of fishing trials, demonstration of the gillnet method to other fishing centres.

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*Subproject*

*Outrigger Canoes, Indonesia (FIT/ORC/INS)*

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*Objective*

**Development and demonstration of plank built outrigger canoes as alternatives to traditional fishing craft to increase incomes of fisher-folk and production of underexploited resources.**

The target group are the fisher-folk of Nias Island who almost all are small-scale operators employing small traditional craft of limited capacity and range of operation.

Status 1987

A preliminary study of small-scale fisheries of the east coast of North Sumatra indicated that Langkat district offered the best scope for small-scale fisheries development but only in offshore areas for demersals.

#### **Targets 1988**

A detailed study of small-scale fishing operations in Langkat district which may include experimental fishing trials

Preparation and commencement of a subproject

#### **Achievements**

A field survey was conducted during two months. The scope for further development of the capture fisheries was found too limited to justify a capture oriented subproject; all resources appear to be heavily and efficiently exploited already. It was concluded that the west coast might offer better opportunities.

In a field survey of the west coast of North Sumatra, the Nias Island was identified as having good scope for production-oriented small-scale fisheries development. The survey resulted in description of the Nias Island fisheries and a subproject proposal for introduction of new types of outrigger canoes.

Designs of these prototype canoes and arrangements for their construction have been completed.

#### **Assessment**

The low level of productivity in limited ranges of operation of the fishermen of Nias Island and the plentiful fishery resources are indications that the subproject may lead to good results. Arrangements are well under way to produce such results in 1989.

#### **Targets 1989**

Construction and technical trials of three outrigger canoes.

On-the-job training of local boat-builders.

Commercial fishing trials and demonstrations with the three canoes for about 8 months.

Socio-economic profile of the fisherfolk communities.

Assessment of the market for increased and diversified fish production.

#### **Future**

Continuation of fishing trials to complete a full year's cycle of commercial fishing.

Technical and economic evaluation of each type of outrigger canoes with recommendations for follow-up.

Continued support for such follow-up activities.

#### **FISHERY RESOURCES**

The work programme consisted of two subprojects - Kattumaram fisheries in India and Set bagnet fisheries in Bangladesh – as well as general ad hoc activities related to other subprojects of the programme.

Under the subproject on kattumaram fisheries in Andhra Pradesh, six months of integrated study (involving the resources, fishing technology, socio-economics and post harvest technology units) have been completed in a fishing village (Pallipalem, Kothapatnam, Prakasam District). The aim is to identify ways and means of improving the earnings and livelihood of the kattumaram fisher-folk of the village and to enlighten them on various aspects of fisheries technology and fisheries management. An interim evaluation of the results will be undertaken in January 1989 after discussing these with the fisherfolk. The set bagnet activities could not be started, but preparations have been made for the work to start as soon as the Government clears it. The "Fisheries Resources" unit has interfaced with all the other disciplines of BOBP. Major inputs have been provided to the post harvest fisheries and to beachlanding craft activities in India, and to fishing technology work in Indonesia.

About half of the year's effort has been devoted to separately funded national projects implemented through BOBP. Two FAO projects dealt with exploratory tuna fishing in Maldives and Sri Lanka (TCP/MDV/6653 and TCP/SRL/6651); there was also one FAO/UNDP project concerning reef fisheries surveys (MDV/85/003). Barring the tuna fishing project in Maldives, these projects have been satisfactorily completed. They have provided very valuable information on the respective fishery resources. Details about these projects are reported on separately.

The only problem encountered during the year has been the delayed implementation of the studies on kattumaram and set bagnet fisheries for reasons beyond the control of BOBP. The studies as such are not affected by the delay; what causes concern is that the time available for follow-up will be minimal.

The main target for 1989 is the conduct of studies on kattumaram and set bagnet fisheries. Extensive interface with all other BOBP disciplines is foreseen and further support on reimbursable basis will be given to the second phase of the reef fisheries survey in Maldives. Since Fishery Resources is a critically important Programme component it should be continued to be funded under GCP/RAS/118/MUL if other sources cannot be mobilised.

<b>Subproject</b>	General/ Services (RES/GEN)
<p><b>Targets 1988</b></p> <p>Reimbursable support to other projects</p>	<p><b>Achievements</b></p> <p>Completed as planned for :</p> <ul style="list-style-type: none"> <li>- FAO/TCP Exploratory Tuna Fishing, MDV, SRL</li> <li>FAO/UNDP Reef Fisheries Survey, MDV</li> <li>- FAO/ADB Fisheries Sector Study, SRL</li> </ul> <p>Internal BOBP cooperation :</p> <ul style="list-style-type: none"> <li>- Fishing Technology, INS</li> <li>- Beachlanding Craft, IND</li> <li>- Post Harvest Fisheries, IND</li> </ul>

**Assessment**

Satisfactory completion of projects for Reef Fisheries in Maldives and Tuna Fishing in Sri Lanka but less so for the latter in Maldives. The Programme would be severely hampered without a Fishery Resources component and should continue to be funded under GCP/RAS/118/MUL if other sources cannot be mobilized.

**Targets 1989**

- Reimbursable support to other projects
- Reef Fisheries Survey, MDV (FAO/UNDP)
- Internal BOBP cooperation
- Post Harvest Fisheries, IND
  - Fishing Technology, IND
  - Brackishwater culture, BGD, IND
  - Extension subprojects

**Future**

General services and support to other projects will continue throughout the project.

Subproject	<i>Kattumaram Fisheries, India (RES/KAT/IND)</i>
Objective	Assess the bio-socio-economics of an existing kattumaram fishery; study of problems and difficulties of the fisherfolk; to identify ways to raise incomes by better utilization of available resources through innovative fishing methods, improved marketing practices and other income-generating activities.
<p><b>Targets 1988</b> Survey of the biological, technological, socio-economic and marketing aspects of the kattumaram fisheries at one centre each in Orissa, Andhra Pradesh and Tamil Nadu</p> <p>Conduct experiments and training if found appropriate.</p>	<p><b>Achievements</b> Orissa was deleted because of heavy workload also because of the relatively less important kattumaram fishery in this state. Tamil Nadu was deleted for lack of state government support. Recruitment, training and deployment of a field officer in the study village in Andhra Pradesh. Data being collected since August 1988 in cooperation with the ODA project (responsible for marketing and other post-harvest matters including one field officer). Not yet undertaken pending preliminary analysis of data and a dialogue with the fisherfolk (planned for January 1989).</p>
<b>Assessment</b>	After some initial delay, the collection of data and other information is working well.
<b>Targets 1989</b>	
Completion of one year of data collection. Discussing the results and information and the findings with the kattumaram fisherfolk and obtaining their feedback. Periodic meetings with fisherfolk to exchange ideas and assist in measures for improving living standards and incomes. Reporting of the one year-study.	
<b>Future</b>	Dependent on the outcome of the study.

Subproject	<i>Set Bagnet Fisheries, Bangladesh (RES/SBN/ BGD)</i>
Objective	Better understanding of the functional mechanism of the gear with reference to the biological and socio-economic aspects of the fishery, vis-a-vis other interactive fisheries. The set bagnet fisheries account for about 30% of the marine/brackishwater catch. Preliminary investigations indicate that set bagnet fisherfolk are extremely poor and that the fishery leads to heavy exploitation of juvenile fish and prawns. <i>See Bay of Bengal News No. 29.</i>
Status 1987	Preliminary investigations had been conducted and the need for a detailed study was established.
<b>Targets 1988</b>	<b>Achievements</b>
Intensive sampling of the set bagnet fisheries	Work plan was prepared, personnel requirements identified and availability determined. Data forms prepared, sampling guidelines discussed with counterpart officials and sites identified. Start of sampling awaits GOB clearance of BOBP activities.
Determine socio-economic factors	Not commenced, pending above GOB clearance.
<b>Assessment</b>	Almost a full year has been lost. The delay will not affect the study as such but the time available for follow-up actions will be minimal.



### **Targets 1989**

Recruitment of field staff by BOBP, training of field staff and procurement of equipment.

Sampling of set bagnet and other interactive fisheries.

Assessment of the socio-economic conditions of set bagnet fisherfolk.

### **Future**

Completion of the study during the first half of 1990; work thereafter will depend on the outcome of the study.

### **DEVELOPMENT SUPPORT**

The work undertaken in 1988 can be divided into six areas namely

- Follow-up of pending project proposals, which resulted in only two out of seven being approved for implementation.

Preparation of project proposal in West Bengal, which has suffered delays.

- Bridging support to two completed pilot projects before full scale follow-up.
- An overall review of critical issues for fisheries development and specific studies on TCDC, Pollution, and Search and Rescue systems for fishermen in distress.
- Economic analysis of technical activities under Brackishwater and Fishing Technology.

Evaluation of past subprojects (pen culture and credits)

The yield from pending project proposals has been much less than anticipated. It seems that the projects are not large enough to generate the necessary interest both at the giving and the receiving end, to enable them to get through the various procedures of approval and action within a reasonable time before they are lost or forgotten.

Two major subprojects are proposed under the work programme for 1989. One is the identification and preparation of projects in West Bengal. It will include a comprehensive review of the small-scale marine fisheries sector. The second subproject concerns training in project preparation for middle-level fisheries planning officers. Besides, new technologies attempted by the Brackishwater Culture and Fishing Technology unit will be analysed for economic viability, and follow-up recommendations for investments will be made if appropriate.

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<i>Subproject</i>	<i>Preparation and promotion of small-scale fisheries projects and ad hoc services (DEV/GEN)</i>
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### **Targets 1988**

To reach conclusive decisions on pending project proposals

Evaluation of terminated subprojects Pen Culture Project in Killai and Credit Project in Orissa

Identification and preparation of project proposals in West Bengal

### **Achievements**

Non-formal adult education for fisherfolk in Tamil Nadu approved by DANIDA.

Training of women link workers in Tamil Nadu State Government contribution unresolved.

Bank services for artisanal coastal fisher-folk in India (east coast) - States' interest to be ascertained and donor to be identified.

Demonstration of offshore small-scale pelagic fishing in India(east coast) -- under consideration by GOI.

Introduction of driftnetting for Tuna in Indonesia (West Sumatra) – under consideration by GOI.

Completed and reports sent to parties concerned. The evaluation of the credit project was summarized in *Bay of Bengal News* No. 29. BOBP's pen culture trials at Killai and in Sri Lanka will be evaluated in a future issue of *Bay of Bengal News*.

Started. Full-scale mission in 1989 proposed in a separate subproject.

Investigation of TCDC possibilities	Completed, but full report will be ready only next year. Major potential contributors appear to be Thailand (small-scale hatcheries and cage culture for prawns) and Sri Lanka (small-scale offshore fishing).
Preliminary study of effects of pollution on fisheries	Completed but full report available only in 1989. There are some clear cases of adverse effects of pollution on the fishery resources. To determine the seriousness and the extent of pollution effects, more detailed surveys and analysis of already existing data are needed. A project is being proposed.
Preparation of new project proposals	Search and Rescue Services (SAR) in Sri Lanka a study has been undertaken and reported on. The SAR service is beyond the competence of BOBP; recommendations for preventive measures to train fishermen and equip the boats are being worked out under FIT/FBD/SRL. See <i>Bay of Bengal News No. 31</i> .  Utilisation of shell fish resources in Malaysia - no work done.  Fishery Resources studies in Sri Lanka - postponed pending outcome of ADB/FAO sector study.
Maintain an overview of fisheries development in the region.	Current views among key officers of BOBP's cooperating agencies and BOBP's experiences have been gathered and analysed. The outcome is presented in IOFC : DM/BB/89/4 "Critical issues for fisheries development in the Bay of Bengal region", supplemented by IOFC : DM/BB/89/Inf. 4 Add, "Externally supported projects in the Bay of Bengal region".

**Assessment**

Much less than anticipated yield from the pending project proposals.

Other activities somewhat short of targets but studies concerning TCDC, pollution and SAR are likely to generate follow up.

**Targets 1989**

Preparation of project proposals :

- Investment project for small-scale offshore fishing, India.

Internal BOBP cooperation (economic analyses)

- Oyster culture, MAL
- Seaweed culture, IND
- Beachlanding craft, IND
- Fisherfolk Credit, SRL

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*Subproject*

*Training in Project Preparation (DEV/TPP)*

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Objective	Training of middle-level planning officers to prepare project documents for small-scale fisheries development as required for financing by donor agencies.  The training programme would cover all seven countries if they are interested.
Status 1988	India requested such a training programme early in the year.

**Targets 1989**

Preparation of training material.

Conduct the training in two courses spaced by a couple of months.

**Future**

In-service support to selected trainees engaged in actual project preparation in their respective administrations.

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<i>Subproject</i>	<i>Non-formal Primary Education in Orissa, India (DEV/EOR/IND)</i>
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Objective	To ensure satisfactory functioning of existing 40 NFPE centres in Orissa till the new donor agency's (NORAD) funding commences.
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Status 1987	Some of the 40 n&n-formal primary education centres established during BOBP's pilot project period were reportedly ailing for lack of financial support and supervision. A new project proposal for continuance of these centres and for establishment of 60 additional centres with external funding support was awaiting clearance/approval.
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**Targets 1988**

Extension of financial assistance to the ongoing programme to bridge the period before the commencement of the new project

**Achievements**

Financial and managerial assistance has been provided throughout the year. The ailing centres have been strengthened.

The project for continued support and establishment of new centres (60) has not materialised. NORAD has queried the finance for school buildings and SCERT questions the appropriateness of DOF as implementing agency.

**Assessment**

The delay in funding has led to disinterest among the field officers and disappointment among the villagers. The future of the project is very much in jeopardy. BOBP's input has been terminated.

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<i>Subproject</i>	<i>Project identification and preparation in West Bengal, India (DEV/WEB/IND)</i>
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Objective	Preparation of project proposals for the development of small-scale marine and brackishwater capture fisheries.
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Status 1988	Familiarisation visits undertaken to West Bengal to collect basic information.
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**Targets 1989**

An inventory of the marine fisheries including brackishwater culture.

Identification of suitable measures to come to grips with problems and issues hampering development.

Proposals for new projects for investment and technical assistance

**Future**

Promotion of project proposals

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<i>Subproject</i>	<i>Motorization of Chandi Boats in Bhola, Bangladesh (DEV/MCB/BGD).</i>
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Objective	Promoting motorization of country craft (Chandi boats) to increase the incomes of fishermen by demonstrating to banks the feasibility of a credit scheme.
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Status 1987	A project proposal for issuing 50 longtail engines with DANIDA finance was awaiting GOB approval. Meanwhile it was agreed to issue 10 engines under BOBP financing.
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### **Targets 1988**

Installation of engines (10), technical support, monitoring the fishing activity and collection of instalments

### **Achievements**

Ten more engines were added, and in total 20 engines were installed.

Repayments were disrupted because of extreme weather conditions (floods and cyclones) which affected fishing operations. The clearance of the new project for 50 engines to be funded by DANIDA is still awaited.

### **Assessment**

The objective is being achieved, but progress is slower than anticipated.

### **Future**

Monitoring of the performance and collection of instalments will continue as minor activity while further motorization will be done under the DANIDA-sponsored project.

### **INFORMATION SERVICE : GCP/RAS/117/MUL**

#### **Performance highlights during 1988 :**

The main feature of Bay of Bengal News during the year was its thematic emphasis. Three themes or subjects were highlighted in three issues: "Malacca Straits; "Safety at sea" and "Post-harvest technology". It is believed that such thematic issues further the cause of information, analysis and debate better than a general mix of articles does. The package on "Safety at sea" (September 1988) has been well received, particularly its suggestions on what equipment fishermen should carry. A suggestion has been made for its publication in regional languages.

Three technical reports were out during the year.

BOBP/REP/41 Studies of the Tuna Resource in the EEZs of Maldives and Sri Lanka.

BOBP/REP/42 Report of the Twelfth Meeting of the Advisory Committee.

BOBP/WP/59 Fishery Statistics in the Bay of Bengal.

The Programme's *use of visual media* got a fillip, with the hiring of a seasoned *video* cameraman late in the year. A film on beachcraft is being made, and video clips have been prepared on pen culture in Chilaw, small-scale fisheries in Negombo and seaweed culture in Mandapam. Video is said to have tremendous potential as a development and promotional tool, and the Programme hopes to learn first-hand about what video can do. One of video's applications is to stimulate interest among rural target groups by instant playback of field footage. This is still to be tried out, as the first priority has been to record some of the Programme activities in video. New professional equipment is being ordered. *Contacts* have been initiated with other *video production outfits* such as Worldview International Foundation, which is active in the region and channels cultural exchanges among SAARC countries through video films. Cooperation with WIF has been initiated in a small way, and this may expand.

An important event during the year was a three-day *regional consultation on fisheries information*. Some 20 delegates from Bangladesh, India, Maldives and Sri Lanka took part. That fisheries bodies in the region often duplicate effort and are unaware of the information other organizations possess or prepare, became quickly apparent. Also highlighted was the need to standardize definitions of fisheries terminology ("off-shore", "small-scale" and "deep-sea" mean different things to different people). The need to improve documentation and to modernize data collection, storage and retrieval systems was also evident. The consultation urged that a composite picture be obtained of all data sources on fisheries in the region; a regional agency should devise a format for the purpose.

However, a permanent institution has to be identified which will serve as a coordinator of fisheries information in the area, and make possible a fisheries information network in the region. Meanwhile, BOBP has requested the Chairman, SAARC Documentation Committee, to explore the possibility of including fisheries information under SAARC cooperation mechanisms.

The *1988 desk calendar*, based on sketches of small-scale fisheries, was as popular as its predecessor. Work was taken up on a colour brochure on BOBP, but it will be finalized and produced in 1989.

*Cooperation with other institutions* : Assistance was provided to ALCOM, a regional FAO/SIDA aquaculture programme based in Zambia, Africa. A factsheet, a newsletter and a colour brochure on ALCOM were produced.

The Programme's draughtsman-artist served as consultant for two weeks to the DANIDA-assisted project "Tamil Nadu Women in Agriculture", and helped to train women extension staff in the use of audio-visual aids.

**Problem areas and issues of concern :**

*Communicating with fisherfolk* : How best can one communicate with fisherfolk? How can one induce change in fishing communities? What are the best techniques of persuasion in dealing with them? The subject has aroused some discussion at BOBP, among the fishery resources, fishing technology, extension and information units. Available literature is mostly about farming communities. There is almost no literature on the subject of communication with fisherfolk. Facts and findings on fisherfolk communication would be of immense value to various units of BOBP; and also to fisheries planners and extension/information specialists throughout the region. A draft proposal has been formulated for a one-year project that will study some aspects of this subject.

*Information dissemination* : Requests for BOBP literature – the newsletters and technical reports -- come in from far and near, even from non-fisheries organizations. Individual scientists frequently want entire sets of BOBP publications. The Information Service is selective in meeting requests, since several publications are already out of stock, and gives priority to the needs of governments and government institutions of the region. Mailing costs are charged for bulk despatch. The Information Service *mailing list* is computerized, but needs frequent revision and updating. Usually, because of additions to the list, sometimes because of transfers and address changes -- news of which comes to the Information Service very gradually. Information dissemination is very time-consuming. Also time-consuming is visitor briefing: the BOBP office has more visitors than ever before, many of them unscheduled.

The *Library* is expanding in size and in range of operations. It might be necessary to computerize holdings – of books, documents, photographs, etc.

**Targets 1989**

Newsletter – four issues

Reports                      Approximately eight working papers, four reports and two manuals

Colour brochure

New audio-visual on BOBP

Video clips of major Programme activities

Desk/Calendar for 1990

Pamphlet on pension and social security schemes for fishermen in Sri Lanka

Educational video film on offshore fishery in Sri Lanka

Computerization of library holdings

**PROJECT INPUTS AND THEIR UTILIZATION**

The 1988 budget of GCP/RAS/118/MUL was set at US \$1.7 million in consultation with the donor agencies after the 12th Advisory Committee meeting. The actual expenditures are estimated at US \$1.5 million. A major reason for the under delivery, is that hardly any work has been undertaken in Bangladesh pending the Government's formal agreement to the work programme. Details of budgets and expenditures as per FAO accounting codes are given in Table 1a. Deposits received as cash contributions from the participating governments and the corresponding expenditures are given in Table 1 b.

It is estimated that Extension will account for 29% of the expenditures, Brackishwater Culture for 24%, Fishing Technology 20%, Fishery Resources 8%, Development Support 9%, and Information Service 10%. The forecast for 1989 is relatively higher expenditures than in 1988 for Extension and Development Support, lower for Brackishwater Culture and Fishing Technology and no change for Fish Resources and Information Service.

A Development Adviser and a Socio-Economist joined during the year. All professional posts listed in the project document were thereby filled. In addition a Fishery Biologist and a Masterfisherman, partly funded by national projects implemented through BOBP, have been on the staff. Details of the posts together with those of national officers and international consultants are given in Table 2. No change in the professional staffing is proposed for 1989.

Eight new Associate Professional Officers (APO) joined during the year. One of them is stationed outside the regional office, in Ranong, Thailand. That post was temporarily filled earlier in the year for six months by another incumbent. One APO left after a three year assignment and one other left after one year. Details are given in Table 2. Four more incumbents – Economists (2), Sail Specialist and Fish Technologist – are expected early in 1989. An Information Officer post is vacant.

Posts for an Aquaculturist in Penang and a Sociologist in Medan are also vacant. For 1989 it is proposed to establish APO posts for Sociologists in Bangladesh, Maldives and Sri Lanka and perhaps reduce the number of such posts in Madras.

The supporting staff employed at the end of 1988 are listed in Table 3. Costs of common services are shared with the ODA project on a *pro rata* basis. The need is felt to engage a full-fledged national Administrative Officer instead of an Assistant to reduce the burden of admin work, mainly on the Programme Director. No other changes in the supporting staff are foreseen during 1989/90.

The input for training has been less than anticipated because of the delayed implementation of subprojects in Bangladesh and of Extension subprojects in general. Details of the training activities are given in Table 4. The training work will pick up considerably during 1989 and the costs of it will partly be met by the new AGFUND project.

Table 1a  
GCP/RAS/118/MUL - Budget and Expenditures (In US \$)

Code	Object of exp	Budget 1987-91	Act exp 1987	Budget 1988	Est exp 1988	Preliminary Budget 1989	Balance 1990-91
10	Personnel	3 125 000	430 411	662 000	648 875	758 850	
20	Duty Travel	550 000	79 739	140 000	127 323	195 450	
30	Contracts	485 000	118 171	200 000	137 627	283 325	
40	Ope. exp	440 000	52 716	100 000	67 588	102 025	
50	Materials	430 000	73 461	110 000	51 016	124 500	
60	Equipment	240 000	61 708	160 000	182 261	119 750	
80	Training	520 000	55 471	150 000	74 538	131 200	
	Sub Total	5 790 000	871 677	1 522 000	1 289 228	1 715 100	
90	Servicing Cost13%	752 700	113 318	197 860	167 600	222 963	
	Sub Total	6 542 700	984 995	1 719 860	1 456 828	1 938 063	
	Unspecified	1 234 525	-				
	Grand Total	7 777 225	984 995	1 719 860	1 456 828	1 938 063	3 397 339

Table 1b  
GCP/RAS/117/MUL Deposits and Expenditures

Code	Object of exp	Deposits 1987-88	Actual exp 1987	Estimated exp 1988	Preliminary Budget 1988	Balance 1990-91
10	Personnel			67 305	74 900	
40	Op. exp		3 436	(3 083)		
	Sub Total		3 436	64 222	74 900	
90	Servicing cost13%		172	3 211	3 745	
	Grand Total	146 867*	3 608	67 433	78 645	(2 819)

\* Does not include contribution of US\$ 38 090 yet to be received for 1987 and 1988.

Table 2

## GCP/RAS/118/MUL – Professional Staff · 1988

## International Officers

Post	Name of Incumbent (nationality)	Date of (month/year)	
		Arr.	Dep.
1. Programme Director	Engvall, L O (Sweden)	01/87*	
2. Development Adviser	de Mautort (Ms) A (France)	06/88	
3. Aquaculturist	Angell, C (USA)	01/87"	
4. Fishing Technologist	Pajot, G (France)	01/87*	
5. Extension Officer	Roy, R N (India)	01/88	
6. Socio-Economist	Canter Visscher (Ms) D (Netherlands)	10/88	
7. Information Officer**	Madhu, S R (India)	01/87*	
8. Fishery Biologist	Sivasubramaniam, K (Sri Lanka)	05/87	
9. Masterfisherman	Gallene, J (France)	03/88	
10. Training Officer (Ass. Prof. Officer)	El Gendy (Ms) G (Netherlands)	03/88	
11. Aquaculturist (Ass. Prof. Officer)	Kalkman (Ms) B (Netherlands)	03/88	
12. Marine Engineer (Ass. Prof. Officer)	Karlsson, R (Sweden)	02/88	
13. Sociologist (Ass. Prof. Officer)	Kvam, R (Norway)	04/88	09/88
14. Sociologist (Ass. Prof. Officer)	Kristensen (Ms) H (Denmark)	10/88	
15. Economist (Ass. Prof. Officer)	Luginbuhl, N (Switzerland)	09/87	09/88
16. Socio-Economist (Ass. Prof. Officer)	Lundqvist (Ms) C (Sweden)	03/88	
17. Aquaculturist (Ass. Prof. Officer)	Nielsen, H B (Denmark)	10/88	
18. Fishing Technologist (Ass. Prof. Officer)	Nystrom, U (Sweden)	11/88	
19. Socio-Economist (Ass. Prof. Officer)	Poiesz (Ms) A (Netherlands)	03/88	
20. Aquaculturist (Ass. Prof. Officer)	Reyntjens, D (Belgium)	01/87	11/88
21. Sociologist (Ass. Prof. Officer)	Townsley, P G (Canada)	08/87	



**National Officers**

Post	Name of Incumbent (nationality)	Date of (month/year)	
		Arr.	Dep.
1. Sociologist	Buranakanonda, A (Thailand)	06/88	12/88
2. Credit Officer	Fernando, C (Sri Lanka)	08/88	
3. Project Officer	Joseph, L (Sri Lanka)	07/87	
4. Project Officer	Kashem, A (Bangladesh)	01/87*	
5. Radio Officer	Nelson Jayaweera, H (Sri Lanka)	11/88	
6. Marine Engineer	Ramesh, V (India)	02/88	

**International Consultants**

		m/m
1. Prawn seed collection (IND)	Chavez, M J (Philippines)	2.00
2. TCDC activities within region	Fernando, C (Sri Lanka)	1.75
3. Gracilaria spore setting (IND & SRL)	Fisher, J (USA)	1.50
4. Boat design, construction, evaluation (IND, MDV, SRL)	Gulbrandsen, O (Norway)	3.75
5. Pollution (BGD, IND, SRL)	Hallbaeck, H (Sweden)	2.00
6. Maritime Safety (SRL)	Hallberg, U (Sweden)	0.75
7. Development Adviser (IND)	Raja, B T A (India)	4.00
8. Aquaculture (SRL)	Reyntjens, D (Belgium)	1.00
9. Extension, (MDV)	Tietze, U (FAO)	1.00

\* transferred from GCP/RAS/040/SWE

\*\* Costs covered by GCP/RAS/117/MUL

Table 3

GCP/RAS/118/MUL – Supporting Staff – 31.12.88

**Management and Administration (Madras)**

Scurville (Ms) S	Sr. Admin Assistant
Rajagopal, K	Admin Assistant (Accounts)
Ashwene, H	Computer Technician
Jayakumar (Ms) E	Secretary
Abraham (Ms) I	Typist
Shanmugam, T P	Senior Driver
Sivashanmugam, P M	Senior Driver
Rajendran, S	Driver
Farrar, R	Messenger

**Information Service (Madras)“”**

Vijaykumar, K	Videographer/Photographer
Bhavani (Ms) V	Documentalist
Amalore, E	Artist/Draughtsman
Jayaraj, S	Artist
Gordon (Ms) P	Secretary

**Secretarial Service (Madras)**

Baptist (Ms) J	Secretary
D'Costa (Ms) G	Secretary
Paul (Ms) M	Secretary
Saldhana (Ms) S M	Secretary

**National Office (Dhaka)**

Syed, Nural H I	Typist
Kakir, A Q	Driver

**National Office (Colombo)**

Kelaart (Ms) C	Secretary
Premaratne, A D	Driver
Rohana Pieries, P	Driver
Ranjith, A D	Messenger

\*\* The costs of staff of the Information Service are covered by GCP/RAS/117/ MUL.

**Table 4**  
**GCP/RAS/118/MUL Training Activities\* – 1988**

S.No	Title	Duration (days)	Venue	Number of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
<b>1.</b>	<b>Consultations/Seminars/Workshops</b>									
1.1	Review of results of field enquiries among fisherfolk for fisheries and extension officers	5	Langkat District			20				
1.2	Participatory planning exercises in three pilot villages for fisherfolk	6	Langkat District			150				
1.3	Disease prevention, treatment and feeding in fish cage culture for fish farmers	2	Ranony							42
1.4	increasing productivity of small-scale fisheries in Tamil Nadu for fisherfolk	3	Madras		44					
1.5	Regional consultation on fisheries information for information officers and scientists	3	Madras	2	16		1	2		
1.6	Squid trap operation and protection of traps for fishermen	1	Ranong							45
1.7	Fisherfolk credit in Sri Lanka for Minfish and bank officers excluding short and long-term in-service training	1	Colombo						31	
<b>2.</b>	<b>Training Courses</b>									
2.1	Cooking, nutrition & utilization of local ingredients for fisher-women	6	Ranong							80
2.2	Stability test of new offshore boats for Minfish technical staff	5	Colombo						9	
2.3	Spore setting and outplanting of Seaweed ( <i>Gracilaria</i> ) for NARA and Saravodya staff	14	Puttalam Sri Lanka						9	

S.No.	Title	Duration (days)	Venue	Number of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
2.4	Spore setting techniques & seaweed culture for farmers	10	Ramnad District		9					
2.5	Maintenance of seaweed farms for Farmers	2	Ramnad District		10					
2.6	Preparation of socio-economic inventory for fisheries and bank field officers (3 batches)	13	Colombo						82	
2.7	Radio programming for radio unit staff and fisheries officers	43	Colombo						10	
2.8	Engine usage Et maintenance on beachlanding craft for fishermen/operators	10	Orissa		50					
2.9	Preparation of bio-socio economic survey of kattumaram fisheries for field investigators	10	Andhra Pradesh		2					
2.10	Commercial oyster farming for two research officers and one potential farmer	28	Korea				3			
2.11	Improved techniques for prawn seed collection	3	West Bengal		186					
3.	<b>Study Tours</b>									
3.1	Crab fattening for fishermen	2	Surat Thani							8
3.2	Oyster farming in Thailand for research and extn. officers	10	Thailand				12			
3.3	Fisheries educational 8 research institutions for senior officers	8	India						2	
3.4	Credit schemes and beachlanding craft introduction for Senior Officers	8	India						1	
3.5	Participation in world symposium on fishing craft and gear design		Canada						1	

## Appendix F

### ODA PO.ST-HARVEST FISHERIES PROJECT – ANNUAL REPORT 1988

#### Introduction

The post-harvest project, although separately funded and executed by ODA, is a fully integrated technical unit of BOBP. An overview of the whole Bay of Bengal Programme is given in the progress report submitted to the BOBC. Details of the SIDA/DANIDA project are given separately. This year represents the first full reporting period for the post-harvest project which commenced in August 1987.

Following initial project identification, and appraisal of felt needs, nine activities were initiated in India and Sri Lanka. Two project proposals have been submitted for Bangladesh and it has been agreed in principle to prepare a proposal for the Maldives.

Major areas of collaboration between the post-harvest project and other technical disciplines in BOBP include the activities in India with non-government organisations, the kattumaram fishery in Andhra Pradesh, and seaweed in Tamil Nadu. Specific references to collaboration are given in the tabulated summaries by reference to sub-project codes.

#### Highlights

The volume of shrimp trawler by-catch currently being thrown back into the sea off the east coast of India is estimated at 130,000 tonnes per annum. At present trawler operators do not find it economical to land the bulk of the non-shrimp catch. Investigations are continuing in an attempt to identify economically viable options for landing what are normally regarded as fish of little or no value.

Low-value fish is a useful protein source for lower income sectors of the community but there is also a need for much greater quantities of fish meal. A comprehensive review of the potential for prawn feed manufacture in India indicated that all the major components for a balanced grow-out feed are available and that there is manufacturing capacity for small-scale production. However, the major constraint to much needed large-scale manufacture is a gross shortage of fishmeal. Provision of feed for the expanding prawn aquaculture business is of concern to many countries.

- Strategies for improving the marketing of fish should be based on products of good quality. Demonstrations were held in Andhra Pradesh to show how to ice fish at sea on-board the traditional navas, which presently do not use ice and land part of their catch in poor condition. Prototype locally manufactured insulated fish boxes are currently being evaluated on commercially operated motorised navas.
- A proposal to investigate the marketing of fish caught by motorised Chandi boats in Bangladesh is awaiting approval. Preliminary baseline investigations into the present market channels for fish on the east coast of India were undertaken in West Bengal and Andhra Pradesh.
- Several areas of possible technical collaboration with non-government organisations in Tamil Nadu and Andhra Pradesh were identified to improve utilisation and marketing of fish. Improved utilisation of waste products from the seafood processing industry in Sri Lanka is the focus of an activity taken up late in the year with the National Aquatic Resources Agency.
- A comprehensive study of the Indian seaweed industry indicated that there is adequate capacity to process both agar and alginate bearing seaweeds for the domestic market but that processors are undersupplied. Seaweed collectors have not benefited from this situation because of the control exerted over the market by middlemen. Recent developments in Thailand, not connected with the project, provided an appropriate technology for village-level extraction of crude agar from seaweed. This provides the opportunity for value-added production in the fishing villages of Tamil Nadu where the collection of seaweed is presently practised.

### Problem areas

Difficulties have been experienced in locating sufficient and suitable local consultants to service the project. It is hoped to overcome this in the long term by creating a greater national interest in post-harvest activities.

### Main Thrust for 1989

Greatest efforts will be in promotion of on-board use of ice, particularly on the east coast of India, and further investigations into constraints in different market systems. The magnitude of the discard of by-catch makes it necessary to continue efforts to identify ways of reducing the present levels of wastage. Production of manufactured prawn feed should improve the utilisation of low-value fish. A survey of the seaweed industry will be undertaken in Sri Lanka. It is hoped to be able to extend appropriate technology for village-level extraction of agar in Tamil Nadu.

A national programme in Sri Lanka to develop collaboration and exchange of staff between the National Aquatic Resources Agency and the Overseas Development Natural Resources Institute (U.K.) will be implemented through the project in 1989.

### Expenditure

Estimated expenditure for 1988 : £ 135,200 (US \$ 243,300)

### Staff – 1989

Post	Name of Incumbent (Nationality)	Date of Arrival
<b>Core staff</b>		
1. Post-Harvest Fisheries Adviser	Walker, D. J. (U.K.)	August 1987
<b>Consultants</b>		
		<i>Man Months</i>
1. Improved utilisation of low-value fish, and marketing, India	Rajendran, A.D.I. (India)	8.5
2. Shrimp trawler by-catch, and marketing, India	Seetharamaswami, A. (India)	5.5
3. Kattumaram fishery, India	Ramasamy, I. (India)	5.5
4. Seaweed industry, India	Nambiar, P. (India)	3.5
5. By-catch, India	Gordon, A. (U.K.)	2.5
6. NGOs, India	Sanders, A. (U.K.)	2.0
7. Utilisation of low-value fish for prawn feed, India	Coulter, J. (U.K.)	2.0
8. Utilisation of low-value fish for prawn feed, India	Wood, J.F. (U.K.)	2.0
9. Use of ice at sea, India	Clucas, I.J. (U.K.)	1.5
10. Use of ice, Tamil Nadu, India	Parasuraman, G. (India)	1.0
11. Processing of seaweed	Coppen, J.J.W. (U.K.)	1.0
<b>Supporting staff (Madras)</b>		
Secretary	Emmanuel, P.	

**ODA Post Harvest Fisheries Project – Annual Report 1989 (Continued)**

<b>Subproject :</b>	<b>Utilisation of low-value fish in India (ODAP1/IND)</b>
Objectives :	<p>Improve utilisation of fish and fish products so as to increase financial return to fisherfolk.</p> <p>The target groups are fishermen who land low-value fish which cannot find a market for human food, and prawn farmers who do not have adequate supplies of prawn feed. Presently large quantities of spoilt fish are used as agricultural manure. Utilising it as a component of manufactured prawn feed would result in a higher economic return to the supplier. Benefits to prawn farmers would be substantial because lack of readily available manufactured feed is a major constraint.</p>
Status 1987	Project proposal prepared.
Targets – 1988	Achievements
1. Determine seasonal availability and technical suitability of underutilised fisheries products for inclusion in prawn feed. Assess local capacity and expertise to formulate and manufacture nutritionally balanced pelleted feed.	<p>Inventory of available raw materials and an in-depth study of the seasonal availability and logistics of supplying a domestic feed industry were completed.</p> <p>These indicated that all major components for a balanced grow-out feed are available in India; there is manufacturing capacity to produce feed on small-scale. Major constraint to development is the poor quality and gross undersupply of fishmeal. National shortfall is large and unlikely to be met by upgrading underutilised fish. Poultry feed industry already offers ready market for available fish.</p>
2. Determine present and future market demand for manufactured prawn feed, quantify level of imports, and ascertain commercial feasibility of import substitution.	<p>Studies indicate present capacity is 3,700t per annum. The demand for balanced pelleted feed is forecast as 18,000t (1991), 35,000t (1995) and 80,000t (2000). Domestic feed industry is considered commercially feasible if shortage of fishmeal can be overcome.</p>
3. Ascertain economic feasibility of prawn feed manufacture in India on both large and small scale.	<p>Preliminary indications are that manufacture could be economical depending on quality and availability of marine protein component.</p>
4. If production at cooperative or similar level is economically viable, install and demonstrate feed mill for use by prawn farmers. If production on large scale is commercially viable, to make suitable recommendations to the Marine Products Export Development Authority.	<p>No action</p>
Assessment	<p>Indications are that the shortfall of fishmeal for prawn feed is so great that it cannot be remedied by utilising the available low-value fish. There already exists an unfulfilled requirement for fishmeal from the poultry feed industry - hence a ready market already exists.</p>

There are areas where spoiled fish cannot find an outlet as poultry feed and the possibility of localised small-scale manufacture of prawn feed remains. The prawn feed industry is important in terms of national development. Assistance to groups of small-scale farmers in setting up small feed mills to meet local supply will be a worthwhile longterm activity.

Targets -- 1989

1. Increase utilisation of low-value fish in small-scale prawn feed plants by formulating feed from local ingredients and evaluating its performance. (In collaboration with Indian Council for Agricultural Research).
2. Training courses to instruct fisherfolk women in processing of value added products from low-value fish. (In collaboration with CIFT)

#### Future

This is a difficult but very important activity. It will be a major focus of the project.

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*Subproject :* *Marketing and processing of seaweed in India*  
ODA/P2/IND

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*Objectives :* Strategy for marketing seaweed, and potential for artisanal storage or processing.

To ensure that the target group of small-scale collectors and potential farmers of seaweed receive maximum returns for their activities. An efficient marketing strategy for cultivated seaweed (SWD/IND) will be necessary to offset production costs.

*Status 1987 :* Project proposal prepared.

*Targets 1988*

1. Undertake economic study of seaweed processing in India to determine needs of industry and customers.
2. Conduct study of potential for artisanal processing or part-processing of raw seaweed.
3. Review literature on seaweed storage.
4. Determine present and potential export market for selected types of seaweed and seaweed extracts.

*Achievements*

In-depth study of Indian seaweed processing industry indicated adequate capacity to process both agar and alginate yielding seaweeds for domestic market but it is undersupplied. Shortfall met by imports of end products. Expected sellers' market has not occurred because middlemen control market prices for both suppliers and processors.

Study undertaken in the U.K., of basic processing techniques indicates agar extraction can be relatively simple process but that alginate extraction is not suitable for village-level technology. Work plan prepared for introduction and extension of village-level technology for agar extraction in Tamil Nadu. A prototype screw-press has been constructed.

Only limited information has been located.

Review of literature indicated dried *Gracilaria* would fetch good price on world market. Discussions in Thailand indicated good market there for crude agar extracted by village-level technology.

*Assessment*

Studies of the seaweed industry and the potential for artisanal processing were completed. Review of literature on storage of seaweed is ongoing. Sub-project benefited greatly from technical development in Thailand of method for village-level extraction of agar. Work plan for field testing, and extension in India, has been prepared ahead of schedule.



Targets – 1989

1. Determine main criteria for safe storage of dried *Gracilaria*.
2. Identify specific market channels for cultured *Gracilaria* and crude agar.
3. Adapt Thai agar extraction procedure to Indian conditions and train counterpart staff (in conjunction with SWD/IND).
4. Extend village-level agar extraction technology at two villages in Tamil Nadu (in conjunction with SWD/IND).

Future :

If agar production is taken up by fisherfolk they will require intensive support and assistance for several years.

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*Subproject :* Use of ice at sea in artisanal fishing boats on east coast of India (ODA/P3/IND)

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*Objectives :* Improve the quality of fish landed by fishing boats, such as navas and beach landing craft (BLCs), by demonstrating that fish can be maintained in good condition in ice in such craft and hence have the potential to sell for an increased price.

Fish iced on-board will be suitable for re-icing and onward transport to distant urban markets most of which are currently undersupplied.

*Status – 1987 :* Nil

Targets Aug to Dec 1988

Targets	Achievements
1. Confirm that ice making capacity at Kakinada is sufficient to meet needs of navas.	Confirmed.
2. Arrange construction of four prototype insulated fish boxes suitable for fitting on navas.	Only one box available during visit of consultant. The other three boxes became available in December.
3. Demonstrate use of insulated boxes at sea.	Demonstration was conducted on shore because of shortage of boxes and poor fishing at time of consultant's visit.  A local consultant was recruited to install insulated boxes, as they become available, on selected navas; arrange free supply of ice and monitor prices obtained for iced and uniced fish.

Assessment

Possibly the targets were too optimistic. However, present arrangements will enable nava owners to become familiar with use of insulated boxes and should yield useful data on performance and acceptability.

Targets 1989

1. Demonstrate use of insulated boxes at sea.
2. Demonstrate the economical viability of icing fish on-board navas.
3. Initiate similar activities at other landings on the east coast.

Future

Use of ice at sea to preserve the quality of fish is expected to become a major focus of the project.

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*Subproject :* *Collaboration with selected non-government organisations in the east coast states of India (ODA/P4/IND)*

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**Objective :** Assist NGOs to improve the handling, processing and marketing of fish at remote landings.

The target group are small-scale fisherfolk in isolated villages and landings which can best be reached through the activities and extension programmes of established NGOs. (This activity is being conducted in conjunction with NGO/IND).

**Status 1987 :** Nil

**Target – 1988**

Identify technical subject areas and locations where the project and selected NGOs in Andhra Pradesh and Tamil Nadu can work together to improve post-harvest technology.

**Achievements**

Consultant evaluated three NGOs in Andhra Pradesh and three in Tamil Nadu.

Joint activities identified were :

- i) Improve fish container
- ii) Improve curing practices
- iii) Develop cold chain
- iv) Improve data collection
- v) Train staff of NGOs

**Assessment**

There is clearly potential in working with NGOs but their lack of awareness and expertise in post-harvest matters needs to be overcome.

**Targets – 1989**

1. Conduct training courses in post-harvest activities for staff and village operatives of NGOs in Andhra Pradesh and Tamil Nadu.
2. Assist selected NGO to determine the limitations of traditional fish basket and develop an improved container.
3. Determine potential for improving fish curing practices and implementing extension programme.
4. Make contact with suitable NGOs in West Bengal and Orissa.

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*Subproject :* *Shrimp trawler by-catch off east coast of India (ODA/P5/IND)*

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**Objective :** i) Methodology for economic appraisal and assessment of volume and composition of by-catch.

ii) Evaluation of options for landing and use of by-catch.

If economic means can be found to land the by-catch it could be utilised in the national interest as food for people or animals.

**Status – 1987 :** Nil

**Targets Sept to Dec 1988**

1. Quantify by-catch discarded at sea.

**Achievements**

Consultant estimates this at 130,000 tonnes per annum.

- |   |  |
|---|--|
| 2. Determine composition of discarded by-catch.                                   | Visual estimations made during voyages on selected trawlers report expected February 1989<br><br>Arrangements to obtain frozen samples from large offshore trawlers were not successful. |
| 3. Financial and economic analysis of options for landing and utilising by-catch. | There may be potential to increase the quantity of by-catch landed in West Bengal by small collector vessels.  |

#### Assessment

The volume of fish discarded is a cause of great concern. It was believed previously that discards were in the region of 20,000 t. Trawler owners and operators are reluctant to discuss the volume and composition of discards. Their sensitivity made the study that much more difficult and possibly explains why no frozen samples of by-catch were landed for examination.

If study indicates that marine resources are being negatively affected there may be need to bring this to the notice of state governments.

This activity benefited greatly from the assistance of a SIDA-funded minor field study conducted under the auspices of the sub-project.

#### Targets – 1989

1. Monitor by-catch landed by West Bengal fishermen and obtain further information from double-rigged trawlers to give more detailed picture of the discards (quantity and composition).
2. Conduct feasibility study of potential for landing and marketing increased volumes of by-catch in West Bengal.
3. Monitor landings of fish by double rigged trawlers

#### Future

It may be possible to identify appropriate market interventions to enable smaller trawlers to land their by-catch. There may also be potential for product development in collaboration with organisations such as IFP, CIFT and MPEDA, and the private sector.

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<i>Subproject :</i>	<i>Fish marketing in east coast states of India (ODA/P6/IND)</i>
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Objective :	Propose technical improvements to marketing activities to ensure fishermen achieve greatest financial return for their catch.  Target group are small-scale fishermen who sell their catch at numerous beach landings along the east coast. Improvements to marketing may also result in improved distribution of fish to consumers in the hinterland, and a reduction in post-harvest losses.
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Status – 1987 :	Nil
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Targets May to Dec 1988 :	Achievements :
1. Undertake baseline survey of present market systems in West Bengal and Andhra Pradesh to identify areas of constraint and provide basis for further inputs.	Detailed surveys completed and draft reports prepared.
2. Monitor post-harvest activities of small kattumaram fishery in Andhra Pradesh.	Field investigator trained and installed at Kothapatnam to make daily record of handling, processing and marketing. (In conjunction with KAT/IND.)

#### Assessment

Baseline surveys were completed on schedule but there have been delays in analysing market data and finalising reports. Kattumaram study is already providing a great deal of useful information. Additional market data will result from a SIDA-financed minor field study which was undertaken in Orissa under the auspices of the subproject.

Little is known of fish marketing on the east coast and this activity may become a major focus of the project. Market forces can provide the stimulus to improvements in post-harvest practice.

#### Targets – 1989

1. Undertake baseline surveys in Orissa and Tamil Nadu to enable the compilation of preliminary market assessment for the entire east coast.
2. Identify major technical deficiencies in market system and advise central and state governments.

#### Future

Market systems are dynamic but by 1990 it is hoped to achieve an overall comprehension of the market. What follows will very much depend on the findings and the response of the relevant authorities.

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*Subproject :* *Utilisation of waste products of seafood processing industries in Sri Lanka (ODA/P1 /SRL)*

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**Objectives :** Reduce wastage from seafood processing plants by utilising by-products such as cuttlefish and squid trimmings, and prawn heads which are presently being discarded.

In the national interest it may be possible to use such material directly or indirectly for human or prawn/animal feed.

**Status 1987 :** Nil

**Targets 1988** **Achievements**

Determine the type, quantity, seasonality and availability of waste materials produced by prawn processing plants. Agreement made in October for NARA to undertake the subproject.

#### Assessment

Progress report awaited

#### Targets – 1989

1. Ascertain present utilisation or fate of such materials.
2. Determine present and future market potential.
3. Recommend means of achieving the potential.

#### Future

This activity is expected to be completed in first half of 1990.

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*Subproject :* *Processing and marketing of seaweed in Sri Lanka (ODAP2/SRL)*

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**Objectives :** Potential for improved processing, and development of domestic and international marketing.

Target group are the small-scale seaweed collectors or cultivators (SWD/SRL). Introduction of small-scale processing or improvements in market will increase financial returns.

**Status 1987 :** Nil

**Assessment :** Project proposal prepared. Awaiting identification of counterpart agency.

**Targets – 1989**

1. Determine constraints, limiting factors, and future potential of seaweed industry.
2. Determine national potential for both large and small-scale processing.
3. Identify specific domestic and export markets.
4. Initiate development of village-level processing along similar lines to ODA/P2/IND (in conjunction with SWD/SRL).

**Future**

It is envisaged that this activity will parallel that of ODA/P2/IND.

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*Subproject :* *Fisheries extension information (ODAP3/SRL)*

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**Objectives :** Package of information on use of ice for the extension service.

Target group are small-scale fisherfolk who will benefit from activities of the fisheries extension service.

**Status – 1987 :** Nil

**Assessment :** Activity agreed in principle

**Target -- 1989**

Prepare information package for use of ice to preserve fish onboard fishing vessels and during marketing.

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*Subproject :* *Fisheries Extension Development (Post-Harvest), Bangladesh (ODAP1/BGD)*

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**Objectives :** Improved utilisation of fish and greater financial return to fisherfolk communities.

Target group are small-scale fisherfolk involved in catching and processing fish in Patuakhali and Barguna districts. Objectives will be achieved by providing basic training to extension staff. (Undertaken in conjunction with EXT/FED/BGD).

**Status – 1987 :** Nil

**Assessment – 1988 :**

Project proposal submitted to Government of Bangladesh.

Target – 1989

Provide basic training in small-scale fisheries post-harvest technology for extension staff of Department of Fisheries and NGOs in Barguna and Patuakhali Districts.

Future

The awareness and interest arising from the initial training is expected to stimulate the demonstration of pilot-scale post-harvest activities in subsequent years.

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*Subproject :* *Post-harvest aspects of motorisation of Chandi boats, Bangladesh (ODAP2/BGD)*

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*Objective :* Improved marketing and thus greater financial returns from operations of motorised Chandi boats.

Target groups are owners and operators of newly motorised Chandi boats in Bhola district. Improved marketing will also benefit consumers. (Undertaken in conjunction with MCB/DEV/BGD).

*Status – 1987 :* Nil

Assessment 1988

Project proposal submitted to Government of Bangladesh.

Targets – 1989

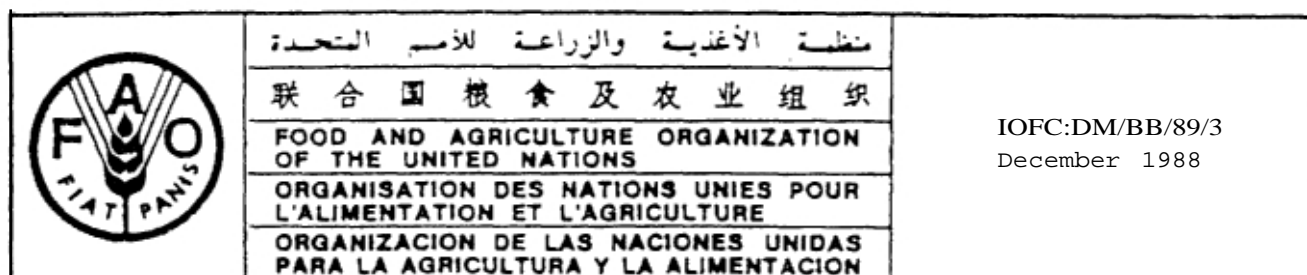
1. Appraise marketing and advise as necessary.
2. Instruct staff of Department of Fisheries in collection of market data.

Future

Modifications, changes or intervention in the marketing arrangements will depend on the advice of the marketing economist.

## ANNEXURE 1

Reproduced here is a document presented to the sixth session of the Bay of Bengal Committee (held 23-25 January in Penang, just before the 13th Advisory Committee Meeting of BOBP). The document is the BOBP's progress report for 1987-88.



Item 4 of the  
Provisional agenda                      INDIAN OCEAN FISHERY COMMISSION

COMMITTEE FOR THE DEVELOPMENT AND MANAGEMENT OF  
FISHERIES IN THE BAY OF BENGAL

### Sixth Session

Pulau                      Malaysia, 23—25 January 1989

THE BAY OF BENGAL PROGRAMME (BOBP)      PROGRESS REPORT 1987—88

#### I.      STRUCTURE

1.      The second phase of *the* Bay of Bengal Programme (BOBP) ended in 1986 on the termination of the Swedish International Development Authority (SIDA) funded small-scale fisheries project and the fishery resources management project funded by the United Nations Development Programme (UNDP).

2.      The major project of BOBP in its third phase from 1987 is "Small-Scale Fisherfolk Communities" (GCP/RAS/118/MUL) funded by the Danish International Development Agency (DANIDA) and SIDA. The Initial duration and budget are 5 years and US \$8 million respectively.

3.      A supplementary project for training activities within the scope of GCP/RAS/118/MUL has been granted by the Arab Gulf Fund for United Nations Organizations (AGFUND). The project has a budget of US\$ 400 000 and a duration of three years. It was approved in mid-1988 and is expected to become operational in 1989 after endorsement by at least five of the participating countries. The title of the project is "Training for Small-Scale Fisherfolk Communities" (GCP/RAS/126/AGF).

4.      A project for Post-Harvest Fisheries commenced mid-1987. It is funded and executed by the Overseas Development Administration (ODA) of the United Kingdom (UK). Initially it has been approved for two years with a budget of about US\$ 450 000.

5.      A fishery resources oriented project on bio-economics of fisheries, proposed at the Fifth Session of the Committee, has not yet materialized. A proposal has been forwarded to UNDP where it is being considered, and to the member countries, out of which all but two have endorsed it. Pending its approval, BOBP's competence in fishery resources is retained through GCP/RAS/118/MUL on the recommendation of the Advisory Committee.

6. Three national fishery resources Oriented FAO project have been Implemented through the BOBP during 1987-88. Two of them, funded under FAO's Technical Cooperation Programme (TCP), concern Exploratory Fishing for Tuna with small boats in the EEZs of the Maldives and Sri Lanka. The third one deals with Reef Fishery Research and Resources Survey in the Maldives and is funded by UNDP. The Latter is likely to be succeeded by a similar follow-up project during 1989-90. A fourth project for small fishing craft development in Kerala, India, also funded by FAO's TCP, has been approved recently. It will become operational *early* in 1989.

7. Another national project in India, of a completely different nature, was brought under BOBP's umbrella in 1988. It is a pilot project to make a fishery harbunr cleaner by providing garbage bins and facilities for collecting and disposing of oily residues from fishing boats and by anti-pollution promotion through videos, posters and **leaflets**. The fishery harbour in Visakhapatnam was chosen **for the pilot** project which is one element of the Inter national Maritime Organization (IMO) pollution programme funded by SIDA.

## II. ELEMENTS OF THE BAY OF BENGAL PROGRAMME (BOB??)

8. The content of the Programme is organized into six major disciplines under which project activities and sub-projects are being undertaken. Common for all disciplines, or rather serving them, is an Information Service. Most of the sub-projects started during 1982 -83 but a few are continuations from the earlier project (GCP/RAS/040/SWE). The new phase of the Programme with new projects has somewhat changed its character. More emphasis is laid on the fishing community as target group thus making the work more **multidisciplinary**.

### (i) Extension

9. The work programme under Extension contains two integrated extension sub-projects - in Ranong Province, Thailand, and in Langkat district, North Sumatra, Indonesia. The Ranong project aims at improved extension service in general and concerns all aspects of fishing community development. The project in Langkat **on** the other hand focuses on income generating activities.

10. Two other sub-projects have the main aim of creating a suitable extension service by training extension officers and extension workers. The sub-project in Maldives is starting more or less from scratch, creating an entirely new extension unit . In Bangladesh, an in-service training scheme is planned for two of the coastal districts as a pilot project. Both training schemes emphasize in-service training, and the intention is that they will contain concrete extension activities in both technical subjects and social services and facilities.

11. In India, an attempt is being made to improve and expand **extension** activities by engaging NGOs in cooperation with the existing extension services of the State Departments of Fisheries. Activities envisaged are different **types** of training courses for NGO staff at different **levels** and technical support for specific experiments and trials concerning fishing technology (boats and gear), post-harvest technology or **aquaculture**. The purpose is not to reach a certain number of people in the target group but to explore the possibilities of cooperating with NGOs in an extension system.

12. An interesting experiment is being undertaken in Sri Lanka by establishing a fisherfolk radio programme in cooperation with the Ministry of Fisheries and the Sri Lanka Broadcasting Corporation. Initially the programme



plans short daily transmissions about the weather, fish prices and fisheries events. On certain days, longer features will be broadcasted; including interviews with fisherfolk and others concerned with fisheries. The programme will also be used as an extension tool for technology and methodology transfer. Another sub-project in Sri Lanka is a credit scheme for small-scale fisherfolk, similar in design to the one operated by BOBP earlier in Orissa, India.

13. The major difference in extension work between present and previous phases of BOBP is the introduction of extension projects over a wider geographical area (rather than efforts in a particular village). Non-formal education does not feature any longer in the programme, but the work undertaken earlier in primary and adult education is being promoted.

(ii) Brackishwater Culture

14. Coastal aquaculture work in the previous phases concentrated heavily on shrimps with pilot projects for pond culture in Malaysia, Bangladesh and India, pen culture in India and a shrimp hatchery in Sri Lanka. Pen culture trials have continued in the new phase because of its attractiveness to small-scale operators. The culture of shrimp in ponds, however, has been completely discontinued since it does not seem to be accessible to small-scale operators. Intensive culture needs capital, organization and management skills while extensive culture requires large areas, neither of which available with the small-scale fisherfolk.

15. New activities which have been taken up include Oyster Culture in Malaysia; the technology is relatively simple and no large investments are required. It is however, not free from technical problems. A quantitatively sufficient and predictable source of seed must be assured. Post-harvest problems concern primarily handling, preservation and sanitation. Oyster culture is also a major subactivity of the extension project in Ranong.

16. Seaweed culture is eminently suitable for small-scale operators. Two pilot farms are being established in Mandapam, Tamil Nadu, India and Puttalam, Sri Lanka. The techniques used are based on the experiences with *Gracilaria* culture in Malaysia under earlier BOBP work. The progress of trials in Mandapam and Puttalam is not entirely positive. Problems are being encountered with both the spore setting and predation during the grow out. The subject is of interest to all BOBP countries.

17. During the shrimp culture trials in Satkhira, Bangladesh, 1982-85, it was found that a very large number of people were engaged in collecting prawn seed for the many extensive farms being established in that area. Later, in 1987, further details about **this** sub-sector were collected in Bangladesh (Satkhira Khulna and in the Chittagong/Cox's Bazar region). While seed collection is a very important occupation for tens of thousands of people, it is also a very damaging activity so far as conservation of fish resources is concerned. Only a fraction of the catch is retained during collection, while the bulk is left to die on the shores. That bulk contains seed of shrimp other than *P. monodon* and considerable quantities of juvenile fish of commercially valuable species. The situation is similar in large areas of West Bengal. The entire issue of prawn seed supply, including production in hatcheries, is therefore being looked into in both Bangladesh and West Bengal.

(iii) Fishing Technology

18. Major work in this discipline has been undertaken under two sub-projects continued from GCP/RAS/040/SWE. One concerns beachlanding craft introduction

in India which is well under way in Andhra Pradesh and Orissa. The basic technical development work was terminated a long time ago, and the thrust is now on demonstration and extension work primarily in the areas of engine maintenance and repair and demonstration of offshore fishing. It is felt that BOBP should continue its engagement in this sub-project for another couple of years. Experiences from the development of beach-hauling devices are being used for testing and demonstrating such devices in the Maldives.

19. The other sub-project concerns fishing boat development in Sri Lanka, which is just about to be terminated. The major contribution has been the development of a small-scale offshore fishing boat for fishing of large pelagic species. The main features of the craft are a low-powered engine, insulated fishhold for fish preservation and decent crew accommodation, allowing the boat to stay out for up to 5-6 days, as far as 120 n miles from the base. This offshore fishery is a recent phenomenon which has developed over the last couple of years. Although many factors have contributed to it, it is believed that BOBP's work is one of the important ones.

20. Another sub-project in Sri Lanka concerns the development of new types of outrigger canoes to replace the existing ones dug out of high value logs. Other modern craft are possible alternatives but the outrigger concept is being promoted because the smaller engines sufficient for the slender hulls of canoes are fuel-savers. New types of outrigger canoes are similarly being promoted and developed in North Sumatra and Nias Island on the West Coast.

21. There has also been considerable fishing technology input into the resource-oriented projects in Maldives and Sri Lanka concerning Tuna and Reef Fish which are commented upon below under Fishery Resources. The input relates mainly to the provision of fishing equipment, installation of gear and equipment, deck arrangements, fishing demonstration and training of crew.

#### (iv) Fishery Resources

22. Two of the most important small-scale fisheries in the region - in terms of production and the number of people depending on them - have been taken up for intensive study. They are the Rattumaram fisheries of the Lower east coast of India and the Set Bagnet fisheries of Bangladesh. The productivity of both fisheries is very low, and the fisherfolk concerned are among the poorest, with almost no possibility of doing anything else. Both fisheries were looked into by BOBP during its previous phase, but from a technological point of view. While no progress was made with Kattumarams, some improvements were achieved with the Set Bagnets used on the outer islands during the winter season. Studies now taken up have a one-year duration. The Kattumaram fishery study will be limited to one particular area in southern Andhra Pradesh with occasional studies of another village in the northern part of the same state. The Set Bagnet study will be undertaken in about six locations to cover possible ecological differences in the Bangladesh estuarine area. The studies are not limited to resources but will cover all other aspects: catch, preservation, marketing and socio-economics. The hope is that these studies will show where further inputs can be channelled to assist the fisheries in their survival and development.

23. Another major effort within the resources discipline has been the implementation of the two exploratory tuna fishing projects in Maldives and Sri Lanka and the reef fish research and resource survey project in the Maldives. The tuna project in Sri Lanka has been quite successful, with a systematic coverage of the west coast of Sri Lanka over nearly a two year period. The corresponding project in Maldives has for various reasons

encountered numerous operational problems, and the quantity of data obtained is much less than in Sri Lanka. The reef fishery project in the Maldives has produced impressive volumes of data which will help determine the potential for reef fisheries development. With the aim of obtaining countrywide estimates of fish availability and potential yields, the project is likely to be followed up by a new two-year exercise which will explore atolls in other parts of the country.

(v) Post Harvest Technology

24. The discipline of Post-Harvest Technology was added to the programme in the middle of 1987 through the new ODA project. While the project is a separate entity within BOBP, it is technically fully integrated with the other disciplines of the Programme.

25. One of the major activities in progress concerns prawn feed. This was prompted by BOBP's frustration in not being able to obtain suitable feed for the pen culture trials in South India. The issue is now under comprehensive study both in range and depth and should be of interest to all prawn farming countries in the region. A detailed review has been made of the plants, equipment, raw material etc. available in India, and this is being studied by technical and economic experts. The expected outcome is a set of policy recommendations to governments, MPEDA and other institutions concerned. It will also contain concrete proposals for manufacturing prawn feed on an experimental basis with trials for monitoring feeding results. Further technical or financial input to such pilot exercises will also be considered.

26. Another activity - which concerns the processing and marketing of seaweed - has been fully integrated with the culture trials mentioned above in Mandapam (India). A review of the processing and marketing establishments in India has been made; the next step is trial marketing of cultured seaweed in India and abroad and, even more interestingly, local production of Gracilaria agar close to the production sites.

27. A major activity in the years to come may be to promote the use of ice, particularly on board fishing boats. A start has been made in Kakinada, Andhra Pradesh, India by installing insulated boxes in the Navas. These boats, which are of the traditional type, have recently been motorized - an offshoot of BOBP beachlanding craft development - and are venturing further offshore and stay longer at sea. Some of the catches are of very poor quality when they reach the beaches, and the economy of the fishery can probably be considerably improved by better fish preservation.

28. Another activity taken up recently, marketing studies in the east coast states of India, may lead to specific post harvest improvements in due course. A comprehensive study of industrial shrimp trawler by-catch along the upper east coast of India has also been initiated. The study aims at determining economic options for landing shrimp trawler by-catch. Investigations are being undertaken to define and quantify the problem and obtain facts on number and types of boats, different species, landing sites, alternative uses, etc. Trawler by catch is another issue of regional interest.

29. Most of the post-harvest fisheries work initiated so far has been carried out in India, **but** discussions on various topics have been held in Bangladesh, Sri Lanka and the Maldives. These should lead to action in the coming year.

(vi) Development Support

30. The discipline of Development Support concerns preparation of project proposals, promotion of successful BOBP projects and of small-scale fisheries development in general. BOBP's earlier work led to project proposals for non-formal education in Orissa and Tamil Nadu, women link worker training in Tamil Nadu, motorization of Chandi boats in Bangladesh and offshore small-scale pelagic fisheries development in India. Efforts have been made to secure progress on these proposals but with very little success. The project on non-formal education in Orissa and the Chandi boat motorization in Bangladesh have been kept going with bridging support from the Programme.

31. BOBP has had hardly any input to West Bengal in the past. In addition to the brackishwater culture activities, a major effort will be made to assist the State in crystallizing problems and needs and preparing project proposals to improve the fisheries and the fishing communities.

32. The subject of pollution has been mentioned many times in connection with BOBP's work. Its effects on the fisheries of the region are largely unknown. There are clear signs of increased **pollution** and of general deterioration of the coastal environment, particularly in lagoons and backwaters, but how much does this affect the fisheries? To make a preliminary assessment, initially in Bangladesh, India and Sri Lanka, cooperation has been established with the National Swedish Board of Fisheries. A consultant visited the area in October/December 1988.

33. Finally, as a response to the recommendation of the Advisory Committee at its 12th meeting, assistance has been provided to Sri Lanka to investigate the possibility of improving fishermen's safety at sea, bettering alertness and upgrading the efficiency of search and rescue operations. Although the study has been limited to Sri Lanka, its findings will probably be valid for other small-scale offshore fisheries in the region as well.

### III. INFORMATION SERVICE

34. The BOBP's Information Service plays a vital role in promotion, both of BOBP work and of small-scale fisheries. The popular Newsletter, Bay of Bengal News, has maintained uninterrupted publication for nearly eight years. The Programme is now also active in video. An experienced videographer has been engaged for a year; important BOBP activities are to be recorded on video in the form of complete films and clips. It is expected that this record will be useful for reference, also for training, and for stimulating debate and discussion.

35. A subregional (Maldives, Sri Lanka, India, Bangladesh) consultation on Fisheries Information was held recently to encourage a more systematic exchange of fisheries information within the region. BOBP's purpose is to stimulate the establishment of a network.

#### IV. ACHIEVEMENTS

36. since most of the activities of the Programme have been undertaken in 1987 and 1988, it is too early to expect significant results. One may at best note good progress or achievement of certain targets which eventually may lead to positive results and impact. Before commenting further on such achievements it is worth noting that some of the activities continuing from GCP/RAS/040/SWE are generating impact.

37. Beachlanding craft (BLC) introduction in India has contributed to increased landings, tapping of hitherto underexploited resources, improved incomes for fishermen, new and better boatbuilding practices, opening of new fish marketing channels and accelerated rate of motorization of country craft. It has helped identify an under-exploited resource of high potential (flying fish) in Tamil Nadu. It must be noted, however, that BLCs do not work well everywhere, and they are not the universal answer to beach-based fisheries.

38. BOBP's fishing boat development in Sri Lanka has also in a significant way contributed to the development of an efficient and specialized driftnet-cum-longline offshore fishery for large pelagic species (billfish, shark and tuna) by small fishing boats. A third example of impact is visible in Bangladesh where the Hilsa fishing Chandi boats are being motorized with and without assistance from the Programme. Both these activities have led to considerably increased incomes for the fishermen concerned.

39. One of the achievements is the outcome of the work on People's Participation (PEP), initiated by an intensive study during 1986-87. The follow-up work consists of the preparation of a comprehensive report with specific case studies which will be a valuable reference document for future work. Efforts are also being made to prepare guidelines for Rapid Rural Assessment (RRA) in fishing communities. These activities are expected to be completed early 1989.

40. The FAO/TCP project for Exploratory Tuna Fishing in Sri Lanka has by any standard been a well-implemented project, primarily due to the dedicated input from the staff of the National Aquatic Resources Agency (NARA). The fishing boat has been at sea for about 15 days per month over 2 years. The entire west coast of Sri Lanka has systematically been covered during this period up to about 100 n miles offshore. Very valuable data on catch rates in different areas and during different times of the year have been collected, which will help to better understand the resources picture. Operational experience has also been gained. Thanks to work on this project, and BOBP experience with Fishing Boat Development mentioned earlier, well-researched recommendations for future development of the small-scale offshore fishery in Sri Lanka can be made. The sister project in Maldives has been less successful because of operational problems, but joint analysis of the results of the two projects will hopefully lead to better information about the common stocks exploited by both countries.

41. The UNDP-funded Reef Fishery Project in Maldives has also been implemented with a high degree of efficiency. New and interesting data have been obtained on reef fish in the Male Atoll. Despite this, the project must be considered as a pilot exercise and a follow-up project has therefore been requested by the Government of Maldives and agreed to by UNDP. It will start in 1989 for a duration of two years.

42. Some other BOBP activities, such as prawn feed work initiated in India, show good progress but It is too early to predict the outcome.

## V. PROBLEM AREAS

43. BOBP started with experiments to culture shrimp in pens at Killai, Tamil Nadu, in 1982. The pilot project was terminated in 1987 with the conclusion that pen culture at that site was not viable. One of the reasons for the failure was site selection but other factors such as management and poor participation of the neighbouring communities contributed to the failure. Meanwhile, trials had also been taken up in Sri Lanka. These are still ongoing.

44. It now seems that, despite all the attractive features of pen culture as far as small-scale operators are concerned, the technology is not suitable and certainly is not for wider application. One of the major problems is the lack of control over environmental factors, salinity being the most important; there are also problems in controlling the predators inside the pens; management including stocking, feeding, harvesting, etc. are fairly complicated operations: the pens are vulnerable to various hazards - accidental and manmade.

45. Site specificity is a characteristic not **just** of pen culture, but of all brackishwater culture practices. Success in one place does not guarantee that it can be repeated in others and vice-versa. To establish feasibility and generate impact, lengthy trials appear to be needed in many places due to environmental variations. In general, therefore, the potential for wide application on a regional basis of various brackishwater culture practices seems to be limited. A further limiting factor is the lack of demand for some products in some areas, such as for molluscs along the entire upper and eastern part of the Bay.

46. Another problem area concerns the integrated extension projects now being attempted in Ranong and Medan. These are fairly open-ended projects, and the activities will depend a lot on the wishes and ambitions of the fisherfolk and their own participation in the development work. Furthermore, active participation is required not only of the fisheries authorities but of various other departments - health, community development, extension, etc. - and good cooperation among them.

47. Because of these factors, the starting up phase of such projects is usually a very prolonged one. It is also foreseen that the implementation phase will be long and cumbersome. Problems to be solved will usually be relevant to that pilot project, and any solutions or methods may be of little value for replication in other places. It might be that teething problems have influenced the thinking too much at this stage, but the matter certainly arouses concern and should be looked into by the Review Mission of GPC/RAS/118/MUL. The alternative to integrated extension projects would be inputs like credit, education, training, etc, which were major activities in the previous phases of BOBP, or like the radio programme now being attempted in Sri Lanka. The **ultimate** goal is, of course, integrated development but is discussed here in the context of a regional project or programme.

48. The Programme has also encountered some initial problems in starting new sub-projects. The issue of Government cash contributions was not resolved in some of the countries until 1988, and administrative procedures for clearing activities delayed the work in some countries. Maldives and Indonesia are new to the small-scale fisherfolk project and time and effort were needed to establish suitable working arrangements. Finally, there were delays in recruiting international staff and it was only in the second half of 1988 that

the Programme became fully staffed. All these problems are now more or less overcome and should not affect implementation of activities during the coming years.

(vi) APPRAISAL

49. The most pertinent question in an appraisal would be to what extent the Programme meets the needs of the region.

50. In quantitative terms, the BOBP's contribution is insignificant. This should be obvious, but needs to be stressed since BOBP is often mentioned together with major donors and development cooperation agencies. It is perhaps only in the Maldives that BOBP has achieved a saturation level in fishery resources management, thanks to the national reef fish and tuna projects and the 'cooperation with ODA.

51. As far as methodological and technological developments go, the Programme could fulfil the needs much better with more resources at its disposal. For example, on the basis of experience with beach-landing craft introduction in India, offshore fisheries in Sri Lanka, and available resources information, it is felt that good potential exists for offshore small-scale pelagic fishing in India. However, the inputs required to demonstrate this are too large to allocate to one country from the regional budget. A project proposal therefore had to be prepared for a supplementary national project. The national clearance procedure for such a project in any country is at least one year and in a country like India with state and federal governments much longer. After that comes the consideration by interested donor(s) : again a minimum of one year. In total, it will take at least three years before such a project can materialize. If resources had been easily available, the project could have been implemented by BOBP itself, obviating the need for time consuming procedures. There are several such examples of new development and demonstration projects and expanded pilot activities. Timely implementation would dramatically increase the impact of BOBP.

52. It is felt that in qualitative terms the Programme's work addresses well the needs of the countries and of their fisherfolk. All activities and sub-projects enjoy unqualified support from governments and other cooperating agencies. The work of the Programme - not the international staff alone but the BOBP as a whole, a joint venture between international and national agencies and their staff - is believed to be of a high calibre.

53. The Programme's workscope shows a big gap in the area of fishery resources in the absence of the proposed project on bio-economics. The stopgap solution of maintaining fishery resources competence under GCP/RS/118/MUL helps to make the Programme more complete. At the same time, it also dilutes GPC/RAS/118/MUL since money meant for other disciplines is diverted to fishery resources.

54. In brackishwater culture the various culture techniques are felt to be adequately covered by the Programme. However, many other important matters concerning the planning of brackishwater culture development such as: equitable land allocation to different sectors of society; conflicts between various users of backwaters, lagoons and mangroves, types of culture - intensive or extensive, etc. also need attention. These are national concerns of course, but the principles behind them are common for all countries and could perhaps to a certain extent be tackled through a regional programme.

55. Pollution is a matter of growing concern in the area. Certain areas are already heavily polluted, and the need for remedial measures is obvious. But there is also a less visible but steady deterioration of coastal areas, primarily affecting the lagoon and backwater fisheries, a traditional occupation of the poorest of people. This deterioration will also hit aquaculture development. A preliminary assessment of these factors is being undertaken at present. Further investigations seem desirable, but whether they are to be done on a national basis or in the context of a regional project/programme remains to be discussed,

56. Two other subjects, at times suggested for coverage by BOBP, are Nutrition and Communication Techniques. The former would primarily introduce/strengthen nutrition concerns in small-scale fisheries development and devise ways and means to improve the nutritional status of fisherfolk. The latter would be an expansion of the Information Service or a combined effort of the Extension Unit and Information Service. The rationale behind it is that sound fisheries development requires more people's participation, which cannot be achieved without better communication techniques with the people.

57. Some activities undertaken by the Programme are of interest to all countries - such as those concerning culture, and the processing and marketing of seaweed (*Gracilaria*). Others are of potential interest, such as the radio programme in Sri Lanka. Matters related to resources assessment and management may also interest all countries although the species and other features may vary. Extension activities might be specific for a country or an area but the methods of organization and implementation command wide interest. This also applies to post-harvest technology but the priorities differ. It is only in a few areas e.g. oyster culture (in Malaysia and Thailand) and beachlanding craft (in India and Sri Lanka) that interest is limited to a subregional level. Ways and means to stimulate regional cooperation are continuously being sought but further ideas are solicited. An effort to identify technical activities in some countries which can be directly transferred to other countries from one target group to another, has been undertaken recently.

58. BOBP is not a permanent institution but composed of fixed-term projects. GCP/RAS/118/MUL is planned for three more years and it is hoped that it will be supplemented during this period by the ODA Post Harvest Fishery project, and perhaps also a UNDP bio-economics project. It is now already clear that due to the initial delays mentioned earlier in this paper, and the absence of the resources project, the Programme will achieve less than anticipated earlier. Many activities would have to be continued for a longer period to bear fruit. There is also a definite need for technical assistance and for stimulating regional cooperation on a long-term basis. This could of course be continued under BOBP but it could also be done under other regional organizations or bodies already established on a more permanent footing in the region. Whatever option is preferred, early thought should be given to this **issue** so that the facilities established by BOBP and the development momentum generated are not lost - which would mean a setback for small-scale fisheries in the region.

#### SUGGESTED ACTION BY THE COMMITTEE


59. The Committee is invited to comment on the issues raised in the paper and particularly those appearing in the appraisal section and offer advice it deems appropriate concerning:



- the funding constraint of the programme itself and the lengthy procedures for obtaining additional funds for expanded demonstrations or pilot operation of successful work - paragraphs 51-52.
- the urgent need for the execution of the proposed project on bioeconomics - paragraph 53.
- the desirability and possibility of expanding the scope of BOBP to cover brackishwater culture planning, pollution, nutrition, communication techniques as separate disciplines - paragraphs 54-57.
- efforts to stimulate and increase regional cooperation - paragraph 58.
- consideration of the future of BOBP beyond the present projects - paragraphs 58.

## ANNEXURE 2

Reproduced here is a document presented to the sixth session of the Bay of Bengal Committee (held 23-25 January in Penang, just before the 13th Advisory Committee Meeting of BOBP). The document describes critical issues for fisheries development in the Bay of Bengal region.

	منظمة الأغذية والزراعة للأمم المتحدة	IOFC :DM/BB/89/4 December 1988
	联合国粮食及农业组织	
	FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS	
	ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE	
	ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACION	

Item 5 of the  
Provisional Agenda

INDIAN OCEAN FISHERY COMMISSION

COMMITTEE FOR THE DEVELOPMENT AND MANAGEMENT OF FISHERIES  
IN THE BAY OF BENGAL

Sixth Session

Pulau Pinang, Malaysia, 23-25 January 1989

CRITICAL ISSUES FOR FISHERIES DEVELOPMENT IN THE  
BAY OF BENGAL REGION

### INTRODUCTION:

1. In the countries bordering the Bay of Bengal, the fishery sector displays the same dual characteristics as the rest of the economy. Parallel to an export-oriented commercial sector, there is a large traditional fishery in which fisherfolk living at a subsistence level are engaged. After briefly dealing with the characteristics of the fisheries and significant developments in recent years, this paper addresses the development issues of principal areas, namely marine capture fishery, coastal aquaculture, extension, welfare and infrastructure, with particular emphasis on the small-scale sector and suggests various action points to improve production and socio-economic conditions of the target group.

### CHARACTERISTICS OF FISHERIES

#### Production

2. The annual marine fish production in the area covered by the Bay of Bengal Programme (BOBP) is about 1.9 million tons of which about 33% is contributed by the traditional non-motorized fishery. India produces over 500 000 t and while the production from the Maldives is about 60 000 t. production in Thailand, Malaysia and Indonesia (Malacca Straits Sumatra) is in the region of 300 000 t each, and in Bangladesh and Sri Lanka about 190 000 t and 140 000 t respectively.

3. By virtue of a comparatively short coastline, Bangladesh records fairly high landings (390 t) per km of coastline but because of dense population of fishermen, the annual per capita production is the lowest, 1.2 t. The countries bordering the eastern seaboard of the Bay of Bengal produce

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250-400 t per km length of coastline (the lower of the range in Indonesia and the higher in Thailand), while the corresponding figures on the western side, in India and Sri Lanka, are 170 t and 80 t respectively. The annual per capita production of fishermen is fairly high in Thailand and Malaysia (8-9 t), whereas in the other countries, except Bangladesh, it is 2-3 t. Thus the per capita production is more or less inversely related to the number of fishermen. The largest returns from one sq km of shelf area is off Malaysia (7 t) and Thailand, Indonesia and Sri Lanka (5-6 t); the lowest are in India and Bangladesh (3-4 t). A comparative picture of the above features in the member countries of BOBP is shown in Annex 1.

4. Information on production from culture fisheries with specific reference to the project area is hard to come by. On the western coast of Thailand and in Peninsular Malaysia (both west and east), the major activity is culture of blood cockles to produce about 7 500 t and 45000 t respectively. The other varieties cultured in a small/modest way are sea perches, flat oysters, penaeid prawns and non-penaeid prawns, the production of which, along with some others, amounts to about 400 t and 560 t in the respective countries.

5. In the Maldives, the motorized sector accounts for about 90% of the production; in Sri Lanka and Bangladesh, it is about 65%, in India about 45% and in Indonesia about 33%. In Thailand and Malaysia, practically the entire production comes from powered boats.

#### Catch Composition

6. While in the Maldives an overwhelmingly large percentage of catch comes from the pelagic realm, the position differs in the other countries. The share of the pelagics is around 40-50% of the catch in Sri Lanka, India and Bangladesh. The picture changes in the Thailand, Malaysia and Indonesia sector, where the trash/miscellaneous fish form 40-60% of the catches. In Thailand and Malaysia the trash fish forms 46% and 30% respectively; in Indonesia, it is the "miscellaneous" fish (37%) which accounts for such high proportion.

7. **Malaysia** is the largest producer of penaeid prawns and Indonesia of non-penaeid prawns, with India following these countries in both these resources.

	Pelagic fishes	Demersal fishes	Other fishes	Shell fishes	Other aquatic animals
	( percentage)				
Maldives	87	7	13		
Sri Lanka	43	19	25	3	
India	49	31	9	11	
Bangladesh	37	?	56	7	
Thailand	5	6	50	12	27
Malaysia	11	10	57	21	
Indonesia	32	9	37	22	

#### Recent Significant Developments

8. Maldives: Sudden increase in fish production since 1984; concurrent increase in the number and fishing effort of motorized pole and line fishing vessels and corresponding decline in non-motorized boats; imposition of a fishing rule in 1983 whereby motorized operators employing their boats for less than 180 fishing days are liable with certain tax; permission for net fishing.

9. Sri Lanka: Emergence of a multi-day offshore (up to 120 n miles) pelagic fishery for tunas, billfishes and sharks principally with the existing fleet of 32-38 feet long boats.

10. India: Gradual progress in inboard motorization especially of the traditional Nava and Vallam boats; introduction of BOBP-designed beach landing crafts with government subsidy; conversion of the conventional shrimp trawl of small motorized trawlers into high-opening shrimp cum fish trawl with progressive reduction in the cod-end mesh size; entry of intermediate 14-16 m long mini-trawlers in the industrial shrimp fishery.

11. Bangladesh : Rapid expansion of the brackishwater culture (tiger prawns) with support from the World Bank and the Asian Development Bank.

12. Thailand: Establishment of a large number of backyard hatcheries for penaeid prawns; gradual development of mackerel purse seine for tunas; increasing demand for trash fish to feed sea perches, groupers and prawns under culture.

13. Indonesia: Conversion of mini-trawl fishery into multi-day handline fishery and of one-day purse seine fishery in the northern part into multi-day fishery including night fishing with light attraction; completion of infrastructure shore facilities on the west coast of North Sumatra and introduction of a few purse seiners in that area.

#### DEVELOPMENT ISSUES

##### Marine Capture Fishery

14. Modernization and modification of fishing crafts and gear have helped augment fish production to such an extent that there are very few underexploited inshore resources left. Although monitoring of resources is not done with any serious concern, there are indications that in most countries the main resources of inshore areas are being exploited at the upper limit of sustainable yield. Fish price in the urban market is increasing, but the income of small-scale fishermen has not increased proportionately because of shrinking returns per unit of effort. They have a hard time competing for the same limited resources among themselves and with large scale operators of motorized crafts.

15. While some enterprising fishermen did benefit from modernization/mechanization of crafts and have graduated to a higher income group, it is mainly the non-fishermen entrepreneurs who contributed to, and took advantage of, the pace of fisheries development. Taking into consideration the resource information and the recent significant developments, the questions that arise are :

- Is there scope for development of demersal fisheries for the small-scale sector in the Maldives and Sri Lanka?
- Is there scope for development of offshore pelagics on the east coast of India?
- Is not the trawling becoming increasingly injurious to the inshore fishery resources of the east coast of India?
- Is not this question all the more crucial to West Bengal and Bangladesh as it is compounded with set bagnet operations in the estuaries and

inshore waters? And again in the case of Indonesia with a multitude of passive and active gear?

- What is the status of exploitation on the demersal fisheries in Indonesia after the ban on trawling. Do the reported miscellaneous fishes belong mostly to small demersals?
- How is the trash fish utilized in Malaysia? Is its utilization or capture a big concern there unlike in Thailand?
- What do we know about the by-catch - its species composition, its utilization, scope for adding value, etc.?
- Is there scope for increasing the productivity per unit area of shelf waters in India and Bangladesh at least to a level of 5 t? If so, can the small-scale sector participate in this venture?

16. These are only an indicative list of questions that revolve round i) resource characteristics, ii) resource enhancement and iii) resource management.

#### Resource characteristics

17. To have a clearer, more complete and more appreciable picture of the resources, a good data base is essential, a data base of catch and effort spatially and temporally, gear-wise, sector-wise, major species-wise. Where such a data collection system exists, it has to be intensified/expanded and the results publicized; where such a system exists in a modest way, it has to be improved; where such a system is in its infancy, it has to be strengthened.

#### Resource enhancement

18. Trial fishing/commercial feasibility studies which would focus on specific resources seems to be a more effective means of ascertaining the possibility/profitability of establishing/exploiting the new type of fisheries than general resources surveys. Employment of FADS can be explored. Development of such fisheries/technologies intervention should also take into account its possible impact on the existing fisheries, especially of the traditional sector.

#### Resource management

19. Certainly an oft-repeated cliché, nonetheless the problem of resource management remains helplessly unattended. The main reasons are too many recommendations, classic and conventional, unrealistic, and unenforceable, and lack of appropriate support mechanism for implementation. Identification of the barest minimum number of measures - the most specific, practical and enforceable - is the first need. The second is arousing the awareness of the fishermen of the consequences of lack of management of resources, making them responsible for recommending management measures, which do not vehemently conflict with the interests of different sectors, for monitoring compliance, and for resolving any disputes.

20. A planned programme of training of scientists for gradual upgrading of their knowledge and skill in stock assessment and related studies and their continued availability in the discipline is necessary. A judicious synthesis of biological and statistical knowledge will be more rewarding than the conventional classroom technique of imparting knowledge which is seldom found ploughed back after the training.

## Coastal Aquaculture

### Conflicting land and water uses:

21. Improved culture practices and the demand for their produce have brought under pressure the age long balance between different water and land uses. In the lagoons and at sea, cage culture or pen culture can interfere with free navigation and capture fishery. The same conflict arises in tidal flats where molluscs are produced. Traditionally there was a paddy cum pisciculture rotation, but in Bangladesh this rotation tends to be replaced by a year round production of shrimps for export market. However, in West Bengal, such monoculture is not permitted in the existing paddy cum pisciculture areas in order to meet domestic demand for rice as well as fish.

22. Where mangrove forests have been destroyed for the construction of ponds, it has affected the source of fuel for local communities. Destruction of these natural nurseries has a far reaching impact on the recruitment to the stock of many capture fisheries.

23. While expanding production areas, expenditure involved on mangrove forest cutting and distumping can be saved if ponds are established farther from the coast.

24. Those who destroy the mangroves for starting aquaculture operations do not usually belong to the target group. Furthermore, in shrimp culture big operators tend to displace smaller ones. Development of aquaculture has usually an adverse impact on existing small-scale capture fishery of lagoons and other backwaters. Social feasibility studies should be included at the planning stage by the decision making bodies while considering establishment of aquaculture schemes.

25. In the light of above, therefore, the government should enunciate a clear and firm policy on the rational utilization of land for agriculture and aquaculture, the type of culture practices - extensive, semi-intensive, intensive - to be promoted; and allocation of land areas for each type, striking a technological, ecological, economic and sociological balance.

### Seed

26. Whether it is extensive or semi-intensive culture, supply of seed is mostly from the wild stock. While selecting the seeds of candidate species, the other seeds get destroyed, thus affecting the recruitment of other species to the fishery. With the adoption of more advanced culture methods, the burden on the natural stock of shrimp seed will increase unless hatcheries are set up.

The principal issues therefore are:

- Quantification of seed availability and seed demand;
- Establishment of hatcheries - the need, the type (backyard/medium or large scale) and the quantity to be produced;
- Seed collection management - an appraisal of current practices, human resources involved, the quantity produced/destroyed and management measures required.

### Feed

27. A major component of shrimp feed is fish. The low-value fish, that goes into compounding of shrimp feed, is also in demand for poultry feed.

Countries which do not have the local capacity to manufacture feed, import it at a high cost. If they want to boost up production, import is likely to continue in the medium term because to sustain a local quality feed, production takes time. It also generates a very damaging type of marine resources fishing. This consideration should influence planning of shrimp culture development and the technological choice in cultivation method.

#### Environmental hazard and public health

28. Deforestation related to the lack of upland management has been leading to siltation in oyster parks in Thailand.

29. Wastes and chemicals from domestic, industrial or agricultural sources affect water quality and in turn have an adverse effect on aquaculture in terms of both yield and quality of the product; e.g., the public resistance affecting the marketability of cockles and oysters in Malaysia and Thailand.

30. Spread of diseases may be due to environmental pollution or to certain constituents in the feed reducing the resistance of the species against diseases. When the diseases become widespread, they can cause real havoc to the whole crop throughout the country, as happened recently in Taiwan.

31. Field investigations are required to document the causes of damage/loss and to quantify them.

#### Training

32. Operators employ mostly the traditional and less efficient methods; to ensure better yield and to minimize destruction of unwanted seed, they need training on improved technology of the entire operations from seed collection to harvesting.

#### Extension

33. Although it is generally recognized that extension workers should overcome attitudinal and socio-economic barriers in fishermen communities, very little has been done to create an organized extension service. Funding and training are additional major constraints to motivation among officials. Again, the low visibility of extension has made development support to this component politically less attractive than infrastructure-packed schemes.

34. Since a classical approach in the design of the extension service seems financially not feasible, other areas have to be explored.

- Officials now burdened with a multiplicity of duties will have to be relieved at least to some extent and are given training to update their skills and abilities.
- Organization of a fisheries information system through radio broadcasts on technology and market situation.
- Involvement of fisherwomen in extension as link workers to cater to domestic and community needs.
- For the ultimate goal' of self reliance, greater effort to communicate with the fishing communities for:
  - identifying their needs in technological, social, economic and cultural areas;

- effective transfer of technology and information;
- involving them in project/state plan implementation;
- raising their awareness on the importance of resource management.

35. All these perhaps cannot be undertaken on a country-wide basis considering the limitations of human and financial resources but, like area development programmes, certain specific regions can be adopted for a **passive** thrust of extension service geared solely to improve the techno-socio-economic conditions of the region. Results would show the extent of success that can be achieved and the corrections that should be incorporated in the approach to ensure greater success. These then could serve as models for extension in other regions.

36. Regarding provision of welfare schemes for fishermen, there are two extreme situations in the region - one wherein little attention is devoted to fishermen welfare and another wherein there is an exclusive **division** for the purpose in the Ministry. Not only to devise welfare schemes for the community but also to identify situations which require priority attention in the areas such as research management/resource enhancement, coastal aquaculture, infrastructure facilities, extension etc., the basic need is information on the social, economic and cultural characteristics of the community, the level of prevailing technology, the contribution of different sectors and fishing gears to fish production etc. Information available in the region is of varied nature. The issue therefore is:

- to collect such information wherever it is lacking or inadequate through a rapid appraisal, and,
- to obtain detailed information at least in some selected pockets representing roughly the different fishery characteristics in a country.

37. Timely credit facilities have traditionally been provided by the non-institutional sector and this will continue because of ready availability of credit, often without collateral and for any purpose including consumption. The usual complaint from the borrowers is the complexity of procedure in the banks, and that from the bankers, is the default in loan recoveries.

38. The banking system should be made less formal and procedures simplified to mitigate the farmers' complaint : arrangement for recovery of loan instalments **at** the borrowers' houses at a time convenient may solve the latter's problem. In other words, the problems can be reduced to a large extent through closer supervision, guidance **to** borrowers and simpler procedures. Besides productive purposes, credit should perhaps also be made available for consumption and marketing purposes.

39. A coordination of both the systems - informal and institutional - can also be considered. Some money lenders could become certified agents of the formal sector in exchange for a regular control of their operations and the banking sector could become less formal. The Grameen Bank in Bangladesh has introduced a credit scheme involving no collateral and has reduced the cost of loan administration through group lending.

40. Subsidies were provided to facilitate introduction of technological innovations but they have turned out to be equated with grants to sustain the viability of the technology, hence phasing them out has often proved difficult or politically delicate. Moreover, only a limited number of people benefit from subsidy schemes and very often applications are not handled impersonally.



41. Formal education will be a difficult proposition for the fisherfolk. Non-formal education is capable of advancing the objective of imparting the knowledge required by the community folk for organizing themselves to avail of various welfare services, for purchase of production assets, and for adopting improved capture/culture methodologies. To be able to grasp improved fishing methods, they need an upgrading of their managerial capacity.

42. Safety at sea is of great concern with increasing incidents of loss of fishermen or of their battle for life in the sea for days at length. Substantial progress could be accomplished by improving the coordination between the authorities concerned (navy, trade and fisheries), by compelling existing offshore crafts to carry a minimum survival kit and by requesting higher safety standards for new built crafts.

#### Infrastructure

43. Quite a substantial investment has been made in most of the countries for providing landing and berthing facilities, for establishment of ice factories, cold storages, processing plants, for coastal roads and transportation. The bulk of investment naturally has gone for the benefit of the large-scale sector. Some of this investment has turned out to be dead or idle investment, the facility created being seldom or scarcely utilized. Maybe such instances also exist in the small-scale sector. It should be therefore ensured that future investment in infrastructure facilities are **utilitarian**, site-specific and need-based.

44. Upgrading access roads to production areas and improving connections between markets and landing centres would strengthen the bargaining position of fisherfolk in transactions with middlemen.

45. Establishment of "industrial estates" for selected groups of villages with all required facilities for landing, processing, preservation, marketing, repairs and maintenance could be given **serious** attention inasmuch as it is oriented to small-scale sector.

46. Viability of simple, easy to manage marketing information systems can be tested on an experimental basis in a few areas to assess its impact on the middlemen's bargaining power.

47. In the processing sector, special attention could be given to product development of **low-value** and unconventional fish. The small-scale fishermen are in some places engaged in procurement of discards from industrial fishing vessels and utilizing them for fish meal production. A stage may even come to convert these discards to pet food. Instead, it may be worthwhile examining the economic feasibility of converting these discards for human consumption.

48. The role and responsibility of public sector undertakings, fishermen cooperatives and the private sector in the field of fish marketing is worth looking into so as to delineate areas of activity for each sector with the dual purpose of helping small-scale fishermen to get better prices and the public to **have access** to quality product. Perhaps the public sector may have to be relieved from direct involvement in marketing since the financial commitment required is **out** of proportion with what the public sector can deliver.

49. The accelerated pace of motorization/mechanization of fishing vessels requires proper training for fishermen to maintain the engines, establishment of service centres, workshops/repair yards and spare parts outlets.

### Future Approach

50. All the suggestions made above constitute a kind of shopping list from which each country can draw its priorities. Different countries may have different attitudes/approaches to fisheries development. Similarly, policy, approach and aid areas of donor countries may also be different. It would facilitate more fruitful coordination between the donors and the recipient countries, if definite priorities, policies and programmes are laid down by the recipient countries on what would appear principally in two broad sectors: small-scale and large scale fisheries; export and domestic need; aquaculture and agriculture ; public sector including para-statal bodies and private sector.

Donors could :

- finance more "software" projects like extension and training;
- devote more attention to the burden caused by projects on the public budget after the implementation period;
- coordinate better among them to identify projects in a comprehensive framework;
- base more investment projects on the pool of successful pilot projects.

Recipient countries could :

- if a pilot project proves successful, consider adoption of the same on a regular basis as a commitment of its own resources;
- participate more actively in the design of investment projects;

51. An area where there is a distressing gap is between research and development, between the laboratory and the land. There are attempts in some countries to bridge the gap. They should lead to concretization of thoughts and ideas as possible solutions for crucial problems. These then could be considered for joint venture undertakings.

### SUGGESTED ACTION BY THE COMMITTEE

52. The Committee is requested to examine the issues raised in the document, particularly the policies and strategies for fisheries development in the member countries and offer suggestion for actions necessary at national and regional level to address these issues.

COMPARATIVE PICTURE OF MARINE FISH PRODUCTION(1985)  
IN THE PROJECT AREA OF BOBP

	India	Bangladesh	Thailand	Malaysia	Indonesia (Sumatra Matacca Straits)	Sri Lanka	Maldives
Production ('000t)	516	187	304	327	316	140	67
Coast Line (km)	3 010	480	740	900	1 300 ?	1 760	?
Shelf area ('000 km <sup>2</sup> )	120	66	58	47	55	24	
No. of fishermen ('000)	152	156	40	44	113	78	21
Production per							
- fisherman (t)	3.4	1.2	7.6	7.4	2.8	1.8	3.0
- Km coastline (t)	171	390	411	363	243	80	
- Km <sup>2</sup> shelf area (t)	4.0	2.8	5.2	7.0	5.7	5.2 <sup>1/</sup>	
Fishermen per km coastline	50	325	54	49	87	44	?

1/ Estimated production from areas beyond the shelf is deducted from the total production.