

Report of the Fifteenth Meeting of the Advisory Committee

January 28-30, 1991
Colombo, Sri Lanka



**REPORT OF
THE FIFTEENTH MEETING
OF THE ADVISORY COMMITTEE**

January 28-30, 1991
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This document records the recommendations of the 15th meeting of the Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP), held 28 - 30 January at Colombo, Sri Lanka.

The document also contains the annual reports (or status reports) of the projects in the Programme. These reports briefly recapitulate the objectives and status of the activities, describe the work and achievements during 1990, assess the progress and indicate the work plan for 1991. The reports were prepared at the end of 1990 and presented to the 15th meeting of the Advisory Committee.

The Bay of Bengal Programme (BOBP) is a regional fisheries programme which covers seven countries around the Bay of Bengal — Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Programme plays a catalytic and consultative role : it develops, demonstrates and promotes new techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in member-countries. The BOBP is sponsored by the governments of Denmark, Sweden and the United Kingdom, by member-governments in the Bay of Bengal region, and also by UNFPA (United Nations Population Fund), AGFUND (Arab Gulf Fund for United Nations Development Organizations) and UNDP (United Nations Development Programme). The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

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.

April 1991

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REPORT OF THE FIFTEENTH MEETING OF THE ADVISORY COMMITTEE OF THE 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 Fifteenth Meeting from 28 to 30 January 1991 at the Hotel Lanka Oberoi, Colombo, Sri Lanka. A list of participants is given in Appendix A.

2. The Meeting was formally inaugurated together with the Seventh Session of the IOFC Committee for the Development and Management of Fisheries in the Bay of Bengal on 24 January 1991 by the Honourable Joseph Michael Perera, Minister of Fisheries and Aquatic Resources of Sri Lanka.

ELECTION OF CHAIRMAN

3. The Advisory Committee unanimously elected Mr Anton Atapattu, Director of Fisheries (Marine), Sri Lanka, as its Chairman to hold office until the beginning of its Sixteenth 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 AND GCP/RAS/126/AGF)

5. The involvement of non-governmental and voluntary agencies in fisherfolk development needs to be strengthened through orientation and training of their staff in fisheries and fisherfolk concerns.

6. Fisher folk organizations, including fisheries cooperatives, need to be strengthened through necessary support, including training programmes and materials for use by such organizations and by trainers in fisheries agencies.

7. There is a need to assist fisheries agencies in some countries to develop methods and models for interagency coordination in planning and in action to ensure integrated development inputs to fishing communities.

8. Extension inputs to fishing communities could be enhanced by using the services of non-governmental and private sector organizations for undertaking specific components of extension action. Discussion and studies of experiences and opportunities in this regard should be facilitated.

9. The training-and-visit extension system to facilitate small-scale brackishwater culture in India should be tried out.

10. Brackishwater culture should be promoted, wherever feasible, as a supplementary occupation to fishing, in fishing communities.

11. The selection of participants in aquaculture projects should preferably be done through the local administrations.

12. Conservation of by-catch from shrimp seed collection must be encouraged in India and Bangladesh by returning it to the source or by use of more selective gear.
13. In Malaysia, assistance is needed for training in oyster hatchery technology through consultancies or sponsorship of staff training at commercial hatcheries.
14. The post-harvest handling aspects of oysters, including depuration, must be addressed as a matter of highest priority.
15. An assessment of the brackishwater culture potential in the southern districts of Bangladesh is needed.
16. Further research and development in regard to seaweed culture and pen culture of shrimp is required in India and Sri Lanka before such activities can be promoted or extended to the coastal communities.
17. The demonstration of flying fish fishing in Tamil Nadu should include the use of motorized traditional craft since they might be more economical than beachlanding craft.
18. The fishing trials for large pelagic species off the south coast of Tamil Nadu should be continued. Similar trials should also be carried out along the upper east coast of India.
19. The problems of the water-cooled propulsion unit (gearbox, waterpump) of the beachlanding craft in India should be sorted out.
20. Technical and financial assistance should be provided to train local carpenters in construction of new outrigger canoes in Nias Island, Indonesia.
21. Assistance should be provided to work out a financing scheme for introduction of outrigger canoes in Nias Island, Indonesia.
22. Trials of retractable diesel propulsion systems for outrigger canoes in Sri Lanka should continue as a matter of high priority and, as appropriate, be taken up in Indonesia.
23. Alternative materials for the construction of *kattumaram* in India should be investigated.
24. Greater consideration needs to be given to national plans and the plans of other related sectors for integrated fisheries development.
25. Strengthening and upgrading of skills in development planning and programming need to be undertaken as a matter of priority both at the national and state/provincial levels. Such training should not be limited to officials, but should be appropriately broadened to cover fisherfolk representatives and fisheries cooperatives.
26. The establishment of a regional information base should be considered in addition to updating the General Descriptions of Fisheries.
27. Project identification should continue to be an important area of work.
28. The possibilities of further expansion of the successful motorization of *chandi* boats in Bangladesh should be explored.
29. The efforts initiated to subcontract the production of video films, extension pamphlets and other information material to national private organizations should continue and be expanded.
30. The Programme should exercise care in making provocative or controversial statements on fisheries issues, e.g. in the Newsletter, so that they are not misunderstood as official FAO/BOBP recommendations to governments.
31. Since DANIDA and SIDA had provided additional funds to extend RAS/118/MUL by one year, FAO should, as soon as possible, approach the governments of the member countries in regard to continuation of their cash contributions through 1992.

POST-HARVEST FISHERIES (ODA)

32. Marketing problems of fresh fish, including shark, should continue to be addressed in India.
33. The deployment and promotion of ice boxes should continue in India. The need for similar work in Bangladesh should also be considered.
34. The work on utilization of by-catch in India should continue.
35. The possible use of solar-powered ice plants and other refrigeration equipment in small fishing communities in India should be considered.
36. The investigations already initiated on insect infestation and control measures should be continued as a matter of urgency in Bangladesh.
37. The short-term needs in the post-harvest sector of small-scale fishing communities and individuals need to be addressed as a matter of priority.
38. The ODA was requested to extend the Post-harvest Phase II component of the BOBP programme for one additional year, till the end of 1992, so as to continue in parallel with the other BOBP projects.

IMPROVEMENT OF LIVING CONDITIONS OF WOMEN AND THEIR FAMILIES IN FISHING COMMUNITIES (FPA/RAS/904/FPA)

39. While income generating activities and collective action are emphasized in the project document, the social needs are also essential elements that need to be catered to.
40. Considering the importance of project activities, UNFPA should be urged to approve commencement of project implementation as soon as possible.

BIO-ECONOMICS OF SMALL-SCALE FISHERIES (RAS/89/037)

41. There is need for development of methodologies in Thailand and Malaysia for survey and assessment of the impact of artificial reefs on fisheries and fisherfolk.
42. Bio-economic assessment is needed in Malaysia as an approach to the problems of management of the shrimp fisheries.
43. Bio-economic assessment is important for identification of effective management measures for small pelagics on the south-west coast of Sri Lanka. The approach also encourages people's participation, which is essential for the implementation of management measures.
44. A bio-economic study to identify the most effective method for fishing of shrimp needs to be conducted in Indonesia, taking into account the resources, the fisherfolk communities involved, and the proliferation of other types of shrimp fishery gear consequent to the trawl ban.
45. The bio-economic approach to the study of set bagnet fishing in Bangladesh is needed not only to identify the impact of catching juvenile and larval penaeid shrimp but also to enable the utilization of juveniles and larvae of other commercially valuable species of finfish and freshwater prawn and the determination of suitable mesh sizes.
46. UNDP was urged to approve the project enabling continuation of the bio-economic work already initiated, with appropriate rephasing of project expenditure.

ASSESSMENT OF POLLUTION HAZARDS

47. The Committee endorsed in principle the SIDA/National Swedish Board of Fisheries supported project designed to assess the possible effects of pollution on the fisheries. The Programme should contact the individual countries in regard to the degree of participation and operational arrangements.

48. The Committee endorsed the implementation of the proposed investigatory project for “Cleaner Fishery Harbours” supported by IMO.

NATIONAL PROJECTS IMPLEMENTED THROUGH BOBP

49. The promising new type of propulsion system resulting from the fishing craft development project in Kerala, India, should be introduced, as appropriate, in other areas along the east coast of India and in other countries wherever applicable.

50. In the extension training project in Sri Lanka, more attention should be paid to the production of extension material in the three languages for use by extension personnel.

THE THIRD PHASE OF BOBP (1993 ONWARDS)

51. The Committee endorsed the proposal for a new project on “Development and Management of Fisheries in Coastal Communities in the Bay of Bengal” subject to the following modifications of the document before its submission to the member governments and donor agencies.

- (a) In the “General Background”, the development problems relating to sustainability, environmental protection and institutional capacity should be elaborated in such a manner as to clarify the logical link between these problems, the specific issues that need to be addressed, and the objectives.
- (b) The description of the fishery resources situation in India needs to be modified.
- (c) The major “Problems to be Addressed” should include environment, institutional capacity and all aspects of brackishwater culture development.
- (d) The “Project Strategy” should be spelt out more clearly in regard to achieving sustainability through national institutions and in regard to regional cooperation and utilization of project results on a regional basis.
- (e) The “Special Considerations” should be integral elements of the project design and strategy rather than mere considerations.
- (f) The environmental element of the “Development Objectives”, and the need for sustainable development in fisheries should be spelt out more clearly.
- (g) The subjects of sea ranching and use of mangroves as fish nursery grounds should be included among the outputs under “Immediate Objectives”.
- (h) The outputs of the immediate objective concerning institutional strengthening should be more detailed and should include “hardware” as well as organisational and procedural aspects.
- (i) The “Inputs” and the “Budget” should be more detailed.
- (j) The “Additional Inputs” should spell out more clearly the link with an envisaged Post-Harvest Fisheries project and its contents.
- (k) An overall assessment of the impact of past BOBP work should be attempted and included in the “Background” together with relevant portions of the annexure on “Experience of the BOBP”.
- (l) Editorial changes should be made as agreed in the meeting.

52. With regard to further action on the project document, the Secretariat should modify it in accordance with the above recommendations and forward it through FAO to the member governments and to the donor agencies with a request for funding support. This should be done as soon as possible and not later than 31 March, 1991. The deadline for any further comments from members of the Committee should be 28 February, 1991.

OTHER MATTERS

53. In response to a query from the Secretariat, the Committee felt that the present meeting arrangements, including those of the Bay of Bengal Committee, are satisfactory and that no changes need be made for the next meetings.

54. The Committee noted with appreciation the offer of Japanese assistance through FAO and BOBP, and requested the Secretariat to prepare a project proposal on communication with, and organization of, fisherfolk.

55. The Committee's attention was drawn to the forthcoming World Conference on Environment in 1992 and the Global Environment Facility Fund. It requested the Secretariat to explore the possibilities for the Programme to interact with the Conference and the Fund.

NEXT MEETING

56. The Committee noted with appreciation the offer of Thailand to host the Sixteenth Meeting of the Advisory Committee in early 1992.

ADOPTION OF THE REPORT

57. The report was adopted on January 30, 1991.

Appendix A

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Secretary

Appendix B

AGENDA

28 January

1. Opening of the meeting
2. Election of Chairman
3. Adoption of Agenda
4. Small-scale Fisherfolk Communities (GCP/RAS/118/MUL, GCP/RAS/117/MUL and GCP/RAS/126/AGF)

29 January

5. Post-Harvest Fisheries (ODA)
6. Improvement of Living Conditions of Women and Their Families in Fishing Communities (FPA/RAS/904/FPA)
7. Bio-economics of Small-scale Fisheries (RAS/89/037)
8. Assessment of Pollution Hazards
9. National Projects Implemented Through BOBP
10. The third phase of BOBP (1993 onwards)
11. Other matters
12. Next meeting

30 January

13. Adoption of the report

Appendix C

LIST OF DOCUMENTS

1. Agenda
2. List of documents
3. List of participants
4. Annual Report 1990 – Small-scale Fisherfolk Communities (GCP/RAS/118/MUL and GCP/RAS/117/MUL and GCP/RAS/126/AGF)
5. Annual Report 1990 – Post-Harvest Fisheries (ODA)
6. Annual Report 1990 – Improvement of Living Conditions of Women and Their Families in Fishing Communities (FPA/RAS/904/FPA)
7. Status Report – Bio-economics of Small-scale Fisheries (RAS/89/037)
8. Project proposal – Assessment of Pollution Hazards in Fisheries
9. Annual Report 1990 – National Projects Implemented Through BOBP
10. A project proposal for the period 1993-1997
11. Project proposal – Cleaner Fishery Harbours

Appendix D

SMALL-SCALE FISHERFOLK COMMUNITIES IN THE BAY OF BENGAL

(GCP/RAS/118/MUL, GCP/RAS/117/MUL AND GCP/RAS/126/AGF)

Annual Report — 1990

INTRODUCTION

The Bay of Bengal Programme (BOBP) is an umbrella programme consisting of several regional and a few national projects sponsored and executed by different agencies, with FAO as the leading organization.

The main project, Small-Scale Fisherfolk Communities in the Bay of Bengal, GCP/RAS/118/MUL, is the “mother” project of the BOBP. It is funded jointly by DANIDA and SIDA. The initial duration of the project was five years (1987-91), but it has been extended by one year to the end of 1992. The total budget is in the order of US\$ 10 million. This project has supported work in the disciplines of Extension, Brackishwater culture, Fishing technology, Fishery resources and Development support.

The project is supplemented by cash contributions of about US\$0.5 million from the participating governments (Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand). This contribution is intended for the Information Service which covers all projects of the BOBP. It is treated as a separate project, GCP/RAS/117/MUL, for administrative purposes.

GCP/RAS/126/AGF is a project offering training support to “Small-Scale Fisherfolk Communities”. It is funded by the Arab Gulf Fund for United Nations Organizations (AGFUND). It became operational in 1990 and has a contribution of US\$ 0.4 million over three years.

This report covers the three projects mentioned above. An overview of the 1989-90 Programme is given in the document IOFC/DM/BB/91/3 prepared for the 7th Session of the Bay of Bengal Committee. The other projects of the Programme are reported on in separate documents prepared for the 15th Advisory Committee of the Programme.

The report contains a narrative summary for each discipline. Each summary highlights the year's work, problems, issues and future plans. The subprojects under each discipline are then discussed in a table format that gives information about objectives (and how they link with BOBP's overall objectives), targets, achievements and future plans. This reporting format is based on the recommendation made in the 12th Advisory Committee meeting.

EXTENSION

The subproject for integrated fisheries extension in Ranong, Thailand, with four years behind it, gave the staff an opportunity to extract the learning and reflect on it. This was partly facilitated by external consultants, but the extraction of the learning proved to be a difficult and complex activity given the subproject's pre-occupation with day-to-day project work; it requires a lot more effort in the future. The experience in technical fisheries extension is of particular concern as it showed the need for a wide range of technical skills, and improved back-stopping, which suggests the need for better linkages between research and extension.

The fisheries extension subproject in Bangladesh, in spite of its late start, progressed to a point where the staff, with training and field work, have come up with small projects to be implemented at the subdistrict level. To facilitate the implementation of the projects and to learn from them, in order to better develop extension services, the projects need to be continued till the end of 1992.

The extension subproject in the Maldives ran into a policy block because the key needs and concerns of the fisherfolk, as identified by the subproject, turned out to be outside the immediate mandate

of the Ministry of Fisheries and Agriculture. This will require the effort to come up with ways of addressing the needs, through micro-level actions with fisherfolk participation, and to give the Ministry the opportunity to address its constituency within the policy limitations. With an exploratory option, the time period left becomes a crucial constraint.

In Indonesia, with fisherfolk groups formed and trained in selection and management of enterprises, the success of the subproject and any future follow-up would depend on how well the groups perform and how well the fisheries and extension agencies can support and facilitate the groups. This will be reviewed early in 1991 to give direction to the subproject in the future.

The radio programme in Sri Lanka was evaluated and found to have great potential. It is building up its listenership and becoming more responsive to fisherfolk. The quality of technical fisheries programming still needs to be improved. The future sustainability of the programme would depend not only on the Ministry of Fisheries and Aquatic Resources finding funds but also on finding an appropriate location for the radio programme unit where a managerial environment conducive to creative radio programming can be assured.

The regional consultation on fisheries extension and two follow-ups at the national level, one in Sri Lanka and the other in Bangladesh, have helped to think through the objectives and means of fisheries extension within the context of national and fisheries development plans but have also raised more questions than provided answers.

Extension continues to face the dilemma of meeting fisherfolk needs or giving expression to fishery agency capabilities, which often do not match. How should fishery agencies absorb non-fishery concerns and needs into their mandate? How should fisherfolk development, with its time-consuming nature, fit into budget and project schedules which are usually oriented towards shorter periods? Are government agencies designed or even capable of providing all kinds of extension inputs or should there be a move to look to the private and non-governmental sectors for answers? If roads and boats can be given out for construction on contracts, why not clearly identified and specified extension and development tasks? In extracting the learning from extension experiences of BOBP, we will have to increasingly face these questions which cannot be resolved with technology or even information. Policy shifts and new ways to organize may be required to enable self-reliant and sustainable development. And this, perhaps, will be the focus in the year ahead, as the end of the project draws closer.

Details of the status of the subprojects are given in the project descriptions that follow.

Subproject : General Services (EXT/GEN)

Targets 1990

Achievements

Regional Consultation on Fisheries Extension

A three day meeting attended by BOBP member countries, SIDA, DANIDA, FAO and BOBP in Medan, North Sumatera, Indonesia, reviewed the fisheries extension experiences of the region and thought through the objectives of fisheries extension in the context of national development plans and the approaches, techniques and organizational arrangements necessary to address the objectives. The meeting is reported on in *Bay of Bengal News No 37*.

Completion of manual/guidelines for Rapid Rural Appraisals of fisheries/fishing communities

A full scale RRA of a fishing village in Tamil Nadu, done with an international consultant as coordinator, resulted in a manual/guidelines for RRA of fisheries/fishing communities which needs

	<p>to be tested and amended to meet the diversity of the region. One of the things found during the appraisal was that a lot of work was needed to develop RRA techniques which look at fishery practices and fishery resources, as these usually require detailed and longer study. An article in <i>Bay of Bengal</i> News No 38 describes the Tamil Nadu exercise, and the full report will be published as BOBP/MAG/6.</p>
<p>Promoting fisherfolk NGOs through catalytic efforts with NGO funding agencies</p>	<p>Two meetings with NGO funding agencies in India to discuss promotion and support of fisherfolk-targeted NGOs in India were planned for December 1990, but had to be postponed till January 1991.</p>
<p>Country-level workshop on Fisheries Extension in Sri Lanka</p>	<p>A three-day meeting called by the Ministry of Fisheries and Aquatic Resources brought together representatives from all government and NGO agencies concerned with fisheries and fisherfolk development. The exercise, held in August 1990, resulted in analysis of fisheries extension objectives within the framework of the 1990-1994 Fisheries Development Plan and is expected to be taken into consideration in the ongoing reorganization of MFAR and in setting guidelines for fisheries extension in Sri Lanka.</p>
<p>Desk study on Economics of Fisheries Extension – Cost-Benefit Analysis</p>	<p>A national consultant in India undertook an assignment to survey the literature and report on the state of the art of evaluating the impact of fisheries extension services and of the economics of extension. The report is expected early in 1991.</p>
<p>Exchange of ideas with DANIDA Extension Project, Mymensingh, Bangladesh</p>	<p>A meeting on Fisheries Extension in Bangladesh called by DOF and DANIDA discussed the fisheries extension approaches being experimented within Bangladesh – and in particular the DANIDA model for inland fisheries communities and the BOBP subproject for marine fisheries communities.</p>
<p>Participation in DANIDA-sponsored NFAE Project in Tamil Nadu</p>	<p>Not done because of delays in GOTN in beginning the implementation of the project.</p>
<p>Developing organizational management skills of fish vendor women in Madras</p>	<p>Women trained in group management and in the management of a fish market organized themselves into a registered body and were formally handed over the fish market by the Corporation of Madras in August 1990. (See ‘Glimpse’ in <i>Bay of Bengal</i> News No 39). At the request of the women, further training in management and conflict resolution is envisaged. The experience and learning from the assistance given to the women fish vendors in Madras is being documented in BOBP/WP/66.</p>
<p>Unscheduled</p>	<p>Participation in a FAO/ALCOM Regional Meeting in Victoria Falls, Zimbabwe, on Women in Fisheries Development. A presentation was made of a project experience paper and a case study.</p>

Targets 1991

- Follow-up of study on Economics of Extension.
- Follow-up of NGO effort promotion in the fisheries sector.
- Documentation and reporting of learning from BOBP's extension experience in general.

Subproject : Fisheries Extension Service, Maldives (EXT/FES/MDV)

OBJECTIVES

Establishment of a fisheries extension unit and training its staff.

The unit intends to help fisherfolk communities to increase their earnings and improve their quality of life, through (a) training and demonstration of new and improved technologies, primarily in fishing and post-harvest technology, (b) facilitating infrastructural development, and (c) improving communication and organisation of fisherfolk by establishing a network of 'contact fishermen'. The targets of the subproject are fisherfolk communities in Meemu, Vaavu and Faafu Atolls. A countrywide expansion in due course is envisaged.

STATUS 1989

A subproject to establish a pilot fisheries extension service was formulated and agreed to late in 1988 and the subproject started early in 1989. An extension unit has been established within the Ministry of Fisheries and Agriculture (MOFA) and four staff specifically assigned to the subproject. Training of staff has been undertaken in extension methodology and post-harvest fisheries, on-line and in countries in the region.

The extension unit undertook rapid appraisals of all the islands in the target area to assess the status of fisherfolk, and their needs and used the opportunity to hold detailed discussions with fisherfolk about the possibilities of appointing contact fisherfolk to facilitate communication and organization. Potential contact fishermen were identified for all the islands. Four different types of boat hauling devices were constructed, staff trained in their extension, and demonstrated in four islands.

Targets 1990

Report on demonstration of boat hauling devices

Achievements

A technical report focusing on design and construction has been prepared and will be published as BOBP/WP/71.

Assignment and orientation and training of contact fishermen in selected islands

The assignment of contact fishermen has been delayed due to delays in clearance from the President's office, and is expected early in 1991 when orientation and training will be undertaken.

MOFA extension officers (2) trained in extension methodology through training at BOBP and study visits	Two officers undertook a study tour of fisheries extension activities in India and Sri Lanka and had discussions with BOBP staff.
Training of trainers in salt drying of fish	Not undertaken, as the need for trainers was not immediately visible and local trainers in STO were found capable of handling the required training.
Improved technology of salt drying and smoking of fish extended through training and other inputs to selected islands	Twelve fisherfolk from the target atolls were trained in improved salt drying of fish at the STO Fish Processing Centre on Muli Island of Meemu Atoll (a 14-day course).
Improved maintenance of engines extended through training to Meemu Atoll with selected participation from other atolls	Eleven fisherfolk from the target islands were trained in maintenance of engines in a 14-day course on Veymandu Island, Thaa Atoll, by an instructor from MOFA.
Instruction on local manufacture of fishing hooks and lines extended through training and other inputs to one atoll with participation from other atolls	Eight fisherfolk from the target islands received a 14-day training in hook-making from a private sector ironsmith who was hired as trainer. Training was held on Kendhoo Island, Baa Atoll.
Provision of infrastructural facilities on selected islands through direct and catalytic role of MOFA	MOFA had discussions with concerned Ministries regarding infrastructural needs of fisherfolk on target islands, but no concrete action emerged during the reporting period. As a follow-up to the demonstration of boat hauling devices, MOFA is in the process of distributing ten such devices to fisherfolk, on credit, with support from UNCDF.
Development and production of training material on Maldives fishing practices, craft/gear aimed at youth in fishing communities	Not undertaken due to capacity restriction; is planned for 1991.

Assessment

The status and needs analysis of fisherfolk clearly showed that the most important problems relate to collection of fresh fish, prices received for fresh and processed fish, and fuel supply. It also became apparent that very little else in terms of extension of technologies and fisheries development could be addressed without eliminating the bottlenecks posed by collection and marketing. Unfortunately, the key problem areas do not fall within the direct responsibility of MOFA. Catalytic action with other Ministries, to make available fisheries infrastructure to fisherfolk islands, also did not produce any significant results. Considering the stalemate and logistical difficulties, manpower shortages, and difficulties in interdepartmental coordination and action, it is felt that the way to address the concerns would be to enter into dialogue with fisherfolk, using the contact fisherfolk as animators and, with inputs, motivate and promote island and atoll-level collective action. One solution to the problem may be to organize community, or private, collection points to handle and despatch fish from fishing boats to Government collection centres. An alternative could be to set up private, or community, processing centres. Any one of these two would, to a certain extent, overcome problems faced by the community.

Targets 1991

- Assignment, orientation and training of contact fishermen.
- Support for contact fishermen initiatives.

- Costs and earnings study of fishing units.
- Identification of options to improve fish handling and collection.
- Support for pilot activities to improve economic performance of handling and collection of fish.

Future

- Continued support of island and atoll-level fisherfolk actions.
- Reporting.

Subproject : Fisherfolk Radio, Sri Lanka (EXT/RDO/SRL)
(Partly sponsored by NORAD through its Colombo office)

OBJECTIVES

Introduction of a radio programme as a communication and extension tool to help fisherfolk in their development. It is hoped that the radio programme, through participative programming, will give fisherfolk a voice.

STATUS 1989

In 1988, needs, concerns and characteristics of the fisherfolk in the target area of the Puttalam to Matara coastal belt were assessed, through an audience profile study, and a programme strategy evolved. A radio programme unit (RPU) was established within the Ministry of Fisheries (MFAR), consisting of five fisheries officers, who were trained in radio production and broadcasting and headed by a professional broadcaster deputed from the Sri Lanka Broadcasting Corporation (SLBC). MFAR convened a steering committee to guide the RPU in its programming and to protect and insulate it from external pressures.

The programme went on the air on 2.1.89 with daily (Monday-Saturday) 5-minute broadcasts between 18:25 and 18:30 and a 15-minute weekly programme on Sundays between 11:30 and 11:45 on the Sinhala Commercial Service of SLBC. Despite disturbed conditions, the programme was on the air uninterrupted. A non-governmental agency, IRED, was contracted to undertake regular, informal feedback/monitoring studies.

The RPU staff, in addition to in-service training, were trained by SLBC, in the use of field recording equipment, and by the Social Communication Centre, Colombo, in story development and broadcast writing.

Targets 1990

Evaluation of fisherfolk radio programme by an international consultant

Achievements

The evaluation concluded that the programme had made a fair start and emphasised the potential the

programme had in addressing the needs of fisherfolk and giving them a voice. But there was considerable scope for improvement.

- The programming should aim better at its primary target, the artisanal fisherfolk and their families.
- Modifications in programme content, such as lesser use of fill-in music, more fisheries news and features, and better presentation of market information.
- The RPU staff need guidance and training in recognising a good 'story', in researching it, on handling and presenting such a story, and in improved interviewing skills.
- A reorganized Steering Committee with wider representation from both within MFAR and outside it.
- A shift of the RPU from the Welfare Division of MFAR to a more appropriate division concerned with extension.
- Better coordination, planning and management of time by RPU through rostering and planning meetings.

The evaluation recommended that a shift from the Commercial Service to the National Service of SLBC may not only save expenditure, but may also give RPU more opportunities to experiment and be creative. The Consultant recommended against early commercialization or sponsorship, since he felt the low buying power of the target group may not attract too many sponsors.

Mid-term Report

Not undertaken, as it would have essentially duplicated the evaluation effort. An article on the programme appeared in *Bay of Bengal News No 39*.

Regional orientation workshop to promote radio as a development/extension tool for fisherfolk

Not undertaken. The main case study to be discussed was the effort in Sri Lanka and it was felt, after the evaluation, that the programme should be allowed to evolve further before it could be considered as a model for the region. The workshop is proposed for mid 1991.

Training of RPU staff based on recommendations of the evaluation

The international consultant undertook a three-week training programme in October, focusing on interviewing skills, recognizing a good story, researching it and presenting it. The training was done on-line while the RPU produced their regular programmes. The consultant also identified further training needs and resource persons who could help with the training.

Initiation of commercial programme sponsorship

Not done, primarily because the evaluation pointed out that the low buying power of the audience may not attract commercial sponsorship.

Increased fisherfolk participation in programming	Reduced tensions in the country and changes in programming style after the evaluation have shown a distinct increase in fisherfolk participation in programming. But it is still not up to expectation, particularly in terms of the objective of giving a voice to fisherfolk.
Better coverage of technical subjects	This continues to be a weak point. Low levels of technical knowledge amongst the RPU staff (most of whom are very young) and a coordinator who has no fisheries background, and thus cannot be expected to help in this area, has often led the RPU to take the easier option of dealing with non-technical subjects. While the RPU did have access to resource persons in MFAR, inadequate planning often resulted in last minute efforts with poor results.
More comprehensive price information on fish and fishery inputs	Prices of fishery inputs are being announced in addition to fish prices, and the feedback indicates that the programme is meeting the needs of the fisherfolk. However, one of the findings of the evaluation was that price information was found more useful by fisherfolk operating larger motorized craft, who have the option of choosing their sale point.
Monitoring of audience responses and appropriate adjustment in programming	Ongoing, through monitoring by IRED and by RPU staff during field visits, to feed back on a regular basis to the Steering Committee and RPU staff the responses of fisherfolk to the programming.

Assessment

The evaluation has clearly pointed out the potential of the programme and the effort put in by the RPU to keep the programme on the air uninterrupted. The response to the training inputs in terms of programme quality improvement and audience response also shows that, given training and a conducive and creative managerial environment, the RPU staff is capable of very good performance. And this is a concern. MFAR, in its management approach, is not really geared to nurture a creative radio team, the RPU being essentially located in a non-media environment. It may be worth thinking about an alternate location and the SLBC itself may prove to be an option, with MFAR deputing staff and covering costs. The technical fisheries programming capability is also a concern. But this can probably be overcome if the RPU, on the one hand, and the resource persons in MFAR, on the other, take an interest and get their act together. With the end of the subproject only a year away, in December '91, the sustainability of the programme is the other major concern. With the National Service, now priced at the same level as the Commercial Service, and with lesser spatial coverage not being an option, MFAR will have to find budget allocations to keep the programme on the air. Failing which, BOBP's option would be to close down the programme. MFAR is, however, hopeful of finding funds.

Targets 1991

- Programme timing changes, based on the audience, needs study.
- Training of RPU staff in interviewing, programme compilation and presentation and in the use of equipment for editing, mixing and master recording.

- Arrangements for improved and more comprehensive coverage of technical fisheries information.
- Supply of equipment, subject to sustainability of programme by MFAR.
- Determine RPU location, management and financing to enable sustainable programming.
- Regional workshop to promote radio as a fisheries/extension tool.
- Partial commercial sponsorship of programming.

Future

- Training and programming support.
- Reporting.

Subproject : Fisheries Extension Development, Bangladesh (EXT/FED/BGD)

OBJECTIVES

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 the Patuakhali and Barguna districts of Bangladesh. The coastal fisherfolk have had little or no extension services because marine fisheries have had low priority in freshwater-predominant Bangladesh. The subproject hopes to demonstrate that a trained cadre of DOF extension and NGO staff, with some logistic support, project financing support and functioning in a participative manner, can address the needs and problems of fisherfolk communities.

STATUS 1989

The project began in July 1989. DOF staff from all the 11 *upazillas* in the two target districts and staff from two NGOs received training, first, in undertaking participatory rapid appraisals of the socio-economic situation of fisherfolk and their needs and concerns, and, later, on undertaking problem analysis and planning of activities to address the needs of the community.

The first training session was followed by eight weeks of field work for the trainees, along with their normal duties, wherein they put their learning to test. They undertook studies, then documented and presented them for discussion at a consolidation workshop. The second training session in November was followed up with field work, which continued into '90 and would be consolidated in the first quarter.

Targets 1990

Consolidation of training and field work in participatory problem/need analysis and planning

Achievements

This started in November 1989 and was followed up by field work which resulted in the presentation of project ideas and plans to address these at a consolidation workshop of four days in March.

Training in participatory project formulation, planning and implementation	26 DOF and NGO staff were trained at a four-day session in March and this was followed up with eight weeks of field work during which staff, in discussion with fisherfolk, came up with detailed proposals for selected high priority needs. These were presented at a three-day workshop in May.
Orientation workshop on freshwater pond culture	Based on inputs from trainers and BOBP staff, the participants went back to their areas of work for a further two months of discussion to refine the proposals.
Orientation workshop on fisheries resources management	36 proposals, concerning aquaculture, credit for fisheries, credit for non-fishery income generation, marketing and post-harvest fisheries, and social services such as education and health were proposed by the 11 upazillas and 2 NGOs.
Development of training manuals for DOF officers on (i) understanding the fisherfolk community and their needs, and (ii) participatory problem analysis and planning	A four-day workshop conducted in January by a NGO trainer brought together 26 DOF and NGO staff for the orientation.
Identification, planning and initiation by <i>upazilla</i> officers and NGOs of at least one extension activity in each <i>upazilla</i>	Not done due to time constraints. Postponed to mid-1991.
Unscheduled	Draft versions of the manuals in Bengali have been prepared and circulated amongst DOF and a few NGO personnel for comments. Will be finalized in 1991 on receipt of comments.
<i>Assessmeni</i>	After scrutiny by DOF and BOBP, it was agreed to support and plan for 18 of the proposals from the 11 <i>upazillas</i> and 2 NGOs. Initiation of activity planned for December was delayed due to the conditions in the country. Initiation is expected in January 1991. <i>Bay of Bengal</i> News No 40 briefly discusses the projects identified.
The participation and enthusiasm of upazilla level officers and NGO staff have been very high and their performance in field work and in reporting of their work is excellent. However, there	Two concerns came up in the project proposals : the need for training of DOF and NGO staff in group mobilization and support, as well as in savings and credit management. In October, during a five-day session, the training in group mobilization and support was undertaken for 26 DOF and NGO staff.
Assessment	A draft manual on participatory project formulation, planning and implementation has been prepared and will be circulated early in 1991 for comments before finalization.

is concern that too much of learning and information is compressed into too short a time. The limited technical knowledge of the staff is a constraint and was obvious in the formulation of project proposals that indicated a preference for projects which did not require specific fisheries technical inputs. The managerial culture of the department and the upazilla parishads necessitates constant follow-up and supervision, which led to BOBP appointing a full-time trainer in the field.

With low fisheries technical capability at the *upazilla* level and no mechanism for responsive backstopping, the success of technical extension is a concern and needs looking into. But the training has built up confidence and awareness and trainees should be able to implement their projects for the benefit of fisherfolk. Thereafter, with success and the learning from the activities, it may be possible to replicate the effort.

Targets 1991

- Training in savings and credit management.
- Implementation of 18 project activities as planned.
- Orientation workshop on the subproject for *upazilla* chairmen.
- Learning/sharing/supervision workshops every three months.
- Orientation workshop on Fishery Resource Management.
- Study visits to projects in Bangladesh to facilitate implementation of projects.
- Assistance to DOF on utilization of manuals/documents for field-level fisheries officers.

Future

- Continuation of implementation of projects and learning from it.
- Orientation workshop for senior DOF officers on project follow-up and learning from the project.
- Reporting.

Subproject : Extension Services for Small-scale Fisheries in Ranong, Thailand (EXT/ESR/THA)

OBJECTIVES

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

The subproject is aimed at small-scale fisherfolk in the province of Ranong, Thailand. It will generate improved knowledge on the problems, needs and aspirations of fisherfolk, and 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 income amongst fisherfolk. It is hoped that the subproject would serve as a model for integrated fisheries and fisherfolk extension services in the coastal provinces.

STATUS 1989

The subproject started in 1987 by undertaking surveys in 55 coastal villages to better understand the status of fisherfolk, their needs and concerns.

Costs and earnings studies of common fishing practices were conducted to supplement credit needs analysis. A problem census undertaken in three target villages formed the basis for pilot schemes, established with cooperation from other government agencies. These give fisherfolk access to social services.

Subproject activities can be broadly classified into : adapting, demonstrating and extending fisheries technologies; facilitating credit; enabling fisherfolk access to social services provided in cooperation with other agencies; and, of course, learning about extension while doing all this.

In the area of technology extension, the subproject has worked with the culture of oysters of two types, green mussels, shrimps in cages, fish in cages and crab fattening. It has also worked with the capture of crabs and squid using traps.

The subproject has, over a period of time, overcome the growout problems of oyster (*Crassostrea*) by choosing proper sites which are not affected by salinity fluctuations caused by freshwater drainage. But the availability of spat continues to be a problem. Local spatfall is low. Spat purchase affects feasibility. Oyster (*Saccrostrea*) growout and spat luring did not pose any problems and are thriving, but lack of local markets during certain seasons poses problems.

Fish culture in cages is widespread and needed no extension. However, the subproject worked with fisherfolk in fish disease management and in promoting pellet feeding to ease pressure on capturing trash fish. Shrimp cage culture was extended successfully, but a sharp drop in market prices for shrimp discouraged fisherfolk.

Crab traps were successfully introduced after some initial problems in extension, but the subproject is concerned about the crab resources in the area and is hesitant to promote the technology, though fisherfolk are spreading the technology on their own. This concern with crab resources has also affected crab fattening extension which, in addition, faced problems of flooding. Squid traps needed no extension; attempts by the project to improve on the design of the traps, however, are facing resistance from fisherfolk.

With regard to credit, finding no institutional sources of funds (without collateral), the subproject resorted to setting up village-based revolving funds.

Cooperation with other agencies to facilitate access to social services, such as health care, education and

skill training, has been possible with inputs of transportation assistance and some materials.

Project staff have been trained in extension methodology and technical fisheries matters. Several study tours have also familiarized them with similar efforts in the region.

Targets 1990

Identification of areas for fisherfolk training in spat collection, and efforts to overcome oyster growout problems

Study tour of oyster culture activities in Malaysia by project and PFO staff

Study tour of extension activities in Indonesia and Malaysia by project and PFO staff

Production of video film of project and activities

Documentation of work, problems and achievements during the first three years

Crab fattening trials in selected villages

Existing revolving fund/credit schemes consolidated and developed

Achievements

Fisherfolk were trained in spat collection. Spat luring experiments were tried at three sites using bamboo stakes and motorcycle tyre rafts. Spat attachment is low, though it is still too early to say whether spat collection will be sufficient to meet needs. Spat availability remains a problem and will determine the success of oyster culture in Ranong. More work is needed to determine spatfall location and seasonality.

Six staff from the subproject, PFO and DOF undertook a study tour of BOBP's oyster culture activities in Malaysia. Two staff were trained at FRI, Penang, in oyster spat identification.

Eleven staff from the subproject, PFO, DOF, Health, CDD, and NFC undertook a study tour of BOBP's extension activities in North Sumatera, Indonesia, and of the extension services of Kedah State, in Malaysia.

Video team of DOF have completed a film describing the project and its activities.

A two-person consultant team from the Silaparakom University undertook a study to document the methodology and the learning during the project. Their report is expected early in 1991. However, based on the preliminary presentation of findings, a lot more effort is called for to properly extract and document the learning.

Not undertaken due to threat of flooding caused by rains. There is also concern that the crab resources of the area are under stress.

Six groups are functioning well (2 crab traps; 4 oyster culture). Repayments were problematic in three groups where technology proved not viable and where management skills did not meet expectations (1 crab fattening; 2 crab traps). For five groups who have just begun, it is still too early to judge. The need for training in management of revolving funds was identified and partly addressed through training.

Green mussel culture trials in selected villages	Green mussel culture showed promise with good growout, market demand and fisherfolk interest. However, spatfall did not occur, and the activity was considered non-viable with spat brought in from other regions.
Enhanced social services in cooperation with NFC, CDD and Health Department for non-formal education, enterprise development and health	With the cooperation of the Health Department, access to primary health care, immunization and health education was provided to two remote villages. With NFC's cooperation, training in sewing as an income-generation activity was provided to 16 women. <i>Bay of Bengal</i> No. 37 contains extension vignettes from Ranong.
Ranong project and PFO staff trained in extension methodology	Fourteen project staff and 17 staff from PFO, DFO, Health Department, CDD, NFC and PAO were trained in extension methodology at a workshop run by the Institute for Research and Development, Silaparakorn University.
Unscheduled	Training, in disease management and the pellet feeding of fish and shrimp, was made available to fisherfolk undertaking fish and shrimp cage culture on request.

Assessment

The subproject staff at Ranong have showed the capability to undertake a wide range of extension and development tasks. The technical backstopping required for extension (and adoption) of fisheries technology, particularly aquaculture technology, and in assessing resources to justify certain technologies, can be improved. The effort is still more focussed on day to day extension rather than on the subproject's objective of learning and developing approaches of extension. However, this has been initiated by bringing in consultants to study the process and to extract the learning of the work. A lot more needs to be done to extract, and to document the extension and technical learning. The non-availability of credit without collateral is a concern. Village-based revolving funds seem to work, given viable technologies, cohesive groups, committed leadership and ability in day-**to-day** management of savings and credit schemes. But the sustainability of such efforts by the village without continuous supervision is yet to be ascertained. The subproject has shown that interdepartmental cooperation is possible and that this can result in a more integrated input of social and fisheries services to fishing communities. The problem is that such cooperation often depends on fund inputs and cooperating departments are slow in taking on the fiscal responsibility.

Targets 1991

- Finalize documentation of learning from subproject and develop extension guidelines for small-scale fisheries.
- Orientation workshop for DOF staff on subproject learnings.
- Oyster (*Crassostrea Sp.*) spat luring trials (using netlon tubes) in Kapur Bay.
- Fisherfolk organized to undertake marketing of oyster.
- Economic analysis of spat luring, culture and marketing of oysters in Ranong.
- Inputs for management of credit revolving schemes.

- Infrastructure development in selected villages with fisherfolk participation and contribution :
 - Access road to oyster culture site: Kao Nang Hong
 - Water storage tanks: Kor Sin Hai
 - Water ponds : Kor Lao
 - Fishing pier : Km 70.

Future

- Adoption of extension approach and its expansion by Department of Fisheries.
- Utilization of documentation of the learning from project by DOF while training extension staff.

Subproject : Improved Earnings of Small-scale Coastal Fisherfolk, Indonesia ***(EXT/IEF/INS)***

OBJECTIVES

To improve the earnings and socio-economic status of fisherfolk in coastal communities through improving their managerial capacity by emphasising group action. The target groups are small-scale fisherfolk in coastal villages of Langkat district of North Sumatera Province.

STATUS 1989

The subproject, originally intended to demonstrate an institutional credit system, changed focus because participatory studies during the preparation showed that an informal credit system already existed and was capable of meeting fisherfolk needs. The subproject focus shifted to improving the managerial capacity of fisherfolk by emphasising collective action. It was felt that selection of viable and sustainable enterprises was particularly important given the resource-scarce situation and the intensive, multi-gear fishery in the inshore region.

The subproject embarked on group mobilization. Since this kind of process is known to take time, a time horizon of four years was set. The first year's effort showed that groups, when well formed, can be cohesive and accelerate into enterprise development. The staff of the PFS and extension services were trained and became capable of group formation, group management and assisting groups in selecting enterprises. However, fisherfolk, in order to apply their knowledge and learning, needed inputs of information about enterprise options in a wide range of fishery and non-fishery areas, as well as economic information about these enterprises, to enable decisions to be reached. They also needed inputs, like technical training, to take up enterprises and training in management enterprises.

The eight groups formed functioned well, started mobilizing savings, initiated enterprise selections and were actually using their collectivity to address other needs. An example of a kiosk is given in *Bay of Bengal News* No 37. The enterprise selections were, however, restricted to their existing knowledge/skills and did not consider new opportunities.

Targets 1990

Identification of enterprise options with descriptions and feasibility analysis by PFS and cooperating agencies.

Methods, training materials and media by which improved management of small enterprises can be demonstrated

Fisheries and Extension Service staff trained in group mobilization, and in demonstrating and enabling management of fisherfolk enterprises

Support of fisherfolk group enterprises through demonstration of technologies and support of technical trials

Evaluation of fisherfolk groups' performance as a collective body

Continued support to the fisherfolk and their enterprises, particularly through training in management and utilization of credit

Support, where necessary, of fisherfolk enterprises in gaining access to credit

Replication of extension methodology in existing target villages in Langkat district, if requested by fisherfolk

Achievements

Was not undertaken because the PFS and the cooperating agencies are not equipped to undertake such opportunity analysis tasks for the wide range of enterprises that have potential in the region.

Methods and training materials were developed as a part of the training received by the project staff from Bina Swadaya, a NGO. However, it has not been formalized and documented into a manual as had been planned.

Three project staff and one staff of the extension service received training for a month at Bina Swadaya in Jakarta. They also visited two projects with similar efforts in other parts of the country during a three-week study tour to learn from other experiences.

Partly done. Three study tours were organised for the fisherfolk groups to visit other groups in the region who were undertaking similar enterprises.

Not done due to difficulties in finding a national consultant to undertake the review. Planned for completion in January 1991.

The project provided limited on-line support and training to groups in the management of their enterprises. Additionally, training was organized in the feasibility of fish processing enterprises.

The mechanisms by which credit could be supplied – for example, through revolving funds – and administered in a sustainable way have not been established.

The need for extra credit, in spite of considerable capital accumulation by the groups through savings, was difficult to explain since studies earlier had shown that informal credit was available. This, however, could be because tokes provide credit for fisheries and most of the selected enterprises were non-fishery related.

Not done as no requests were received. The focus was on supporting existing groups and consolidating their performance. It would also have been premature to replicate something which had not as yet been properly established.

Assessment

Progress in the development of viable economic enterprises by the groups has been slow for several reasons: the intensive pressure on resources makes it difficult to come up with sustainable new enterprise options; the fisherfolk themselves were limited in their search through lack of experience and knowledge; the PFS and the cooperating agencies are not equipped to feed technical and economic information about potential enterprise options or to provide the necessary technical inputs to facilitate such efforts; in spite of capital accumulation through savings, the groups feel that they need further credit for their enterprises, and this is surprising since earlier studies showed that the informal credit structure was capable of handling the need, though, perhaps, only in the fisheries sector; and, the delays in enabling the groups to start their enterprises may have dampened their initial enthusiasm.

The extension effort depends entirely on formation and performance of the groups. It is, therefore, vital to review the methods and materials used to form and assist the groups and to understand the groups' performance and capabilities. The review planned early in 1991 should provide the directions and guidelines to the activity and, in particular, suggest how the PFS could equip itself to carry the task forward on its own.

Targets 1991

- Review of fisherfolk group formation and performance.
- Support to fisherfolk groups and their enterprises as per needs identified in the review.
- Training manual by which improved management of small enterprises can be demonstrated.
- Staff trained in opportunity analysis to feed fisherfolk information on enterprise options.
- Assessment of usefulness of manuals used by the subproject, and initiation of their dissemination and use.

Future

- Assessment of extension approach and its potential use by Department of Fisheries.
- Reporting of Project Experience and Learning.

BRACKISHWATER CULTURE

Oyster culture in Malaysia made significant advances in spatfall prediction, market development and fisherfolk involvement. The Fisheries Research Institute's presence on the east coast was a significant stimulant to local involvement by both fisherfolk and the Trengganu State Fisheries Department. Culture and marketing trials of *Crassostrea* species on the west coast indicate that the culture will be profitable. But survival of young spat needs to be improved.

Although important knowledge was gained of the life cycle of *Gracilaria* in Puttalam Lagoon, Sri Lanka, significant production remained illusive. Much more time will be required to develop a viable culture technology, if it is possible at all.

A freshwater prawn hatchery was completed at Potiya in Bangladesh and initial trials began late in the year. Construction of a small pilot hatchery for penaeid shrimps began at Digha, West Bengal, in December, and will be ready early 1991.

Initial trials with nursery cage culture in West Bengal were promising and the technology well received by participating fisherfolk. A similar activity in Bangladesh also had a good response from fisherfolk. Fast growth of shrimp fry and identification of good local markets were outcomes of the work

in 1990. The land dispute between the Departments of Fisheries and Forestry in West Bengal over the site of the nursery ponds at Moynapara was partially resolved. It was hoped that the first training programme could begin in early December. However, village political interests in participant selection now makes it unlikely that the activity can ever be implemented.

The work during the remaining period of the project will concentrate on the subprojects in West Bengal and Bangladesh and aim at collectors of shrimp and prawn seed, better seed supply through hatcheries, and conservation of the natural resources of shrimp seed and fish fry.

The oyster culture subproject in Malaysia should continue for at least one more year. A regional consultation on mud crab culture is proposed as a new activity. The seaweed work in Sri Lanka will be discontinued since it will not be possible to achieve the objectives within the time-frame of the project.

Subproject : General Services (B WC/GEN)

Targets 1990

Achievements

Analysis and report of seaweed project in Mandapam

Done, and will be published as BOBP/WP/65.

Report on Seaweed Seminar

Done, and published as BOBP/REP/45

Study tour of Indian officials to observe brackishwater culture research in Thailand and the Philippines

Postponed till the first quarter of 1991.

Regional consultation on crab fattening practices.

A call for information (papers) was issued to determine level of interest. A regional seminar is planned for mid-1991 depending upon response.

Cage culture of shrimps in Sri Lanka and Indonesia under TCDC arrangements

Not done in the absence of requests from the countries concerned.

Targets 1991

- A pre-feasibility study of mariculture options in the Maldives.
- Study tour for Indian fisheries officials to Thailand and the Philippines.
- A regional consultation on mud crab culture.

Subproject : Sea weed (Gracilaria) Farming, Sri Lanka (B WC/S WD/SRL)

OBJECTIVES

Assessment and demonstration of the technical, economic and social viability of small-scale seaweed culture through community participation among fisherfolk exploiting the Puttalam Lagoon.

STATUS 1989

The subproject was started in 1988 by the establishment of a spore-setting facility to be operated by

NARA and a village farm module under the management of a NGO. Sporadic spore-setting trials during 1989 were inconclusive. Culture based on vegetative propagation in the farm modules failed because of grazing by rabbit fish. Grazing control, using fencing material around the culture area, was in progress. It became clear that *Gracilaria* reproduction and growth are highly seasonal, thereby constraining profitability. The domestic situation has hampered all aspects of the field work and, particularly, the survey of wild stocks of seaweed, a supplementary component of the subproject.

Targets 1990

Spore-setting with attention to the effects of salinity and nutrient concentration on spore development

Growout trials within fenced units at one village site with vegetative cuttings and loose seaweed scattered on the bottom

Assess varieties and distribution of dominant species along the west coast.

Achievements

The life cycle of *Gracilaria* differed totally from what was experienced in 1989. As of December 1990 there was no significant regrowth of seaweed. Neither spore-setting nor vegetative propagation could be undertaken. Salinity data have been collected on a regular basis, but nutrient data collection has been so sporadic that it will be of little use.

Vegetative cuttings outplanted in January and February had poor growth. Attempts to “bottom” culture *Gracilaria* were seriously affected by sedimentation. This does not appear to be a feasible method.

Field sampling has been very sporadic partly due to the domestic situation. Very little of value has been obtained.

Assessment

The trials have encountered two major problems in achieving economic viability of the culture; both appear to be insurmountable. Productive growth is limited to a very short period of the year and the plants have to be protected against grazing. It is also not certain that the spore-setting techniques will work. The work has resulted in better knowledge of the life cycle of *Gracifaria*, but much more systematic long-term research appears to be required before further attempts at commercial culture trials. Since such research is not within the scope of BOBP, the subproject has been terminated.

Subproject : Prawn Seed Supply, India (BWC/PSS/IND)

OBJECTIVES

Introduction of methods and techniques to increase the supply of prawn seed and the income of seed collectors in West Bengal.

Landless peasants engaged in shrimp seed collection in the semi-saline zone of West Bengal constitute the primary target group. Any hatchery development

will of course not directly benefit this group, but is considered of national interest and priority because of indirect benefit, since it will ultimately help to preserve the natural resources. The original objectives of the subproject included the improved utilization of seed by-catch. It was, however, considered unrealistic within the time-frame of the project and has been deleted. A qualitative and quantitative assessment of the by-catches remains.

STATUS 1989

The subproject started in 1988 with a survey of households in 29 villages in two districts. A consultant undertook a study on seed collection methods and demonstrated improved methods to catch shrimp seed. In 1989, the construction of a 20-unit, 4000 m² nursery pond complex was started at Moynapara, 24 South Parganas district. Group formation and training of women seed collectors was undertaken with the help of a NGO. Group formation, based on family units, and training in nursery cage rearing were started at Ramnagar, Midnapur District. A feasibility study of a hatchery for penaeid shrimps was completed with the help of a Thai consulting team.

Targets 1990

Economic model of pond nursery rearing

Complete nursery pond construction and training NGO and DOF staff at Moynapara in nursery pond rearing methods

Construct small model penaeid hatchery at Ramnagar, Midnapur

Train DOF and private sector in hatchery operation

Train NGO and DOF staff in cage nursery rearing and use of lure lines for seed collection.

Achievements

Not yet done.

The nursery pond complex was completed at Moynapara and initial training given to 30 female participants. The land dispute between Forestry and Fisheries Departments was temporarily resolved, allowing training to begin in early December. However, interference by vested political interests prevented implementation of the activity in 1990.

Problems with power supply, poor groundwater quality and other uncertainties will make successful operation elusive. It was therefore agreed with the West Bengal DOF to limit the construction to a small-scale modular hatchery at Digha (where basic facilities already exist) to test the proposed technology. Construction will be undertaken in early 1991.

Not done due to above reasons.

Nursery cage operation was started at Ramnagar with 12 participating families. Initial results showed rapid growth and good survival, although variations in salinity affect rearing practices. A second village in Ramnagar has been included in the activity and family group formation began in the last quarter of the year.

	Participants and DOF staff were shown the use of lure lines, but a full season of trials will be necessary to evaluate their acceptance by seed collectors.
Undertake shrimp seed by-catch study	Two biologists were engaged in cooperation with CIBA (Central Institute for Brackishwater Aquaculture), and they began sampling in June. The field programme is on schedule.
Assess economic and social feasibility of lure lines, nursery cages and nursery ponds	Not yet done. At least one full season of operation is necessary to collect sufficient production data.

Assessment

Nursery cages show good potential. Some preliminary marketing has encouraged the participants and they have readily taken up the technology. Lure lines will need extensive trials to prove their effectiveness. Although the temporary resolution of the land dispute would have allowed implementation of the activity, village political interests in participant selection have put the activity in great jeopardy and it is now doubtful whether it can go forward at all, particularly if another season is lost. The BOBP field motivator has been important in maintaining momentum and communicating between village participants and BOBP. Although the consultants' report had recommended construction of a penaeid hatchery at Ramnagar, further investigation revealed serious constraints which put in doubt the outcome. A small modular hatchery is being constructed at Digha, Midnapur District, to test the brine-based rearing technology. The seed by-catch study is running smoothly and should assist in an evaluation of the effect on coastal fishery resources of the seed collection. Some ideas on how to better utilize commercial species found in the by-catch will also develop. As an example, sampling showed that larvae of the mangrove crab, *Scylla serrata*, are seasonally abundant.

Targets 1991

- Complete seed by-catch study.
- Train NGO's in cage nursery rearing technology.
- Evaluate economic and social feasibility of nursery culture in cages and ponds.
- Complete one season's trials with lure lines.
- Construction of a 10 MT demonstration hatchery at Digha.
- Train DOF staff in hatchery operation.

Future

- Assist in marketing of shrimp juveniles produced by nursery cage culture.
- Extend nursery cage culture to additional participants and areas.
- Reporting and recommendations.

Subproject : *Fish and Prawn Seed, Bangladesh (EWC/FPS/BGD)*

OBJECTIVES

Introduction of methods and techniques to increase the supply of prawn seed and the income of seed collectors.

The primary target groups are the many landless peasant families engaged in shrimp seed collection in the semi-saline zone. An important secondary concern is the national interest of the best utilization of the country's resources. Accordingly, one of the objectives of the subproject was to improve the utilization of by-catches. However, this had to be deleted because of the late start of the subproject due to delays in GOB clearance.

STATUS 1989

The subproject started in mid-'89. A feasibility study of a small-scale, brine-based freshwater prawn hatchery was undertaken. Estimated rates of return were high over a wide range of production and price conditions. Another study described and analysed the freshwater prawn seed market in Chittagong and Patuakhali districts. See *Bay of Bengal News No 38*.

Targets 1990

Complete construction of small-scale *Macrobrachium* hatchery

Achievements

Done. Hatchery with capacity of four million juveniles per year completed at Potiya Fish Seed Production Center. Two biologists hired by BOBP to assist DOF staff. The teething troubles were, however, not overcome to allow production before the end of the season.

DOF and private sector trained in small-scale hatchery operation

Done. Five-week training at private hatchery in Bangladesh. Two private sector participants and five government staff attended.

Study tour to Thailand to observe freshwater prawn hatchery technology

Done. Seven persons, including the two BOBP biologists and the hatchery manager, undertook a one-week tour. The hatchery manager was, unfortunately, transferred to another assignment on completion of the training.

Trials of floating nursery cages for freshwater and penaeid prawn seed

Cages constructed and trials initiated at Magnamapara in Chokaria Sunderbans for *P. monodon* and near Potiya, Chittagong, for *Machrobrachium*, in cooperation with a NGO.

Demonstration of lure lines as a method of catching tiger prawn seed

Not yet started.

Video clip

Done. A ten-minute video on nursery cage culture and related activities at Magnamapara was produced by a national NGO.

Assessment

The progress during the year has been satisfactory, although it was a little disappointing that the hatchery operations could not be started. Another year is required to establish the viability of the hatchery and the nursery rearing.

Targets 1991

- Establish feasibility of hatchery.
- Construct one additional freshwater prawn hatchery, depending upon results from first hatchery.
- Establish socio-economic feasibility of nursery cage culture.
- Training for private sector and government extension staff in freshwater prawn larvae culture.

Future

- Extension materials.
- Extension of hatchery and nursery rearing techniques.
- Reporting and recommendations.

Subproject : oyster Culture, Malaysia, BWC/OYS/MAL

OBJECTIVES

Introduction of small-scale oyster farming as an income-generating activity for coastal fisherfolk households on the west coast of peninsular Malaysia.

STATUS 1989

The subproject started in 1988. Marketing studies undertaken that year indicated an undersupplied oyster market. Spat collection activities were also started and have since been undertaken at several places on the west coast of peninsular Malaysia as well as on the east coast. Satisfactory spat falls have been recorded at one site in Langkawi (*O. folium*), two other sites on the west coast (*Crassostrea sp.*) and two sites on the east coast. Spat transplantation from the east coast to the west coast has met with partial success.

Growout trials of *O. folium* in Langkawi have proven to be technically feasible and economically viable if the shucked meat can be marketed outside the island (in Penang). Growout trials of *Crassostrea sp.* in trays, at two locations on the west coast, have been encouraging. The Thai method, using cement poles, did not work. Cooperation has been established with USM, under an IDRC-funded project, to culture hatchery-produced spats produced by them. Bacteriological monitoring had been planned, but not implemented.

Targets 1990

Techno-economic report on *O. folium* culture

Achievements

Done. It will be published as BOBP/WP/73

Extension of *O. folium* culture to fisherfolk

Four fishermen were selected from the participants in last year's people's participation workshop- in

	Langkawi. They have been operating rafts with net panels for spat collection and growout. But spatfall was insufficient during the year and the operators have lost interest in the work.
Evaluate economics of bag and tray culture	Production from the systems at Batu Lintang and Telaga Nanas has not been sufficient for a definitive evaluation. Preliminary calculations at prices actually obtained in local markets, and using estimated production, indicate favourable rates of return on investment.
Marketing trials to cover major consumption centres	Done in Penang for <i>O. folium</i> from Langkawi. A private marketing consultant was contracted to identify buyers at all major centres and their list will be utilized in future marketing work. Local marketing of whole oysters and shucked meat from Batu Lintang looks promising.
Expand bacteriological monitoring to all culture sites	Not accomplished due to lack of facilities and staff at FRI. Limited monitoring has been done at Langkawi and Telaga Nanas. Langkawi waters are well within WHO sanitary standards, while Telaga Nanas is on the borderline and will require careful monitoring to delineate seasonal variations in bacterial contamination.
Training workshop on oyster culture for Fisheries Agents	Conducted at Palau Sayak in March. There were 21 participants at the three-day course.
Video documentation	Done by the Department of Fisheries.
Unscheduled	A three-day training course in oyster culture was held for 15 fishermen at Pulau Sayak in October.

Assessment

One fisherman in Langkawi has continued the culture of *O. folium* on a part-time basis and has sold small quantities of shucked meat locally. Initial sale of frozen meat in Penang could not be sustained. The local prices are too low to make the culture viable. The uncertainty about spatfalls experienced by the other fishermen and the low prices seem to hinder commercial development. The activities at Langkawi have therefore been terminated.

The ongoing spat collection by netlon tubes and growout in trays in Batu Lintang and Telaga Nanas look promising. Spatfall prediction techniques were refined during the year. Eyed larvae counts have proven to be very useful. But further work is required to obtain sufficient quantities of spats for fully commercial culture. Survival of newly set spat is also still too low.

Spats from the east coast have grown well in a few cases on the west coast after transplantation. *Crassostrea iredalei* from Trengganu has been successfully introduced at a few sites and grown from spat to market size. The most notable example was the Muar River, where the traditional fishery is over-exploited. Culture trials and marketing at that site indicate it may be possible to rejuvenate production through culture. But considering the logistics and costs it is believed that commercial culture on the west coast has to be based on locally available spats. The spat collection trials on the east coast generated interest in commercial oyster culture there, and this has been taken up on a limited scale.

Stronger emphasis has to be given to bacteriological monitoring to convince the consumer of the safety of oysters.

Targets 1991

- National oyster culture seminar.
- A routine programme for bacteriological monitoring at culture sites.
- Expanded fisherfolk involvement through visits and training courses.
- Further improvement in spat collection techniques.
- Refinement of culture systems to reduce costs.
- Development of marketing strategies.
- Assess feasibility of spat transfer from the east coast.

Future

- Demonstration, extension, training.
- Extension material.
- Reporting and recommendations.

FISHING TECHNOLOGY

During 1990, as in the previous year, emphasis has been given to less exploited resources, fuel economy and the environmental aspect of craft construction. The bulk of the effort has been devoted to implementation of subprojects on development and demonstration of outrigger canoes in Indonesia and Sri Lanka, on beachlanding craft introduction in India, and demonstration fishing for large flying fish and large pelagic species offshore in India.

In Sri Lanka, the design and method of construction of new outrigger canoes has been transferred to fisherfolk. Eight new canoes have been built on commercial basis for traditional *oru* fishermen. A new diesel inboard propulsion system has also been developed for this type of canoe. In Indonesia, two new inboard motorized outrigger canoes have been fully tested and demonstrated in commercial fishing. The feasibility of these two canoes employing hook-and-line has been established. The cooperating fishermen have expressed interest in new outrigger canoes, and the design of a hybrid version has, therefore, been prepared for introduction.

In Thanjavur District, Tamil Nadu, India, the economic feasibility of catching less exploited large flying fish by gillnets has been demonstrated.

Exploratory fishing for large pelagic species in the southern area of Tamil Nadu has been initiated with limited success. The fishing operation has been going on for only a few months, which is too short a period to draw any conclusion.

The economic feasibility of beachlanding craft (BLC) has been reconfirmed in Thanjavur District, Tamil Nadu. A technical and economical base has been established for the Government to initiate BLC introduction. As regards introduction of BLCs in Andhra Pradesh and Orissa, non-availability of engines and gear box is of concern.

Besides implementation of these subprojects, services have been given on a reimbursable basis to the FAO/TCP Project for development of small fishing craft in the state of Kerala, India. Inputs in design, construction, testing and demonstration of new plywood canoes and an inboard propulsion

system were provided till the end of October 1990. The new propulsion system, using rubber bellows, is of particular interest and might be a suitable alternative also for beachlanding craft.

The proposed workplan for 1991 deals with further demonstrations and extension of outrigger canoes in Sri Lanka and Indonesia and of flying fish fisheries in India. It is hoped that conclusive results from the fishing trials for large pelagic species will be obtained during the year and that subsequent demonstration and extension activities can be started. Information gathering and regional consultation on squid fisheries and safety at sea are contemplated. It is noteworthy that the BLC does not appear in a separate subproject for the first time since the start of the BOBP; only an impact review and video documentation of it remain to be done.

Subproject : General Services (FIT/GEN)

Targets 1990

Achievements

Observation of pole-and-line fishing in the Maldives by three Sri Lankan fishermen and fisheries officials (TCDC)

This study tour was organized in early 1990. The Government of Maldives made all local arrangements. BOBP's input was limited to air travel costs.

Promotion of Tuna fishing in Sumatera, Indonesia

Follow-up on draft proposal for TCP awaited from the Government of Indonesia (DGF).

Advisory services on safety of small fishing boats

Consultancy services were provided for preparation of guidelines on construction and safety of offshore boats and for safe working conditions of crew in Sri Lanka. The result will be published as a working paper, BOBP/WP/79. It could then be used as a background document for a regional consultation on the subject, depending on the interest of the member countries.

Advisory services for feasibility of FRP as boat-building material in Bangladesh and Thailand.

Not done. TOR was prepared and discussed in Bangladesh, but no request was received from the Governments concerned.

Consultation on small-scale squid fishing

Postponed till 1991.

Reimbursable services to national projects

Fishing craft development in Kerala, India (FAO/TCP), participation in an FAO/GOI workshop on ferrocement boats and liftnet fishing trials with new trimaran in Tanzania (FAO).

Targets 1991

- Impact evaluation of BLC introduction in India.
- Video documentation of BLC introduction in India.
- Consultation on small-scale squid fishing.
- Reappraisal of building materials for *kattumarams* in India.
- Construction of new inboard propulsion system with rubber bellows.
- Consultation on safety at sea.

Subproject : Fishing Boat Development, Sri Lanka (FIT/FBD/SRL)

OBJECTIVES

Development and demonstration of new alternatives to conventional craft, in order to increase earnings of fisherfolk by reducing costs, and improving efficiency, and to provide comfort during operations.

The small craft (oru), common along the south and southwest coasts, are beach based, fish in inshore waters and are operated by crew on share basis, sometimes together with the owner. The operational areas of larger craft are island-wide, with bases at the major fishing centres; they fish offshore (35-120 nm) and each is usually operated by a crew on share basis with the owner as shore manager.

STATUS 1989

Several years of development and testing (1983-87) resulted in a safe, comfortable and fuel-efficient small offshore fishing boat (SRL-15). Commercial demonstrations carried out in 1988 established the economical feasibility of the final version of the boat, and the first boat was ordered by a fisherman. However, despite continuing successful operation, further introduction is at a standstill. The range of operation of offshore fishing has extended beyond 100 miles and private boat owners and crew seem to prefer larger offshore boats.

Development of new outrigger canoes as alternatives to the traditional outrigger canoes (oru) of the southern area of Sri Lanka was initiated in 1985. Design, construction and extensive testing of 8m prototype canoes SRL-17 (plywood), SRL-18 (wood) and SRL-19 (FRP) established the technical and economical feasibility of SRL-18. The acceptance by fisherfolk of Doddanduwa, a fishing village, was also ascertained. Six fishermen agreed to use locally built canoes. Local carpenters were to be trained during the construction of these canoes.

Targets 1990

Information seminar on small-scale offshore fisheries in Sri Lanka

Technical and financial support in construction of SRL-18A and SRL-19A to interested fishermen

Achievements

Held early in the year. It highlighted the need to upgrade the construction of small offshore boats for improved safety and comfort of crew through introduction of appropriate guidelines. Proceedings of the seminar have been published by the Ministry of Fisheries. *See also Bay of Bengal News No 38.*

Six planked SRL-18A outrigger canoes have been built for local fishermen of Doddanduwa. *See Bay of Bengal News No 38.* Four local carpenters were trained in all aspects of the construction. Same type of support and training is ongoing in Balapitiya.

	Access to credit for the fishermen/owners of new canoes to purchase engine and fishing gear, and for the trained carpenters to purchase tools, was facilitated by the project staff.
Construction of one FRP outrigger canoe (SRL-19A) and demonstration at Doddanduwa	Done. The canoe is being demonstrated in Doddanduwa.
Assess suitability of longtail L-90 diesel engine in outrigger canoes (SRL-19)	Testing of a longtail diesel unit on outrigger canoes was carried out with negative results – too low speed and excessive splashing on the engine. As an alternative to longtail systems, a retractable propulsion system with rubber bellows was developed and constructed for inboard installation in SRL-19. The technical trials to establish the reliability are ongoing.
Video film and pamphlet	Completed by World View International, a sub-contractor.
Recommendations for further development and extension	Besides continuation of testing of the diesel propulsion system, the major recommendations were : <ul style="list-style-type: none"> – For longer sea trips and increased range of operation, promote use of insulated ice box. – Demonstration of hook-and-line fishing with outrigger canoes fitted with diesel propulsion systems. – Training of more carpenters in construction of the new canoes (SRL-18A). – Demonstration of wood and FRP outrigger canoes in more fishing centres. – Facilitation of credit.
Unscheduled	Modification of SRL-15 mould for installation of different makes and sizes of inboard engines.

Assessment

It seems that too few SRL-15 boats were built and demonstrated to generate enough interest from fishermen and boat owners.

The cost and earnings data of the new outrigger canoes collected for a second year of operation confirmed the viability of this size and type of outrigger canoe. The fishermen of Doddanduwa are convinced of the feasibility of the new wooden canoe. They are also interested in the FRP canoe. However, because of the high cost, the demand for it is yet to materialize. There seems to be a need for demonstration of more than one FRP canoe to generate enough interest from the fishermen.

Visits of fishermen of other fishing villages to Doddanduwa generated a lot of interest in the new outrigger canoes and resulted in a firm order of one canoe and an agreement with two fishermen of Balapitiya for construction of two canoes and training of two local carpenters.

Access to credit for engine and fishing gear has facilitated the introduction of canoe and engine. Credit facilities for complete fishing units are needed.

The training of local carpenters by private master carpenters and boat builders went off very well and the trainees have ventured into commercial, village level construction of canoes.

Targets 1991

- Technical and financial support to construct SRL-18A for interested fishermen in two or three new fishing centres.
- Construction of two more FRP canoes, SRL-19A, for further demonstration.
- Testing and demonstration of inboard retractable diesel propulsion systems.
- Demonstration of insulated ice box on board the outrigger canoes.
- Demonstration of hook-and-line fishing from canoes fitted with diesel engine.
- Facilitation of credit for introduction of outrigger canoes.
- Preparation of extension and training material, pamphlets, slides etc.

Future

- Facilitation of further introduction of canoes.
- Reporting.

Subproject : Beachlanding Craft Introduction, India (FIT/BCI/ND)

OBJECTIVES

Introduction of beachlanding craft to increase income of fisherfolk and fish production.

STATUS 1989

The subproject was started back in 1979 and the first BLC prototypes were built and tested in 1980. Several more prototypes were built, tested and demonstrated in commercial fishing till around 1985. Two different designs, IND-20 and IND-25, emerged as suitable solutions. Commercial construction of these craft commenced in 1985. The introduction of BLC under different financial schemes is ongoing in Andhra Pradesh and Orissa, but with varying degrees of success. About 250 BLC had been introduced in these two states and at least 50 more BLC were in the pipeline. The IND-20 (deck type), fitted with water-cooled engine, has been mainly introduced because it has proven to be the most suitable design and is preferred by the fishermen. However, the IND-25 (open type) is still introduced to a limited extent under the NCDC scheme in Orissa.

In West Bengal, the introduction of BLC has been limited to two BLC, IND-20, for the Fisheries Department to carry out demonstrations. The feasibility of the craft has not yet been established.

In Tamil Nadu, the introduction of IND-25 under the NCDC scheme failed for various reasons and

is at a standstill. However, the demonstration of IND-20 fitted with water-cooled diesel engine has been successful in Thanjavur District.

Reliability of reduction gear box and waterpump of the VST water-cooled diesel engine is still of concern.

Targets 1990

Completion of socio-economic study

Achievements

Done for three fishing centres in Orissa, Andhra Pradesh and Tamil Nadu. The report will be published as BOBP/WP/74. The study provided a better understanding of :

- Techno-economic and social factors which have led to adoption or rejection of BLC by fisherfolk communities.
- Operation of BLC and interaction with operation of other traditional craft.
- Economic performance of BLC compared with other traditional craft.
- Income distribution between BLC owner and crew.

Inventory of BLC in operation

Done in all the four states of the East Coast of India. It gave a good picture of the distribution of BLC. They total about 300, of which some 80 were still waiting for engines in the APFC boatyard.

Demonstration of BLC operation in Tamil Nadu for one more year and technical support for introduction of more craft

The demonstration of IND-20 in Thanjavur District was continued and the economic viability consolidated. As support for introduction of more craft, a one-day seminar was organized for banks and fisheries staff. The report on the trials and demonstration will be published as BOBP/WP/75.

Training of two sail-makers in making sail (dipping lug)

Training conducted for one sail-maker of APFC boatyard, Kakinada, Andhra Pradesh.

Training of ten trainers and 150 fishermen/operators in operation and maintenance of BLCs

Training in operation and maintenance of BLCs was conducted in one fishing centre in Andhra Pradesh state for two trainers and 30 fishermen/operators of BLCs.

Training of three trainers and about 150 fishermen/operators of BLC in use and maintenance of sail rigs

Not done. Interest of fishermen/BLC operators in such training is very limited.

Preparation of training material in use and maintenance of sail rig

Not done for above reasons.

Impact evaluation and reporting of BLC development and introduction

Postponed due to lack of suitable consultants. Scheduled for January/February 1991.

Unscheduled

Technical evaluation of construction of beach-landing craft. Report prepared for the impact evaluation mission.

Technical support to local engine manufacturers (VST and Greaves Cotton) in trials of engines, waterpumps and reduction gear box for BLC.

Assessment

The feasibility of beachlanding craft varies from low to high. The recent demonstrations of IND-20 in Tamil Nadu and increasing private ownership of BLC in Puri suggest that BLC, if privately owned, well equipped and operated in an efficient way to make the most of diverse fish resources, are economically viable.

BLC have been introduced or are, at times, operating in about 50 fishing villages. Introduction of BLC in so many villages, often without prior socio-economic study of fishing communities, seems to be one of the main reasons for economic failure and poor maintenance. Workshops with qualified mechanics and spare parts are not available in many of these remote fishing villages.

Beachlanding craft are built according to reasonably good boat-building practices by four private boatyards. The area of concern is mainly the propulsion system. Production of a good standard gearbox and waterpump for the water-cooled engine is a problem. For want of waterpump and gearbox, there are about 80 BLC lying in the APFC boatyard and production has come to a standstill. In order to improve the supply of engines and after-sales service, other manufacturers should be encouraged to introduce water-cooled engines (Lombardini) for BLC.

In view of the promising performance of the new retractable propulsion system of water-cooled VST engines — featuring step down reduction gearbox with chain and sprocket or toothbelt and pulley, instead of gearbox, and rubber bellows for inboard installation instead of engine box — these engines should be demonstrated for use with BLC.

Training of fisheries officers/trainers in operation and maintenance of BLC has failed. The Fisheries Department does not have any follow-up training programmes for fishermen/BLC operators. Training efforts should concentrate on training private mechanics and fishermen/operators.

Use of ice on board BLC permits longer voyages, wider range of operation and better preservation of fish for added value to catch. Insulated, built-in ice box should be incorporated in the BLC IND-20.

During the second year of operation of BLC in Thanjavur District, the viability of IND-20 fitted with water-cooled diesel engine has been reconfirmed. Counterpart staff and fishermen have been trained in management and operation of BLC. Further introduction of IND-20 in Thanjavur District and elsewhere will very much depend on availability of credit and terms and conditions to fisherfolk borrowers.

The main objective of the subproject has been achieved and it will therefore be terminated. The only remaining work is video documentation and the impact evaluation, which assessment will constitute the final report. These matters will be finalized early 1991 and recorded under Fishing Technology — General Services (FIT/GEN).

Su bproject : Flying Fish Fisheries, India (FIT/FFF/IND)

OBJECTIVES

Demonstration of flying fish fishing with gillnets. The fisherfolk 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 1989

The use of a specifically designed gillnet with a beachlanding craft (BLC) off Madras in 1988 revealed availability of large flying fish species (non-spawners) in commercial quantities from March to August. This experience provided justification to plan a subproject for the 1989 fishing season. However, because of non-availability of craft and personnel, no activities were carried out during the 1989 fishing season.

Targets 1990

Commercial fishing trials for large flying fish species

Achievements

Trials were conducted from mid-April to end July and demonstrated the viability of gillnetting for large flying fish. They also generated interest among local fishing communities at the end of the fishing season. One motorized large *kattumaram* was equipped with new gillnets of the same design as those used in the trials. A summary report will appear in *Bay of Bengal News No. 41*.

Evaluation and recommendation for follow up

The results clearly showed that this particular flying fish fishery is a viable option for BLC and similar craft during 4 - 6 months of the year. It is, however, not clear to what extent the traditional craft (*kattumaram*) can be employed in the fishery. It is therefore recommended that further trials with *kattumaram*, and a BLC for comparison, be undertaken during the 1991 season.

Assessment

Results of fishing with gillnets off Thirumullaivasal indicate commercial availability of large flying fish during four months of the year (April-July). It confirms the results of the 1988 fishing season off Madras.

The economic viability of large flying fish gillnetting with motorized BLC has been established. The earnings compare favourably with earnings from other fisheries carried out by motorized craft during the same period.

The feasibility of large flying fish gillnetting with large *kattumaram* is still to be proven.

Use of ice on board the craft is an important factor for extended range of operation and preservation of catch in good condition. It might, in fact, be necessary, in order to maintain competitive prices with landings of other popular species.

Targets 1991

- Commercial fishing trials of large flying fish with motorized BLC and large *kattumaram*.
- Training of fisheries field officers.

- Fishing demonstrations for fishermen and officers from other areas.
- Study of prices and demand of flying fish in relation to other important species.
- Analysis of results.
- Development of extension material.
- Reporting.

Future

- Further demonstrations and extension.

Subproject : Large Pelagic Species (FIT/LPS/IND)

OBJECTIVES	Demonstration of fishing for large pelagic species through use of driftnets and longlines. Intended beneficiaries are fisherfolk who operate BLC and similar, or larger, harbour-based boats. Successful implementation would lead to higher earnings and increased fish production from underexploited resources.
STATUS 1989	The subproject started in 1989. The rationale was 'largely based on the experiences of a similar fishery in Sri Lanka and on results of trials with BLC in India. A BOBP "multi-day" boat (SRL-15) was transferred from Sri Lanka. Fishing trials started from Chinnamuttam, but they were severely hampered by engine breakdown. To ensure sustained exploratory fishing, one more boat of the same type was ordered.

Targets 1990

Achievements

Delivery of a second boat	Done in July. A SRL-15 type of boat was built in Sri Lanka and transferred to India.
Study tour of offshore fisheries in Sri Lanka	A study tour was organized, but only one boat-builder from the private sector participated.
Commercial fishing trials to complete one full year's cycle	The first boat has been non-operational the whole year due to engine problems. Commercial fishing trials with the second boat commenced late July from Chinnamuttam, Kanyakumari district, Tamil Nadu and continued till the end of the year with encouraging results.
Preliminary evaluation of trials	Not done. Postponed till a full year cycle of trials has been completed.

Assessment

The technical problems with the engine of the first boat have been a serious setback, but, with a little bit of luck, both boats should be operating regularly from early 1991.

Multi-day offshore fishing for large pelagic species being new to the fishermen, there is need for good leadership by well experienced masterfishermen to ensure a sustained fishing operation and training of crew.

Targets 1991

- Commercial fishing trials till at least August.
- In-service training of fishermen in operation and maintenance of offshore boats.
- Reporting with recommendations for follow-up.

Future

- The follow-up will depend on the outcome of the trials and the recommendations.

Subproject : Outrigger Canoes, Indonesia (FIT/ORC/INS)

OBJECTIVES

Development and demonstration of plank-built outrigger canoes as alternative to traditional fishing craft in order to increase incomes of fisherfolk and production of underexploited resources. The target group are the fisherfolk of Nias Island, almost all of whom are small-scale operators employing small traditional craft of limited capacity and range.

STATUS 1989

Three plank-built motorized outrigger canoes, 6.7, 8.0 and 9.7m, had been constructed in Gunung Sitoli, Nias Island, and local carpenters/boat-builders were trained.

Fishing trials in cooperation with small-scale fishermen of the East Coast of Nias was started. The trials of the small and medium sized canoes were mainly done in inshore areas employing hook-and-line methods. The large canoe employing driftnets was mainly operated in more offshore areas to catch large pelagic species. The initial experiences of the trials were :

- The small canoe had problems with the performance of the air-cooled petrol engine.
- The medium canoe performed well and was accepted by the fishermen.
- The large canoe performed well technically, but the fishing results were poor due to low availability of large pelagic species. The fishermen also felt it had too low speed and carrying capacity.

For extending endurance at sea and improved preservation of the catch, removable insulated ice

boxes were made for the canoes. This resulted in extended and much-improved fishing operations for hook-and-line fishing.

Socio-economic profiles of selected fisherfolk communities were under preparation.

Targets 1990

Report on design, construction and testing of outrigger canoes

Completion of socio-economic profile of selected fisherfolk communities

One year of commercial fishing trials

Video film

Dissemination of positive results

Evaluation and recommendations for follow-up

Achievements

Done. It will be published as BOBP/WP/77

Done for 11 fishing villages. The profile :

- Provided a good overall picture of the socio-economic conditions of the fishing villages.
- Identified some problems, needs and aspirations of the small fisherfolk in both fisheries and other sectors.
- Provided useful information as regards existing potential in coastal areas.
- Identified fisherfolk communities where introduction of new outrigger canoes might be feasible and desirable.

The outcome will be published as BOBP/WP/78

14 months completed for the medium sized canoe and 9 months for the large one in Gamo on the northeast coast of Nias. The trials with the small canoe were discontinued because of unsatisfactory performance.

The two larger canoes have performed very well – technically as well as economically. One of the reasons for this is very close supervision and on-the-job training in management of small fishing units by a dedicated field worker. The fishermen groups have been encouraged to save money from their substantive earnings. The amount saved during the year is in the order of US\$ 1000 for each group.

Postponed till 1991.

Initiated. Field visit by fisherfolk from other fishing villages organized. Interest in new outrigger canoes generated.

The two larger canoes have both proven to be suitable craft for the hook-and-line fishery they have been engaged in. An even better alternative would be an intermediate size, 8.6 m, with a 6.5 hp engine (same as in the large canoe). The small canoe is not viable; it is too small for the long trips required. The use of an ice box on board to preserve the fish is an essential element of the hook-and-line fishery.

	It is proposed to build at least two new intermediate canoes for the two groups of cooperating fishermen. The savings made will be sufficient for the hull. The engine could be acquired through BOBP guaranteed credit from the supplier. The existing two canoes should be used for further demonstration in other villages.
Preparation of an extension phase, if appropriate	Not done, but discussions have been initiated with fisheries authorities, banks and engine manufacturers about the possibilities of obtaining credit – without which it will not be possible to create a fleet of new outrigger canoes.
Unscheduled	Design of the new 8.6 m version of the outrigger canoe for coastal hook-and-line and gillnet fisheries. Study tour of offshore fisheries and development of small craft in Sri Lanka and India by a Fisheries Officer (PFS).

Assessment

The feasibility of the new motorized outrigger canoes employing hook-and-line in the coastal zone has been proven. Scope for increasing the earnings of fisherfolk has been demonstrated. The main objective of the subproject has therefore been met.

The use of ice, not considered a necessity at the outset of the subproject, has permitted longer fishing voyages and a remarkable expansion in the range of operation. This has contributed very significantly to the success of the fishing trials.

The lack of credit for the small-scale fishermen to gain access to new motorized outrigger canoes is a major problem.

The fishing trials have been limited to one fishing village on the northeast coast and results may therefore not be valid for those areas on the west coast for which the outrigger canoes were also intended.

Targets 1991

- Technical and financial support for construction of two or three new canoes in Gamo.
- Training of local carpenters in canoe construction at village level.
- Continuous monitoring of fishing operations of new canoes in Gamo and assistance as required.
- Assessment of access to financing schemes by small-scale fisherfolk.
- Fishing demonstrations of existing prototype canoes in a “new” village.
- Transfer of prototype outrigger canoes to fisherfolk.
- Field visits to Gamo by fishermen of other villages in Nias to get exposure to development of outrigger canoes.
- Video film and slides.

Future

- Monitoring of new canoes in Gamo to complete a full year cycle,
- Preparation of scheme for further introduction of new canoes,
- Reporting.

FISHERY RESOURCES

The work programme in 1990 covered, in essence : the *Kattumaram* Fisheries in India and Set Bagnet Fisheries in Bangladesh; a regional meeting and regional workshop on bio-economics of small-scale fisheries; and ad hoc services and support to other subprojects of the BOBP.

After completion of the investigations in 1989 into resources, and the technological, socio-economic and marketing aspects of the *kattumaram* fisheries in Kothapatnam, Andhra Pradesh, limited amount of fishing trials were conducted in 1990. These trials indicated that the performance of large *kattumaram* can be improved through certain innovations of gear, fishing in deeper waters and changes in operational techniques, including motorization. Such possibilities do not seem to exist for small *kattumaram* which, therefore, do not offer opportunities for improving the livelihood of the fisherfolk using them. Three methods of fishing may have to be adopted by large *kattumaram* for a reasonably even income throughout the year. BLC should move out of the *kattumaram* fishing range, closer to where the *navas* are operating extremely successfully. Households of small *kattumaram* owners and crew members are primarily the ones with income at, or below, the poverty line.

The surveys of set bagnets and other relevant fisheries in Bangladesh were completed at the stations. Data are being processed. The socio-economic assessment started in the second half of 1990 and will be completed by the first quarter of 1991.

The agenda of the regional meeting and the workshop on bio-economics included evolution of bio-economics, bio-economic models, parameters for bio-economic assessments, estimation of these parameters, data requirements for such estimations, identification of bio-economic case studies and preparation of proposals and workplans for these case studies.

Among the other services extended, major inputs were provided for the “Biological aspects of by-catch in shrimp trawl fishery in India”, development of communication media (comics) on fisheries resources and management, IBM versions of the “Bay of Bengal Fisheries Information System” and “Bhattacharya’s method and its applications to fish population analysis”, and a TCP project proposal for “Exploratory fishery for large pelagics in Bangladesh”.

It is anticipated that the FAO/UNDP project “Bio-economics of small-scale fisheries” will become operational from 1991. The resources aspects of the Programme will then be covered under that project. Failing this, consideration should be given to maintain fishery resources under RAS/ 118/MUL and take up some of the high priority issues of bio-economics during the remaining period of the project.

Subproject : General Services (RES/GEN)

Targets 1990

Proposal for large pelagic fishery development in Bangladesh

Achievements

A draft project document proposing one year of commercially-oriented test fishing, using a private boat under charter arrangement, was prepared and submitted to the Government of Bangladesh.

Biological aspects on shrimp trawl by-catch on the east coast of India.	Basic assessments of quantity and composition were carried out. Results are summarised in an article in <i>Bay of Bengal News No. 40</i> .
Analysis, reporting and presentation of results on <i>kattumaram</i> fisheries in India	Analysis completed and a draft report prepared (BOBP/WP/70). Results of the study formed the background material for the development of communication media (comics) on certain aspects of fisheries management.
Regional meeting to discuss bio-economic activities and identify case studies	Conducted in May 1990, with the participation of Bangladesh, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. Concept and evolution of bio-economics, existing models and identification of case studies were dealt with.
Initiating case studies by conducting field investigation and data collection	A workshop was conducted in October 1990 with the participation of the six countries mentioned above. Detailed workplans for the case studies were drafted, estimation of parameters for bio-economic assessment and data collection discussed and usage of bio-economic analytical programme demonstrated.
BOBP Workshop on Artificial Reefs in Thailand	A national workshop was conducted in Phuket, Thailand, in November 1990 with some 30 participants to address the progress made during pre-and post-deployment surveys of artificial reefs, impact of the artificial reefs on the fisheries and fisherfolk, and improvements to future surveys for bio-economic assessment.
Reimbursable support to the Reef Fishery Project in the Maldives	Done. See the report on "National projects implemented through BOBP".

Subproject : Set Bagnets Fisheries, Bangladesh (RES/SBN/BGD)

OBJECTIVES

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/brackish-water catch.

STATUS 1989

Preliminary investigations in 1987 indicated that the set bagnet fisherfolk are extremely poor and that the fishing results in heavy exploitation of juvenile fish and shrimp. After Government clearance the subproject commenced mid-'89. Sampling sites were then selected, frame surveys conducted, biologist trained, forms and questionnaires prepared and equipment obtained. The biological survey commenced at six stations in the third quarter of 1989.

Targets 1990

Continuous catch sampling of set bagnets, trammelnets and pushnets

Compilation of information on trawl catches of relevant species from past surveys and commercial catch records.

Compilation of data on export of cultured shrimp

Assessment of socio-economic aspects of the set bagnet fishery

- Introduction of questionnaires
- Village profile and frame survey
- Basic household survey
- Periodic survey of changes in the villages

Assessment

Biologists and socio-economists have been working enthusiastically and systematically. The voluminous data collected are being manually processed and periodically reviewed. Commencement of socio-economic survey was delayed due to delay in the assignment of personnel. Consequently,

Achievements

Progressed satisfactorily and data were processed manually for estimating catch rates, species composition, size composition, and prices of species for each type of gear in the six locations. Significant differences between stations were observed in all parameters. The pushnet catches are being sampled to estimate mortalities of shrimp and finfish larvae during shrimp seed collection.

The work was delayed due to lack of personnel. It will be completed in the first quarter of 1991.

Satisfactorily completed. The data include species, method of production, tonnage by size, grades and seasons, for 1987 and 1988. This information is to supplement the information on shrimp seed collection from studies for the estimation of shrimp seed and finfish fry collected in Bangladesh and to compare with the quantities of the respective species taken by set bagnet nets in the estuaries.

Socio-economists were trained for the survey.

Questionnaires were prepared and pilot tests conducted in two villages, other than the selected stations, by a socio-economist to familiarize the staff on the survey methodology and to test the questionnaires.

Completed in all six stations and draft report prepared. Significant differences were observed in the ownership pattern of set bagnets and other gear and craft at the various locations. Very few other income-generating activities seem to be practised by set bagnet fisherfolk.

Completed and draft report prepared. Number of households in each of the six villages varied from 30 to 400.

In the first survey of changes in the last quarter it was observed that the large set bagnets started shifting from the estuary to the marine sector. Set bagnet fishermen in some areas commenced seasonal gillnet fishery for hilsa. Seasonal difference in income from set bagnet was apparent.

the bio-economic survey will be completed ahead of the socio-economic survey. Therefore, periodic biological investigations will be conducted along with the surveys of the seasonal changes in the socio-economic conditions of the villages.

Seasons and areas of abundance of not only penaeid shrimp larvae and juveniles but also of other commercially valuable finfish species and freshwater prawn are emerging from the study. Reliability of the estimation of the number of set bagnets operated in the estuarine sector may be a limiting factor in the final assessment.

Targets 1991 (under the Bio-economics project – RAS/89/037)

- Assessment of mortality rates of shrimp seeds during transport and culture.
- Completion of socio-economic survey of changes.
- One or two checks on SBN catches to correspond with the socio-economic survey of changes.
- Census of trammelnets in SBN survey areas 1 & 2.
- Assessment of quantities of large sized croakers caught by longline for export.
- Marketing study of SBN catches.
- Investigation of SBN behaviour through field observations and by tank tests.
- Acquisition of computer and training in computer usage for data processing.
- Analysis and reporting.
- National seminar.

DEVELOPMENT SUPPORT

The principal areas of work under Development Support have been the preparation of development projects for Sri Lanka and Bangladesh and the implementation of the subproject on Fisherfolk Credit in Sri Lanka.

Some of the other work was hampered due to the delay in filling the post of Development Adviser till August.

The training course in Project Preparation could not be held as planned as it was to be part of a similar training course planned by the FAO in collaboration with SEAFDEC and this course had to be postponed.

In the case of project formulation work, the progress was satisfactory and there are good prospects of some of the proposed projects being taken up for implementation in the future.

The Fisherfolk Credit subproject has, after a prolonged period of preparation, reached the stage of concrete proposals for credit. These will be considered by the banks early next year.

During the coming year, the major areas of work will be : the promotion of the already identified projects and proposals and, possibly, the preparation of new ones, e.g in the Maldives; training in project preparation; support to fishing technology activities by promoting credit; updating of country descriptions of their fisheries and possibly other measures to improve the data base; a comparative study of fishing systems to assess their relative merits; and to update the economic results relating to technical activities in order to determine the possibility of extension and replicability of such activities.

***Subproject : Preparation and Promotion of Small-scale Fisheries
Projects and Ad Hoc Services (DEV/GEN)***

Targets

Achievements

Elaboration of project proposals for West Bengal

Six project proposals which were formulated in 1989 were discussed with the State Government. Two of the projects viz. "Better utilization of trash fish" and the "Development of the export-oriented jew fish fishery" were given priority by the State Government and were referred to the Post-Harvest project which will follow it up early 1991. A description of the West Bengal small-scale fisheries has been published (BOBP/INF/11).

Proposals for non-formal primary education in Andhra Pradesh

A project proposal was formulated and presented to the State Government. It envisages the setting up of 240 education centres with the help of a well-established NGO.

Fact-finding study on resources and utilization of carpet clam in Malaysia

Not done. The Department of Fisheries decided to do the study themselves.

Study on effects of shrimp trawling on small-scale fisheries

It was not possible to undertake any work during the year, but some preliminary planning was done with a view to undertaking it in 1991.

Training in project preparation

This training programme, originally scheduled for 1989, was not implemented for various reasons explained in last year's report. It was reinstated in 1990 according to the wishes of the Advisory Committee. It is being organized together with FAO and SEAFDEC. It was not possible to conduct the course during the year for reasons beyond the control of BOBP. It is now fixed for 8 July - 1 August, 1991.

List of externally supported-projects

The list has been updated and will be issued in January 1991.

Preparation of plans and projects in Bangladesh and Sri Lanka

BOBP participated in a FAO/UNDP mission to formulate development proposals for inclusion in the Sri Lanka UNDP Country Programme. Five proposals covering marine fisheries were outlined. Three of them deal with Small-scale fisheries viz. "Management of coastal fisheries", "Demersal fisheries" and "Landing places", while the other two concern offshore and oceanic fisheries.

A mission was sent to Bangladesh in the 4th quarter to identify development projects for marine and brackishwater fishing. Three project proposals were outlined. They concern "Marine fisheries management", "Socio-economic uplift of communities" and "Development of brackishwater culture".

Follow-up of proposal for small-scale offshore fishing, Tamil Nadu, India	Government reaction is awaited.
Promotion of credit for beachlanding craft, India	A seminar-cum-field visit was organized for bank officers to meet fishermen and to observe the beachlanding craft. It has subsequently been found that, due to the difficulty of getting the fisherfolk to provide collateral, credit has not materialized up to now.
Economic analyses of BOBP activities	This work is done, on a routine basis.
General descriptions of fisheries	Not done, since no requests for assistance received.
Reimbursable support to other projects – sector study – MDV	BOBP did not participate in this sector study as envisaged earlier.

Targets 1991

- Training in project preparation (in collaboration with FAO and SEAFDEC).
- Comparative study of fishing systems.
- IMO-assisted project for cleaner fishery harbours,
- Follow-up of development proposals in Sri Lanka, Bangladesh, India.
- Updating of fisheries information material as requested by Governments.

Subproject : Fisherfolk Credit, Sri Lanka (DEV/FFC/SRL)

OBJECTIVES

Introduction of a non-subsidised credit scheme under the banks' normal lending programmes for small-scale fishery, fishery-related activities and other economic activities in order to increase the income of fisherfolk and their families.

The target group of the subproject is small-scale fisherfolk, particularly owner/operators of small craft, labourers and women from the fisherfolk communities in the districts of Puttalam, Galle and Matara who have no, or limited, access to credit.

STATUS 1989

The project commenced in 1988. Due to the disturbed situation in the project area the inventory and socio-economic study of fisheries and the study of economic activities of fisherfolk could not be completed in 1989 as planned. The socio-economic study was scaled down to a 25% sample of the fishing villages selected and the field work was completed during that year. Arrangements had been made to conduct the following three studies – an inventory of the past and present fisheries credit schemes, strategy on the marketing of credit, and training needs of bank branch staff.

Targets 1990

Inventory of existing fisherfolk-oriented credit schemes and their status

Training of bank staff in economic and financial analysis of small-scale enterprises

Implementation of cost and earnings studies of economic activities of fisherfolk.

Briefing of senior Bank/Ministry officers on the activities and the economic and financial analysis of small-scale enterprises

Analysis of training needs of bank branch and HQ staff to improve management and bank-client relationship

Study on how to improve strategy for credit marketing

Inventory of socio-economic data of fisherfolk communities

Study tour to Orissa, Bombay (NABARD) and Bangladesh (Grameen Bank)

Design of credit schemes, credit flow strategy, banking plan and monitoring mechanism

Achievements

This has been completed and summaries were made available in Sinhala, English and Tamil for distribution among the field officers of the Ministry. The study showed that there were ten different schemes of fisheries credit in the past decade, most of which failed either totally or partially due to improper borrower selection, inadequate monitoring and supervision, insufficient exposure of bank's staff to fisheries etc.

Bank officers were provided training at two residential workshops. The training proved to be very useful in the conduct of the survey and the processing of data.

The studies were conducted by the bank officers during May and June, and 37 small economic activities were identified for bank support in the project area.

This was not held since the information was not available on time. The briefing will be held in the first quarter of 1991 in connection with the finalization of the credit scheme.

The analysis has been completed and the study recommends a five-module programme targeted at the branch personnel of the banks in the project area.

The study was completed and the result was used in drawing up the credit scheme. The study recommends the adoption of new strategies, such as the use of field assistants from the village, mobile banking service etc.

Ail output tables were finalized. A summarized data sheet has been prepared and the report of the survey was presented to the Ministry and the banks. The survey has resulted in very useful data for fisheries planning and management purposes. The data will be published as BOBP/INF/12.

Nine persons representing the state banks, the Central Bank/RRDB and the Ministry participated in the study tour to India. The visit to the Bangladesh Grameen Bank had to be called off.

An Interagency Committee set up to formulate the scheme completed its work by the end of December and the scheme will be presented to the banks/Ministry in January 1991.

Assessment

The subproject, which was considerably delayed due to difficulties in conducting field work, made good progress during the year. Particularly noteworthy achievements are the improved working relations between the Ministry and the bank, the availability of much needed socio-economic data on the fisheries sector, and the exposure given to the bankers of the fisheries situation, which has enabled them to better appreciate the needs of fisherfolk. The scheme, if cleared by the banks without delay, could be implemented from second quarter 1991.

Targets 1991

- Regular monitoring of the credit scheme and on-line refinement.
- Training of bank officers involved in scheme's implementation.
- Publicity programme.
- Report on the scheme preparation.

Future

- Monitoring of scheme implementation.
- Dissemination of the experience among the BOBP countries.

INFORMA TION SERVICE

The Newsletter, Bay *of Bengal* News, completed its tenth year of uninterrupted publication at the end of 1990 with its 40th issue. The popularity of the Newsletter is reflected in the ceaseless demand from within and outside the region for inclusion in its mailing list. The Newsletter could perhaps be made even more valuable and interesting if scientists and planners from member-countries contributed more articles and ideas on their own, on subjects relevant to small-scale fisheries.

As for publications, the book on "People's Participation", which discusses and analyzes the many activities of the subproject conducted during 1986-87 with special SIDA funding, was out late 1990. Much effort went into writing, editing and producing this book. Feedback is awaited from member countries on the usefulness of it.

Eight reports, working papers and information documents were out during the year. This is less than anticipated. There is a small backlog in the Information Service, but many more papers are still under preparation in the technical units.

A simple four-page brochure was brought out on activities in Indonesia. A series of extension pamphlets on post-harvest technology was begun with a pamphlet on the use of ice with naval in India. These are also planned in local languages (Telugu and Tamil).

To enable greater professionalism in video production, up-to-date editing equipment was acquired and used for video films made in-house. Apart from these, films were also made on contract by private media firms and by counterpart agencies. Half a dozen films made during 1990 are listed in the table below.

A new audio-visual was made on the work BOBP has done during the past 11 years. Though fast moving — because it condenses several hundred activities into 15 minutes — it is valuable as visual documentation.

During the next two years, before the end of the project, many reports and video films should be produced. To cope with the workload, as much as possible will be subcontracted locally to private firms and organizations.

Targets 1990

Achievements

Four issues of *Bay of Bengal News*

Done, totalling 108 pages.

Technical reports and manuals
(about 15)

Eight reports, working papers and information documents produced during the year, as follows :

BOBP/REP/44 : Report of the fourteenth meeting of the Advisory Committee

BOBP/REP/45 : Report of a seminar on *Gracilaria* - production and utilization in the Bay of Bengal

BOBP/REP/46 : Exploratory fishing for large pelagic species in the Maldives

BOBP/WP/61 : Development of outrigger canoes in Sri Lanka

BOBP/WP/62 : Silviculture project in Sunderbans, West Bengal

BOBP/WP/63 : Shrimp seed collectors of Bangladesh

BOBP/INF/10 : Bibliography on *Gracilaria*

BOBP/INF/11 : Marine fisheries of West Bengal: An introduction

Book on people's participation in fisherfolk development. Title : "Helping Fisherfolk to Help Themselves".

Desk calendar

Done.

Video films on subprojects

Six films were produced during the year.

- Helping self-reliance among fisherfolk in North Sumatera, Indonesia
- Fisherwomen of Besant Nagar : A new market, a new identity.
- Outrigger canoes of Sri Lanka (made on contract by Worldview International Foundation, Sri Lanka).
- Oyster culture in Malaysia (by the Fisheries Research Institute, Glugor Penang).
- Integrated extension services in Ranong, Thailand (by the Ranong subproject).
- Nursery cage culture of penaeid prawns at Magnapara, Bangladesh, made on contract by Sound and Vision Extension (SAVE), Bangladesh.

Briefing documents on important subjects/issues

Brochure prepared on BOBP-supported activities in Indonesia.

Unscheduled	Extension pamphlets on post-harvest fisheries activities
	– Use of ice in navas (English and Telugu)
	– Use of ice onshore (English)
	New audio-visual on BOBP which summarizes the past and ongoing work of BOBP.

Targets 1991

- Newsletter *Bay of Bengal News* - 4 issues
- Reports – about 20 working papers and reports
- Video films – about half a dozen on various activities
- Extension brochures and manuals.

PROJECT INPUTS AND THEIR UTILIZATION

The budgets and estimated expenditures for the three projects are as follows:

<i>Project</i>	<i>Budget 1990</i> <i>(US \$)</i>	<i>Est. Exp. 1990</i> <i>(US \$)</i>
GCP/RAS/118/MUL	2,027,220	1,924,468
GCP/RAS/ 117/MUL	–	120,789
GCP/RAS/126/AGF	150,000	146,607

(Further details are given in Table 1.)

Extension work accounts for 27% of the expenditure, Brackishwater Culture 21%, Fishing Technology 18%, Fishery Resources 13%, Development Support 12% and the Information Service 9%.

A new Development Adviser was recruited in the middle of the year to fill the vacant post. Arrangements have also been made to fill the Socio- Economist post from early 1991. It is therefore hoped that GCP/RAS/118/MUL will be fully staffed for the remaining period till 1992.

Several Associate Professional Officers left the programme during the year. One of them, the Socio-Economist in India, has been replaced by a new incumbent. An Economist and a Fishing Technologist are also under recruitment and are expected to arrive in the early part of 1991. A few posts have been cancelled since there are no possibilities of recruiting new incumbents in time for meaningful employment, considering that the concerned subprojects will be terminated during 1992.

Details of professional staff and consultants are given in Table 2. The supporting staff employed at the end of 1990 are listed in Table 3.

Major expenditures under subcontracts were incurred for : construction of small-scale *macrobrachium* hatchery for prawn seed in Bangladesh; broadcasting services for the fisherfolk radio programme in Sri Lanka; field workers on the oyster subproject in Malaysia; for printing reports and working papers; and for temporary assistance to the Information Service.

Major expenditures incurred by way of materials were : stationery and other office supplies; materials for large pelagic species project in Tamil Nadu; and photographs/audio visuals and books for the library.

Major expenditures in equipment were : purchase of motorcyces for fisheries extension development in Bangladesh; hatchery and tank building for prawn seed project in Bangladesh; an additional boat for large pelagic species project in Tamil Nadu; video multi-effect system for the Information Service; and vehicle and computer.

Details of the organized training activities are given in Table 4. The AGFUND project RAS/126/AGF, has contributed US\$0. 15 million and the balance US\$ 0.15 million has been met by RAS/118/MUL. The total training time is in the order of 30 man-years. The training courses are all national and primarily for extension staff and fisherfolk. One regional consultation on extension and two dealing with bio-economics were organized. Four regional gatherings are planned for 1991 and the training activities, in general, are anticipated to exceed those of 1990.

Table la
GCP/RAS/118/MUL — Budget and Expenditures (in US \$)

Code	Object of Exp.	Total 1987-92	Act. Exp. 1987-89	Budget 1990	Est. Exp. 1990	Balance 1991-92
10	Personnel	2,851,120	1,911,199	862,000	939,921	
20	Duty Travel	588,300	414,466	184,000	173,834	
30	Contracts	605,724	463,565	175,000	142,159	
40	Gen. Op. Exp.	283,743	216,191	100,000	67,552	
50	Materials	358,790	266,258	143,000	92,532	
60	Equipment	487,114	347,362	140,000	139,752	
80	Training	417,870	270,551	190,000	147,319	
	SUB-TOTAL	5,592,661	3,889,592	1,794,000	1,703,069	
90	Servicing Cost	727,046	505,647	233,220	221,399	
	Unallocated	4,163,607				4,163,607
	GRAND TOTAL	10,483,314	4,395,239	2,027,220	1,924,468	4,163,607

Table 1b
GCP/RAS/117/MUL — Deposits and Expenditures (in US \$)

Code	Object of Exp.	Deposits 1987-90	Actual Exp. 1987-89	Estimated Exp. 1990	Balance 1991
10	Personnel		126,700	111,529	
20	Duty Travel		263		
40	Gen. Op. Exp.		19	3,500	
50	Materials		18	8	
	SUB-TOTAL		127,000	115,037	
90	Servicing Cost		6,350	5,752	
	GRAND TOTAL	326,609	133,350	120,789	72,470

Table 1c
GCP/RAS/126/AGF — Budget and Expenditures (in US \$)

Code	Object of Exp.	Total 1990-92	Budget 1990	Act. Exp. 1990	Balance 1991-92
40	Gen. Op. Exp.	1,511		1,511	
60	Supplies & Equipment	2,025		2,025	
80	Training	126,205	132,743	126,205	
	SUB-TOTAL	129,741	132,743	129,741	
90	Servicing Cost	16,866	17,257	16,866	
	Unallocated	253,393			253,393
	GRAND TOTAL	400,000	150,000	146,607	253,393

Table 2**Professional Staff - 1990 – GCP/RAS/118/MUL & GCP/RAS/117/MUL***INTERNATIONAL OFFICERS*

Post	Name of Incumbent (country)	Date of (month/year)	
		Arr.	Dep.
1. Programme Director	Engvall, L O (Sweden)	01/87	
2. Development Adviser	Fernando, C (Sri Lanka)	08/90	
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. Information Officer **	Madhu, S R (India)	01/87	
7. Fishery Biologist	Sivasubramaniam, K (Sri Lanka)	05/87	
8. Masterfisherman	Gallene, J (France)	03/88	
9. Craft Specialist (Ass. Prof. Officer)	Andersen, M (Denmark)	04/89	
10. Fishery Biologist (Ass. Prof. Officer)	Degel, H (Denmark)	06/89	06/90
11. Training Officer (Ass. Prof. Officer)	El Gendy, (Ms) G (Netherlands)	03/88	06/90
12. Socio-Economist (Ass. Prof. Officer)	Haglund Heelas, (Ms) A M (Sweden)	10/90	
13. Economist (Ass. Prof. Officer)	Jepsen, F (Denmark)	03/89	03/90
14. Socio-Economist (Ass. Prof. Officer)	Jungeling, (Ms) I (Netherlands)	07/90	
15. Aquaculturist (Ass. Prof. Officer)	Kalkman, B (Netherlands)	03/88	03/90
16. Marine Engineer (Ass. Prof. Officer)	Karlsson, R (Sweden)	02/88	02/90
17. Sociologist (Ass. Prof. Officer)	Kristensen, (Ms) H (Denmark)	10/88	
18. Fish Technologist (Ass. Prof. Officer)	Kristensen, (Ms) J (Denmark)	02/89	02/90
19. Economist (Ass. Prof. Officer)	Lindeblad, B (Sweden)	03/89	03/90

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

Post	Name of Incumbent (Country)	Date of (month/year)	
		Arr.	Dep.
20. Socio-Economist (Ass. Prof. Officer)	Lundqvist, -(Ms) C (Sweden)	03/88	03/90
21. Aquaculturist (Ass. Prof. Officer)	Nielsen, H B (Denmark)	10/88	
22. Fishing Technologist (Ass. Prof. Officer)	Nystrom, U (Sweden)	11/88	07/90
23. Sociologist (Ass. Prof. Officer)	Townsley, P (Canada)	08/87	08/90

NATIONAL OFFICERS

1. Sociologist	Burankanonda, A (Thailand)	09/90	
2. Radio Officer	Fernando, M (Sri Lanka)	11/90	
3. Programme Officer	Joseph, L (Sri Lanka)	07/87	
4. Programme Officer	Kashem, A (Bangladesh)	01/87	
5. Radio Officer	Nelson Jayaweera, H (Sri Lanka)	11/88	06/90
6. Marine Engineer	Ramesh, V (India)	02/88	
7. Sociologist	Ratsuvom Pidapayon (Thailand)	11/89	06/90

INTERNATIONAL CONSULTANTS

			man-months
1. Production of shrimp seed in West Bengal (IND)	Chavez, M J (Philippines)		1.75
2. Offshore safety (SRL)	Dahle, E (Norway)		0.75
3. Boat development and construction (INS, SRL)	Gulbrandsen, O (Norway)		1.9
4. Rapid Rural Appraisal (IND)	McCracken, (Ms) J (UK)		0.75
5. Evaluation and Training Radio Unit (SRL)	Pickstock, M (UK)		1.50
6. Reporting on Extension (INS)	Townsley, P (Canada)		2.00

Table 3**Supporting Staff - 1990 — GCP/RAS/118/MUL & GCP/RAS/117/MUL****ADMINISTRATION (Madras)**

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

INFORMATION SERVICE (Madras) * *

Vijayakumar, K	Videographer/Photographer
Joseph, (Ms) C	Documentalist
Amalore, E	Artist/Draughtsman
Jayaraj, S	Artist
D'Costa, (Ms) G	Secretary

SECRETARIAL SERVICE (Madras)

Gordon, (Ms) P	Secretary
Jayakumar, (Ms) E	Secretary
Narcis, (Ms) P	Secretary
Vincent, (Ms) C	Secretary

NATIONAL OFFICE (Dhaka)

Ekram, (Ms) Z	Secretary
Syed, Nural H I	Typist
Kabir, A Q	Driver
Miah, Md. Majnu	Driver

NATIONAL OFFICE (Colombo)

Kelaart, (Ms) C	Secretary
Jayatilaka, (Ms) D L J	Secretary
Premaratne, A D	Driver
Rohana Pieris, P	Driver
Ranjith, A D	Messenger-

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

Table 4
Training Activities - 1990 — under GCP/RAS/118/MUL and GCP/RAS/126/AGF

S. No.	Title	Duration (days)	Venue	No. of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
1.	CONSULTATIONS/SEMINARS/WORKSHOPS									
1.1	Fisheries extension — for senior extension and planning officers.	3	Medan (Indonesia)	2	2	4	2	2	3	3
1.2	Small-scale offshore fisheries — for staff of Minfish, boatyards, banks, insurance companies, NGOs etc.	2	Negombo (Sri Lanka)	1	2	—	1	—	80	1
1.3	Bio-economics : Identification of case studies — for senior biologists and economists.	4	Penang (Malaysia)	2	—	2	4	2	2	2
1.4	Bio-economics : Preparations of plans for case studies — for senior biologists and economists.	10	Penang (Malaysia)	1	—	2	7	2	2	2
1.5	IPFC symposium on artificial reefs and FAD's — for scientists.	7	Colombo (Sri Lanka)	—	—	1	1	1	—	1
1.6	Economics of beachlanding craft in Tamil Nadu — for fisheries and bank officers.	1	Sirkali		25					
1.7	Income generation by women in coastal fishing communities of Tamil Nadu by use of link workers — for staff of DOF and NGOs.	2	Madras		18					
		4	Colombo						26	
1.8	Cost and earnings of economic activities — for bank staff.									
1.9	New outrigger canoes and credit needs — for staff of Minfish and banks.	1	Doddanduwa						12	
1.10	Consultation on fisheries extension — for staff of Minfish and fisherfolk NGOs.	3	Colombo						35	
1.11	Consultation on safety of offshore fishing boats — for staff of Minfish, boatyards, banks, insurance, boatowners and fishermen.	1	Negombo						40	

S. No.	Title	Duration (days)	Venue	No. of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
1.12	Review and analysis of findings of cost and earnings study — for bank officers.	3	Maharagama							28
1.13	Artificial reefs — for scientific/technical officers.	3	Phuket							35
2.	TRAINING COURSES									
2.1	<i>Macrobrachium</i> hatchery management — for DOF Staff (and one NGO).	35	Cox's Bazar	3						
2.2	Orientation on freshwater fish culture — for field staff of DOF and NGOs.	4	Bangladesh	24						
2.3	Socio-economic survey of set bagnet fisherfolk — for DOF socio-economists.	8	Chittagong	6						
2.4	Fisheries data processing techniques — for DOF biologists.	6	Bangladesh	12						
2.5	Marine diesel engine operation and maintenance — for fishermen.	7	Bhola	100						
2.6	Group mobilization and support — for staff of DOF and NGOs.	5	Patuakhali	26						
2.7	Participatory planning, project appraisal, implementation and monitoring — for staff of DOF and NGOs.	4	Patuakhali	26						
2.8	Organization and administration of fish market — for fisherwomen.	6	Madras		35					
2.9	Nursery pond management — for shrimp seed collectors.	7	Kakdwip		40					
2.10	Organization/management of nursery operation of tiger shrimp seed in cages — for fisherfolk.	4	Ramnagar		24					
2.11	Operation and maintenance of beachlanding craft — for trainers, mechanics and fishermen.	6	Tenkaichetpulam		30					

S. No.	Title	Duration (days)	Venue	No. of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
2.12	Fabrication of dipping lug sail -for sailmaker.	5	Kakinada		1					
2.13	Operation of fishing boat and gear – for fisheries officers and fishermen.	30	Chinnamuttam		5					
2.14	Fish processing – for fishermen and fisherwomen.	2	N.Sumatera			111				
2.15	Management of fishing units (outrigger canoes) – for fishermen.	30	Gamo			6				
2.16	Management of group enterprises – for PFS and EXT service staff.	30	Jakarta			3				
2.17	Oyster farming for fisheries agents.	4	Pulau, Sayak				21			
2.18	Oyster farming – for fisherfolk.	3	Pulau, Sayak				15			
2.19	Programing and interviewing – for Radio Unit staff.	5	Colombo						5	
2.20	Construction of timber outrigger canoe – for carpenters.	5	Balapitiya						2	
2.21	Construction of outrigger canoes for carpenters.	90	Doddanduwa						4	
2.22	Story development and interviewing techniques – for fisherfolk radio producers.	14	Sri Lanka						5	
2.23	Cost/benefit analyses – for project staff.	2	Ranong							8
2.24	Sewing – for fisherwomen.	1	Khajadphai							15
2.25	Food processing – for women.	24	Ranong							11
2.26	Crochet work – for women.	6	Khao Nang Hong							16
2.27	Squid trap making – for fisherfolk.	2	Ranong							13
2.28	Food processing and preservation – for women.	10	Ranong Province							135
2.29	Training in extension methodology – for staff of PFO, NFE and Health and Community Development Dept.	2	Ranong							19
2.30	Oyster spat collection and larvae identification – for project staff and fisherfolk.	5	Prachuab-kirikhan							3

S. No.	Title	Duration (days)	Venue	No. of Participants							
				BGD	IND	INS	MAL	MDV	SRL	THA	
2.31	Crab trap making – for fisherfolk.	4	Nakha								6
2.32	Needlecraft – for fisherwomen.	4	Samnak								23
2.33	Petrol fund management – for village members.	3	Khor Sinhai								30
2.34	Library management – for project staff.	4	Phuket								1
2.35	Food processing – for women.	18	Ranong Province								140
2.36	Fish cage culture – for fisherfolk.	2	Laun/Kaper								60
2.37	Sewing training – for women.	18	Hingchang								15
2.38	Cooperative introduction of aquaculture, food processing and net mending – for school children.	2	Kor Sinhai								68
2.39	Fishing legislation, traditional fishing gear, boat, engine repair and maintenance – for fisherfolk.	3	Kor Sinhai								24
2.40	Fishing legislation and cooperatives – for fisherfolk	1	Kor Sinhai								103
2.41	Shrimp and fish cage culture, oyster culture and culture of green mussel on video – for fisherfolk	1	Chaklee/Klong/ Kluay/Nakha/ Bang Mun								103
3.	<i>STUDY TOURS</i>										
3.1	Shrimp nursery in cages – for NGO staff.	5	West Bengal	4							
3.2	Small-scale freshwater prawn hatchery technology – for DOF staff.	7	Thailand	5							
3.3	Offshore small-scale fisheries – for boat builders and fisheries officers.	6	Sri Lanka			1		1			
3.4	Development of small fishing craft – for fisheries officers.	15	India					1			
3.5	Activities of other projects using similar approach to group development – for fisherfolk group members.	14	Indonesia					5			

S. No.	Title	Duration (days)	Venue	No. of Participants						
				BGD	IND	INS	MAL	MDV	SRL	THA
3.6	Functioning enterprises identified as having potential in their communities for training other staff at provincial level – for PFS staff.	21	Jakarta			2				
3.7	Fisheries extension activities – for fisheries extension officers.	24	India/Sri Lanka					2		
3.8	Pole and line fishing – for fishermen and fisheries instructor.	30	Maldives						4	
3.9	Construction and operation of new outrigger canoes – for fishermen.	4	Sri Lanka							6
3.10	Credit schemes for small-scale fishermen/farmers – for bank and Minfish officers.	10	India							9
3.11	Oyster culture and spat collection practices – for DOF staff.	9	Malaysia							6
3.12	Extension systems and fisheries development – for DOF/NFE/COD/Health officers.	10	Indonesia, Malaysia							10
3.13	Project background and achievement, development of extension project and community development by group participation – for project staff and other agencies.	2	Ranong							33
3.14	Fish cage culture – for fisherfolk.	1	Kaper							30
3.15	Fish cage culture – for fisherfolk.	1	Phang Nga							30

Appendix E

POST-HARVEST FISHERIES PROJECT (ODA)

Annual Report 1990

SUMMARY AND WORK PROGRAMME PROPOSAL

1990 has seen two significant changes in the post-harvest project. Firstly, the post of Post-Harvest Fisheries Adviser occupied by D J Walker since 1987 was taken over by T W Bostock from Britain's Overseas Development Administration. Secondly, the thrust of the work has been directed towards taking stock of the many project activities, and resolving and developing those which clearly merit a greater concentration of effort. Correspondingly, a more precise project costing and framework were drawn up during a review mission held in September.

By far the greatest effort has been in India, where 15 separate activities have been operating. These have been reorganised to some extent, to take account of the changes mentioned above, and some have been regrouped under six subproject headings.

Improved utilisation of low-value fish has examined the means of improving the quality of dried anchovies in Tamil Nadu through the introduction of simple drying platform technology at the village-level. Considerable potential has been identified for re-establishing exports of high quality dried anchovy to Sri Lanka, a country which currently imports over 10,000 t/year of this commodity, mainly from Thailand. Other activities under this heading have included a study of the marketing potential of offshore flying fish as well as a continuation of the work related to shark marketing and sharkskin leather production.

Agar extraction at village level was studied in Mandapam (Tamil Nadu) and the completed study showed conclusively that product quality was invariably too poor to enable the operation to become profitable. This work has therefore been discontinued.

Use of ice *at sea* on artisanal fishing craft is a project proceeding well in Andhra Pradesh and Tamil Nadu. The excellent financial support promised by the governments of both states for the next financial year has meant that this activity will soon enter an important expansion phase. Several training and promotion activities have met with good public response, and extension guides are being prepared in local languages.

Shrimp trawler by-catch studies had previously demonstrated that as much as 100,000 t/year of fish were being discarded at sea in the Sandheads region in the upper part of the Bay. Not only does this have known, but little understood, bio-ecological connotations, but it also, from the socio-economic point of view, represents a gross wastage of potential foodfish. This year saw the implementation of a pilot commercial project designed to establish the socio-economic and technical feasibility of increasing fish by-catch landings in Visakhapatnam and processing and marketing these through processor groups of local women.

Fish marketing activities have resulted in the production of four base-line studies which describe marketing channels and marketing in general in the four east coast states. Specific activities implemented include the development of an improved women's fish marketing container currently undergoing field testing in Tamil Nadu and the design and construction of a prototype Permanent Ice Box in Kanyakumari, which is being used to great effect to store fish, helping maintain landed values.

Development of water stable feeds for P. monodon, the major activity, has continued with strong support from the Natural Resources Institute in UK and the Institute of Aquaculture, Stirling. A successful formula, using mainly local ingredients, has been developed and is being farm-tested in Andhra Pradesh alongside more traditional-type formulae. Work completed in West Bengal (Kakdwip) showed that a pelletised presentation was the most effective. The programme is due to be completed in February 1991.

Bangladesh saw the initiation of what, it is hoped, will be a major programme designed to study the extent of losses in dried fish caused by insect infestation. The programme will also examine

current processing practices, including the use of certain insecticides, which have a contributory effect on the losses. This work is being carried out under the auspices of the BOBP Extension programme/Set Bagnet programme.

A Sri Lanka government request for technical cooperation in the project was received by the British High Commission in Colombo and duly forwarded to London. The initiation of the work programme based on the use of ice on artisanal fishing boats, and related extension activities, will take place early in the new year.

It is hoped that 1991, the final year of Phase II of the Post-Harvest Project, will see several major advances in terms of direct application of findings at small-scale level. Special consideration will be given to the use of ice and related onboard/onshore infrastructure which facilitates this. Marketing work will concentrate more on consumer issues, attempting to identify real bottlenecks and make recommendations to State Governments and Corporations on practical improvements.

Emphasis on direct help to women's groups through improved processing and marketing methods designed to reduce economic losses will receive special attention.

Expenditure for FY 1990/91 f 200,000

Wider Objectives To reduce post-harvest losses and improve utilisation of fish in order to enhance incomes of those involved in fish handling and marketing and to improve flow of fish to the consumer.

Targets and progress by country, subproject and/or activity (with activity code in parenthesis) is reported below :

INDIA

Subproject : Improved Utilization of Low-value Fish (ODA/PU/IND)

OBJECTIVES To assess the market potential for expanding the utilisation of certain low-value/low-demand species, such as shark and flying fish, by identifying novel marketing strategies which enhance their value both as fresh fish and processed value-added products.

STATUS 1989 Activities carried out confined to prawn feed development (see ODA/P8A/IND)

Targets 1990

Achievements

Dried Anchovy (ODA/PIB/IND)

Evaluate potential for reducing problems experienced with drying anchovies in the wet season in Kanyakumari in association with the NCO – KDFS and the CIFT

Two reports produced covering anchovy drying (CIFT/BOBP- ODA)

Improve quality and, thereby, utilisation of sun-dried/salted fish in selected locations by demonstrating adaptations of traditional methods.

Low-cost drying racks developed and tested in Kanyakumari district. High quality product produced on pilot scale.

Shark (ODA/P7A/IND)

Complete investigation on species and quantity of shark landed in the east coast states of India.

Study completed on the market for shark in South India and written up.

Determine domestic market potential for skinless shark meat.

Study completed as above.

Determine market potential for sharkskin, as either finished leather or as raw cured, in domestic and international markets

Shark leather production trials ongoing. Good process developed and trial marketing being carried out.

Flying Fish Marketing (ODA /PI A /IND)

Marketing study on flying fish completed.

Assessment

Poor anchovy season this year precluded the possibility of obtaining more concrete data on marketing and initiation of dry anchovy marketing on a larger scale. Results are, however, encouraging, with high quality product value over twice that of traditional product.

Flying fish market testing also hampered by low catches. Results indicate very limited regional market.

Targets 1991

- Establish pilot commercial production of high quality dried anchovy in collaboration with KDFSFS and test market produce in Sri Lanka and home market.
- Disseminate anchovy drying technology through training courses and production of extension guides.
- Shark leather trial production and marketing to continue in order to demonstrate technical and economic feasibility.

Future

- Establishment of improved anchovy drying methodology and supporting marketing infrastructure in the region. Re-establishment of Indian exports to Sri Lanka. Shark leather development will depend largely on interest in market.

Subproject : Seaweed Agar Extraction at Village-level (ODA/P2A/IND)

OBJECTIVES

To introduce village-level agar extraction from local seaweed varieties, thereby increasing incomes of women's groups involved.

STATUS 1989

Field laboratory and technical trials set up and ongoing. Extension work not carried out.

Targets 1990

Complete technical adaptation of agar extraction procedure suitable for fishing village in Tamil Nadu.

Test-market crude agar produced by this method.

Extend technology in two villages.

Achievements

Technical trials unsuccessful. Product of poor quality and with little or no market value. Project abandoned.

Assessment

Socio-economic aspects neglected at beginning of activity. Technical trials too complex for field-based R & D. Technology inappropriate and non-viable.

Subproject : Use of Ice at Sea (ODA/P3A/IND)

OBJECTIVES

To improve the quality and value of fish landed by artisanal fishing boats through the promotion of use of ice on-board and use of insulated fish boxes.

STATUS 1989

Six 200kg capacity boxes in use on *navas*. Economic viability confirmed. Further work initiated in Tamil Nadu.

Targets 1990

Initiate state subsidy to popularise boxes

Facilitate a commercial supply of boxes

Conduct extension campaign to promote substantial uptake by nava operators

Achievements

Agreement from State Fisheries Departments of Tamil Nadu and Andhra Pradesh to subsidise boxes from March 1991. Subsidy level 25-33%, depending on beneficiary status.

Several commercial suppliers identified.

27 training visits carried out in Andhra Pradesh and two in Tamil Nadu. Extension guides in three languages produced. Promoter appointed to maintain contact and facilitate sales. Box sales: ten, so far.

Assessment

High priority placed on this programme. Economic advantages of boxes have become clearer to target group through continuous extension promotion and training. Initial sales are slow due to relatively large capital investment.

Targets 1991

- Introduction of at least 100 boxes with State subsidy in TN/AP.
- Provide support to State Government Directorates of Fisheries for promotion of ice boxes, identification of beneficiaries, and their training.
- Production of economic profiles of ice boxes for small-scale credit facilities from banks.

Future

- Provision of technical support and promotion by project until boxes fully accepted by target communities.

Subproject : Shrimp Trawler By-catch (ODA /P5A /IND)

OBJECTIVES	To establish the socio-economic and technical feasibility of increasing landings of fish by-catch from prawn trawlers.
STATUS 1989	Monitoring of trawlers at Vishakhapatnam indicates potential for increased fish landings.

Targets 1990

Achievements

Finalise report and terminate subproject	Report published indicating extent of gross losses. Pilot commercial operation set up in Vishakhapatnam to procure, process and market frozen by-catch fish from large (>20m) trawlers. Participation of two women's groups. Data gathering from medium and larger trawlers re-initiated to quantify excess capacity on landing.
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Assessment

All by-catch from small trawlers, and most of that from medium-sized short-trip trawlers, is already being landed and used for fish meal, dry fish or fresh fish marketing. The bulk of discards are by large, long-trip trawlers. Marketing trials carried out in major cities so far indicate negative economic returns. Despite good fish size (range 10-30 + cm) and good quality, consumer demand for these species is a limiting factor. High capital cost of large trawlers implies that fish raw material price must be high enough to provide incentive to land.

Targets 1991

- Continue pilot commercial operation in order to gather more socioeconomic and technical data.
- Based on outcome of the above, either terminate or promote the work.
- Study of artisanal by-catch landing systems said to be operating in West Bengal

Future

- Despite much local interest and enthusiasm, the economics of the project appear to be contrary to some expectations. Long-term viability will depend upon the economic returns to small-scale processor groups.

Subproject : Fish Marketing (ODA /P6/IND)

OBJECTIVES	To improve post-harvest fish handling and marketing, and enhance the present levels of income of the small-scale sector in general, through the provision of advice on infrastructural improvements and marketing strategies.
STATUS 1989	Baseline market study in Tamil Nadu completed. Report awaited.
<i>Targets 1990</i>	<i>Achievements</i>
	<i>Baseline studies (ODA/P6C-D/IND)</i>
Undertake baseline survey of Orissa in association with selected NGO	Baseline surveys for Orissa and Tamil Nadu completed and reports published.
Comprehensive assessment of present fish marketing systems along entire east coast of India	Nil, apart from above.
Complete analysis of Kothapatnam data	Nil – work abandoned.
Evaluate role of the railways in fish marketing on the east coast	MFS study completed and report awaited.
	<i>Marketing support to KDFSf (ODA/P6B/IND)</i>
Support and assist NGO – Kanyakumari District Fishermen's Sangams Federation – in undertaking initial pilot marketing activities.	A 2000 kg capacity permanent ice box (P.I.B.) designed by the project and constructed in Kanyakumari is now operating successfully. This is administered by the KDFSf. Extension guide, giving full construction details, produced.
	<i>Improved women's fish marketing container (ODA /P6A /IND)</i>
Continue development of new fish basket for women head-loaders through KDFSf	New design of fish basket for women head-loaders designed and field tested (x100) in Kanyakumari District. Other KDFSf-related activities covered in separate subprojects.

Assessment

Broadly scoped baseline studies cataloguing marketing channels are of limited use in identifying real needs of marketing sector. Problems must be tackled at more localised level by identification

of real constraints. The success of the KDFSFS-based work has highlighted this need and the advantages of implementing small-scale practical solutions. P.I.B. success relates to its now proven ability to maintain landed prices of high value species such as seer fish. The newly-designed aluminium fish container has upto 10,000 potential beneficiaries in Tamil Nadu alone.

Targets 1991

- Undertake consumer-based study in Madras in order to identify constraints in fish marketing. Make recommendations to local municipal authority and DOF to implement any recommendations on improvements highlighted by the study.
- Promote new fish containers in Kanyakumari District and other areas of Tamil Nadu with financial support from State DOF. Target : Sale of 1000 containers to marketing women.
- Construction of further P.I.B. in collaboration with both KDFSFS and State Fisheries Departments.

Future

- Market infrastructure will take many years to develop. Continuous support to local institutions, backed by sound socio-economic and technical research, is absolutely essential for this work. Small infrastructural inputs, such as P.I.Bs, will greatly help at the community level, to bring about improvements both in general fish quality and producer incomes.

Subproject : Development of Prawn Feeds (ODA /P8A /IND)

OBJECTIVES	To involve lower income groups in the expanding prawn culture sector through the development of new, and improvement of existing, low-cost feeds which utilize indigenous raw materials, including low-value fish.
STATUS 1989	Samples of raw materials evaluated for nutritional and physical properties.

Targets 1990

Achievements

Pilot production of test feed by commercial company.	Commercial production carried out at Mysore Snack Foods, Bangalore.
Establish baseline prawn feeding data through trials with Central Institute of Brackishwater Aquaculture in West Bengal	Feeding trials carried out at Kakdwip in coordination with CIBA indicate pelleted feeds better than doughball presentation.
Conduct trials on farm scale with the Department of Fisheries, Andhra Pradesh	Feeding trials at Kakinada ongoing. Harvest due in February.

Assessment

This subproject has provided extremely useful guidelines to the whole brackishwater prawn aquaculture sector. Some of these guidelines have been adopted by the flourishing private sector

feed mills. Further time should have been usefully spent on socio-economic evaluation and on the development of simple, lower-cost feeds for on-the-spot preparation by artisanal producers.

Targets 1991

- Harvest of Kakinada-based farm trials.
- Production of final report on feed formulation and economics, with recommendations on future activities.
- Termination of subproject under Post-Harvest Project.

Future

- A GOI request for a bigger, separately funded, national Technical Cooperation project on prawn feed development is currently being considered by ODA.

BANGLADESH

Subproject : Fisheries Extension Development (ODA/P1A/BGD)

OBJECTIVES

To provide direct advice to extension services and NGOs on potential improvements in post-harvest fisheries. Aimed principally at reduction of losses and income enhancement.

STATUS 1989

Short training carried out in post-harvest technology.

Targets 1990

Achievements

Issue basic handbook in Bengali to supplement and support formal training

Draft produced, but considered inappropriate for financing.

Support post-harvest field extension activities which arise from training

Project identification visit carried out. Cured fish losses due to insect infestation seen as a major problem. Month-long visit carried out by two-member team to further identify problem areas and make recommendations for work programme.

Conduct further training as necessary.

No further training carried out.

Assessment

Insect infestation is a major threat to dried fish in Bangladesh. Losses are both physical and economic in nature. Upto 20% of fisheries production is converted into dried products for domestic consumption at all levels. The sometimes indiscriminate use of non-recommended insecticides could be of public health concern.

Targets 1991

- Initiate dry fish sampling and analysis programme in order to quantify prevailing levels of pesticide residues and determine whether these represent a threat to public health.
- Depending on results of above, to make recommendation on improvements in insecticide use and application.

Subproject : Post-Harvest Aspects of Motorization of Chandi Boats (ODA/P2A/BGD)

OBJECTIVES	Improved marketing and, thus, greater financial returns from operation of motorized <i>chandi</i> boats. Target groups are owners and operators of newly motorized <i>chandi</i> boats in Bhola district. Improved marketing will also benefit consumers. Project proposal submitted to Government of Bangladesh.
STATUS 1989	Nil.

Targets 1990

Achievements

Appraise marketing and advise as necessary	Marketing study completed and report presented.
Advise staff of Department of Fisheries on collection of market data	Not applicable.

Assessment

No action required. Project terminated.

STAFF — POST-HARVEST FISHERIES PROJECT (1990)

Post	Name of incumbent	Date of arrival (Month/Year)
<i>CORE STAFF</i>		
Post-Harvest Fisheries Adviser	Bostock, T W (U.K.)	4/90

Project	Consultant	Period
<i>NA TIONA L CONSUL TA NTS (India)</i>		man-month
1. Prawn feeds and by-catch coordination	Rajendran, A.D.I.	12.00
2. Social development/trainer : ice boxes	Vimala, (Ms) S	10.00
3. Marketing : by-catch	Rao, C.V.	10.00
4. Social development/Field liaison by-catch	Kamila, (Ms) A	08.00
5. Marketing/KDFSF coordination	Vijaynidhi, R	05.50

Project	Consultant	Period
6. CIFT – Fish drying/ice boxes	Kandoran, M.K.	01.50
7. Seaweed – Field Technician	Sivaraman, T	06.00
8. By-catch – Field data collector	Reddy, A.M.	02.00
9. Ice boxes – Field promoter	Salagrama, V	04.00
<i>U.K. CONSULTANTS</i>		
1. Ice box development (IND)	Clucas, I	01.25
2. Prawn feeds (IND)	Wood, J	01 .00
3. Seaweed agar extraction (IND)	Hawkes, A	01 .00
4. Prawn feeds (IND)	Brown, (Ms) J	01 .00
5. Insect infestation (BGD)	Walker, D	01.00
6. Insect infestation (BGD)	Greeley, M	01.00
7. By-catch (IND)	Johnson, (Ms) S	03.25
8. Prawn feeds (IND)	O’Leary, (Ms) C	00.50
9. Prawn feeds (IND)	Bostock, John	00.25
10. Prawn feeds (IND)	Maclean, (Ms) M	01.00
<i>SUPPORTING STAFF (Madras)</i>		
Secretary	Emmanuel, (Ms) P.	
Messenger	Deenadayalan, R	

Appendix F

IMPROVEMENT OF LIVING CONDITIONS OF WOMEN AND THEIR FAMILIES IN FISHING COMMUNITIES (FPA/RAS/904/FPA)

Annual Report — 1990

BACKGROUND

The FAO Population Programme, in collaboration with the FAO Department of Fisheries, sent a mission to Asia in 1988 to give substance to the ideas that emerged during the 1984 World Conference on Fisheries Management and Development. The conference not only emphasized that economic as well as social needs of small fishing communities should be met, but also specifically proposed action to enhance the already important role women had in fishery-related activities.

The mission led to a project proposal, "Improvement of Living Conditions of Women and their Families in Fishing Communities", as an integral part of the Bay of Bengal Programme. It sets out to incorporate into fisheries projects women-oriented development activities, which, in the long run, may influence the population behaviour of the communities. The UNFPA reacted favourably and agreed in mid-1989 to sponsor a 3% year project. It sanctioned funds for a six-month preparatory phase. The total project budget is expected to be about US\$ 1 million.

An inter-agency meeting in Madras, in September 1989, attended by BOBP member countries, FAO's Population Programme, UNFPA and BOBP, agreed with the project's long term objectives and modified the immediate objectives to better address the needs of the region. The meeting emphasized the pilot nature of the activity and the need for evolving, testing and demonstrating innovative approaches. It agreed that, while fishery agencies of the countries would take full responsibility for the execution of the work beyond the end of BOBP's second phase, expected to end in 1992, the work would, in the interim, be integrated as far as possible into existing BOBP subprojects and activities which already involve and address various needs of fisherfolk communities. The meeting discussed preparation approaches and modalities and gave each country the opportunity to discuss and modify country ideas with BOBP staff. Subsequent to the meeting, preparatory activities began, in most countries, in 1989.

OBJECTIVES

The overall aim of the regional project is to contribute to the long-range objective of BOBP, which is to improve the standard of living in coastal fishing communities in terms of economical and social development. The activity will also contribute to a more balanced relationship between population, resources and environment in fishing communities through educating women and reinforcing their participation in economic and social life.

IMMEDIATE OBJECTIVES

It is planned that, by the end of the activity period, there would be, in selected villages in all seven BOBP member countries :

- (a) Enhanced awareness, amongst families in fisherfolk communities, of the integrated nature of population, development and environment;
- (b) Strengthened collective action by women, in fisherfolk communities, for economic and social benefits;
- (c) Improved income earned by women in fisheries and other coastal village-based enterprises; and
- (d) Better access to health, including family planning, nutrition and family welfare services, for fisher families.

NEEDS APPRAISALS

Needs appraisals and country subproject formulation, some of which began late in 1989, were undertaken in the seven BOBP member countries using, in some cases, assigned staff from fishery agencies (Malaysia), national consultants (Bangladesh, India and Thailand), national, non-governmental agencies contracted for the task (Sri Lanka and Indonesia), and BOBP staff working with fishery agency staff (Maldives). Target villages were selected, keeping in mind existing BOBP subprojects, logistics, country preferences and the capacity of the executing agencies. Needs appraisals were undertaken using guidelines prepared by BOBP, and these were appropriately modified in discussion-training workshops. Participatory and rapid appraisal methods were used not only to identify the needs, but also to discuss methods' and modalities of implementation with the women. In all cases, the needs appraisals and the subsequent subproject formulations were undertaken in discussion with, and in close cooperation with, fishery agencies and staff of concerned agencies, both governmental and non-governmental. The needs appraisal and project formulation were given direction and guidance by the Project Advisory Committees convened in each country by the fishery agencies.

The needs identified, while they vary somewhat in content and more often in terms of priority, country to country, generally can be addressed by a few categories of activities : income generation, partly through using the collective strength of women in groups and largely through making available credit; facilitating access to health care, as well as to health, population and nutrition education, in cooperation with the Health Departments and NGOs; and general educational activities to enhance awareness. An ancillary activity planned for is the mobilization of women into groups to address their community needs through self-help schemes.

Almost all these activities fall outside the mandate of fishery agencies, and while fishery agencies see the need for such action, they rarely have the organization, trained manpower and, more importantly, the budget allocations to get involved. The subprojects will use national consultants, hired as Programme Coordinators, to manage the activities and will receive technical assistance inputs from resource persons. However, the sustainability of the activity beyond the project period remains to be ascertained.

The activities themselves pose certain problems. Income generation activities by women at the village level is limited not only by a poor resource base for raw materials, but most often by markets which cannot pick up their services and products. Past experience shows that the enterprises women already practice, and have markets for, are usually the only ones that succeed. Credit is the major obstacle. Given the lack of formal credit sources, most often the only resource is savings mobilization and revolving loan funds, whose sustainability depends on group cohesion, good leadership and skills in managing savings and credit schemes. Managerial skills amongst women also play a crucial role and will have to be introduced and nurtured.

Interagency cooperation to facilitate access to health care and education is possible, with some effort, but difficult to sustain as a mainstream activity without fund inputs and transportation facilities.

Thus, the challenges faced by the subprojects will be not only in terms of making the activities successful and self-reliant, but also in introducing and nurturing in the counterpart agencies the capacity and the interest to support and expand such actions.

Yet the needs are there and the problems women face in fishing communities are often large and difficult. Undoubtedly, more aware, educated, healthy and self-reliant womenfolk, earning higher incomes and improving their social conditions, will go a long way towards increasing the overall development of small-scale fishing communities.

A few particular cases need to be mentioned. The UNFPA-funded subproject in Indonesia is very similar to the existing BOBP activity there. It depends almost entirely on successful group formation and support. This is being reviewed at present and will determine the directions the activities should take, or not take, in the future. In Malaysia, four villages have been identified and beneficiaries

are few; more women should be brought into the activity. And, in the Maldives, 'logistics and the acute shortage of trained manpower will prove to be particularly serious hurdles to implementation.

Targets 1991

The needs appraisals and project formulations have been incorporated into a regional document by the FAO Population Programme and forwarded to UNFPA for clearance and funding. In anticipation of this, plans have been made to initiate activities, starting from January 1991, in all seven countries. The targets for 1991, are listed below, by country :

MALDIVES (EXT/FPA/MDV) : *Nine islands of Meemu, Vaavu and Faafu Atolls.*

Targets 1991

- Appointment of National Programme Coordinator
- Formation of at least one women's group in each of three target islands
- Technical skill training and inputs to three women's groups for vegetable gardening and fruit tree growing
- Technical skill training and inputs to one women's group for poultry upgradation through rooster exchange
- Assistance in control of rat/bat infestation in three islands through women's groups
- Facilitation of health care access and provision of health, nutrition and population education to women in three islands.

SRI LANKA (EXT/FPA/SRL) : *Four villages of Gampaha District and six villages in Puttalam District of the Western and North Western Provinces, respectively.*

Targets 1991

- Appointment of National Programme Coordinator
- Selection and training of 20 female, village-level animators to motivate group formation, savings and credit mobilization, enterprise development and action on women's issues
- Formation of at least one women's group in each of the ten villages
- Savings mobilization and training in savings and credit management
- Initiation of enterprise development through training and facilitation in all ten villages
- Preparation of information/education campaigns on health, population, nutrition and environmental issues, aimed at women's groups, and initiation of activity.

INDIA (EX T/FPA /IND) *Ten villages of St Thomas Mount, Tiruporur, and Tirukazhikundram blocks of Chengai-Anna District of Tamil Nadu State.*

Targets 1991

- Appointment of National Programme Coordinator
- Selection and training in group formation, savings and credit management and enterprise development for ten female, village-level group animators and four group supervisors

- At least one women's group to be formed in each of the ten villages
- Mobilization of savings, and training in savings and credit management
- Enterprise development training, involving selection of enterprise and feasibility analysis, and initiation of some enterprises
- Development of training programmes and materials in health, nutrition and population issues
- Initiation of awareness building amongst women on health, nutrition and population issues.

BANGLADESH (EXT/FPA/BGD) : Ten villages of Lohalia and Mirzaganj unions of Patuakhali District.

Targets 1991

- Appointment of National Programme Coordinator
 - Appointment and training of one group supervisor for each village
 - Formation of at least three women's groups in each of the ten villages
 - Initiation of savings mobilization for group credit
 - Nonformal education in literacy, numeracy and simple book-keeping
- Assistance to improve food availability through training and inputs for vegetable gardening, poultry and backyard aquaculture
- Facilitation of periodic healthcare access associated with health, population and nutrition education.

THAILAND (EXT/FPA/THA) : Ten coastal villages in two districts of Ranong Province.

Targets 1991

- Project staff trained in approaches to women's issues and small scale enterprise management
 - Formation of at least one women's groups in each of the ten villages
- Mobilization of savings in groups
- Training in savings and credit management
- Training in operation and management of small enterprises
- Technical skills training in enterprises selected by them
- Initiation of women's group enterprises
- Preparation of information and education campaigns on health, nutrition and population issues
- Facilitation of access to health services.

MALAYSIA (EXT/FPA/MAL) : Ten villages of Kuala Mudar and Yan districts of Kedah State.

Targets 1991

- Appointment of National Programme Coordinator
- Project staff trained in women's development issues and in small-scale enterprises development

- Identification of remaining six target villages and formation of at least one women's group in each village
- Training in selection of enterprises and feasibility analysis
- Technical skill training in enterprises selected
- Initiation of some women's enterprises
- Preparation and development of materials for information and education campaigns on health, nutrition, population and environmental issues.

INDONESIA (EXT/FPA/INS) : Ten villages of Babalan and Pangkalan Susu sub-districts of Langkat District of North Sumatera Province.

Targets 1991

- Appointment of National Programme Coordinator
- Formation of at least one women's group in each of the ten villages
- Training in savings and credit management
- Mobilization of savings by women's groups
- Training in technical aspects of enterprises selected
- Training in management of small enterprises
- Initiation of enterprises by women
- Preparation and development of training materials for information and education campaigns on health, population, nutrition and environmental issues.

Appendix G

BIO-ECONOMICS OF SMALL-SCALE FISHERIES IN THE BAY OF BENGAL (RAS/89/037)

Status Report

On the recommendations of the 5th Bay of Bengal Committee Session and the 11th Advisory Committee meeting of the BOBP, held in Bangkok, March 1987, a proposal for a regional project on Bio-economics of Small-Scale Fisheries in the Bay of Bengal was prepared by BOBP, in consultation with FAO Headquarters. It was submitted by FAO to the UNDP and BOBC member countries in August 1987. By the end of 1987, the Governments of Indonesia, Malaysia, Sri Lanka and Thailand had formally endorsed it. The 12th Advisory Committee Meeting held in India, January 1988, emphasized the urgent need for responses from the remaining member countries.

By the end of 1988 all member countries except India had endorsed the proposal and UNDP announced at the 13th Advisory Committee Meeting in Malaysia, January 1989, that the project was likely to be approved. However, UNDP had decided to reduce the budget allocation from the requested amount of \$ 1.5 million to \$ 1.0 million. The committee recommended that member countries should ensure that this project received as high a priority rating as possible in their respective countries, within the planning framework for regional UNDP support.

At the end of 1989, India decided not to participate in the project. Consequently, the 14th AC Meeting in Indonesia, January 1990, recommended that UNDP approval of the project for the other six countries should be expedited. It also recommended that, in the meantime, a regional meeting should be held to identify high priority areas for activities in the field of bio-economics and to prepare a work programme.

In the light of India's decision, the project document was revised and resubmitted to UNDP, early in 1990. Since then, India's concurrence to locate the project in the BOBP Headquarters in Madras has been awaited.

In the meantime (1987-1990), the following bio-economics oriented activities were undertaken. Studies of *Kattumaram* Fisheries in India and of Set Bagnet Fisheries in Bangladesh have been funded by the DANIDA/SIDA project GCP/RAS/118/MUL and the meetings/workshops on bio-economics and artificial reefs by the AGFUND project GCP/RAS/126/AGF.

1. *Kattumaram fisheries in Kothapatnam, Andhra Pradesh (India)* (1988-89) — Assessment was attempted of the performance of various fisheries conducted with *kattumarams*, income from the resources exploited, interaction and competition with other fisheries, marketing problems, socio-economic conditions of *kattumaram* fisherfolk and opportunities for other income-generating activities. Recommendations for future development considerations were also examined.

The economic performance of small *kattumarams* was found to be relatively poor and resources exploited by them were primarily juveniles, irrespective of the gear used. Operation of large *kattumarams* was economical and income even and fair year round if at least three types of gear were available. Further improvements through motorization are evident, but quantification requires extended trials. Small *kattumaram* owners and operators are those at or below poverty line and require help through additional income-generating activities.

2. *Set Bagnet Fisheries in Bangladesh* (1988-91) — It was attempted to determine the behaviour of the gear in the estuarine environment and assess the impact on resources exploited by it, interaction with other fisheries exploiting the same resources, income from various sizes of set bagnets and other opportunities for generating income, possible improvements to gear performance, income to communities engaged in the set bagnet fishery and management issues.

The biological survey commenced in November 1989 and was completed in December 1990. Socio-economic surveys commenced in July 1990 and, though the basic survey was completed, systematic

surveys for seasonal changes in the income will be completed only by April/May 1991. Export data on cultured shrimp have been compiled and processed to estimate total number of *P. monodon* exported. Shrimp seed collection data are being gathered and processed to estimate quantity of *P. monodon* seeds stocked for culture. The set bagnet and pushnet study is expected to indicate potential resources of finfish and freshwater prawn seeds for culture as well as the areas and seasons of their availability.

3. *Regional Meeting on 'Bio-economics', Penang, May 1990* — With two participants from each of the six countries participating, the concept and evolution of bio-economic models were discussed, case studies identified for each country and project proposals prepared for the case studies to be undertaken.

4. *Regional Workshop on "Bio-economics", Penang, October 1990* — Two participants from each of the six countries and observers from Malaysia and AFSSRN discussed methodologies for bio-economic assessment, parameters to be used and data requirements. They also learned about an existing FAO computer package, conducted simulation exercises, and prepared detailed workplans for the case studies identified earlier. The workshop was sponsored jointly by FAO Headquarters and BOBP.

5. *National Workshop on Artificial Reefs on the West Coast of Thailand, Phuket, November 1990* — About 30 participants and observers from the east and west coasts of Thailand (and one from Malaysia) observed locations in Ranong Province where ARs were deployed and discussed past experiences, survey methods adopted and their limitations, and made recommendations for future surveys of artificial reefs and bio-economic assessment of their impact on environment, resources and fisherfolk.

Experience from these activities have confirmed that better understanding of fisheries can be achieved through a bio-economic approach, that it enhances the considerations for fishery management and helps in the choice of management options. It contributes to clearer identification of the various types of fisheries undertaken by one or more types of fishing craft as well as of the specific components of the fisherfolk communities that require attention for purposes of managing the resource and improving the income level. It is also felt that fisherfolk need better understanding of their fisheries and that their participation is essential for the developmental process and implementation of management measures. The significance of linking the socio-economic component to bio-economic assessment was realised and with additional input of staff in this field and appropriate allocation of counterpart staff for the various subprojects (case studies), the objectives of the project may be achieved more quickly than originally anticipated.

Details of the subprojects and targets for 1991 follow. The case study identified for Bangladesh was the bio-economic assessment of the set bagnet fishery in the estuarine sector and this is already an ongoing subproject under the "Small-Scale Fisherfolk Communities" project. It is detailed in the Annual Report of that project (GCP/RAS/1 18/MUL). (See pages 50-52)

***Subproject : Bio-economic and Socio-economic Impact of
Fish Aggregating Devices in the Maldives (RES/FAD/MDV)***

OBJECTIVES	To assess the impact the use of FADS has on productivity of small-scale fishery for tuna, its economics and on the living conditions of the fisherfolk.
TARGET GROUP	Small-scale tuna fishermen in selected atolls.
STATUS 1990	Pole-and-line with live bait is the primary fishing method in the Maldives. The country has a small population of about 215,000 people. The increase

in tuna production in recent years has been achieved more by motorization of traditional fishing craft than through increase in the total number of craft. To enable further increase in production, productivity and income to fisherfolk, the Ministry of Fisheries and Agriculture has been conducting trials with FADs to aggregate tuna. Considerable knowledge and understanding of the fabrication and deployment of FADs have been gained. But the assessment of its impact has been rather qualitative. A quantitative bio-economic assessment to determine the impact FADs have on the resources, fisheries and the socio-economic conditions of the fisherfolk, as well as to facilitate the use of such devices, is, therefore, needed.

Targets 1991

- Assigning of project personnel
- Reviewing past experiences in the Maldives
- Identification of suitable types of FADs, deployment sites and islands to be surveyed for socio-economic aspects
- Procurement of materials and equipment
- Identification of fishermen to participate in the activities
- Training of project staff and education of selected fishermen
- Pre-deployment surveys and assessments (bio-economic and socio-economic aspects)
- Fabrication and deployment of FADs

Future

- Post-deployment surveys of fisheries and fisherfolk engaged in fishing at, and away from, the FADs
- Analysis and reporting
- Workshop to discuss results, management issues and information to be disseminated
- Dissemination of information to fisherfolk, and fisherfolk participation in utilization, maintenance and protection of FADs

Subproject : Bio-economics of Small Pelagic Fisheries in Sri Lanka
(RES/SPL/SRL)

OBJECTIVES

Bio-economic assessment of the exploitation of small pelagics by various fisheries, income distribution, likely socioeconomic effects of different management regimes. In-service training/education of project staff and fisherfolk in the various aspects involved.

TARGET GROUP

Small-scale fisherfolk engaged in the use of different methods of fishing for small pelagics along the southwest coast of Sri Lanka.

STATUS 1990

Many types of traditional and non-traditional fishing methods, such as castnets, beach-seines, pole-and-line, synthetic gillnets, trolling lines etc, have been largely used in exploiting small- and medium-sized pelagic species. In the recent past, more efficient methods, such as purse seining, have been introduced using 3.5 GRT boats. As a result, there have been reports of economic losses to subsistence level fishermen who cannot compete with the more efficient modern methods. At the same time, fishing intensity in the coastal areas has increased and the resources supporting these fisheries are under threat of overexploitation. Hence, it is felt necessary to conduct biological, economic and socio-economic studies in order to ascertain the impact of the various fishing methods on the resources of small pelagics and on the socio-economic conditions of the fisherfolk engaged in these small-scale fisheries.

Targets 1991

- Assignment of project staff and briefing
- Review of available information
- Frame survey and identification of sampling sites
- Preparation of forms and questionnaires
- Training officers from NARA and Minfish
- Commencement of data collection – bio-economics and socio-economics
- Briefing fisherfolk on aspects investigated and organisation of their participation in assisting surveys and data collection.

Future

- Continuation of data collection to complete one-year cycle
- Analysis and reporting
- Workshop to discuss results and management issues; information to be disseminated
- Dissemination of information to fisherfolk.

Subproject : Bio-economics of a Shrimp Fishery in Malaysia
(RES/SHR/MAL)

OBJECTIVES

Assessment of the bio-economics of the fisheries exploiting the shrimp resources in the Larut District and to improve the capabilities of the national staff through on-the-job training on the methodologies introduced.

TARGET GROUP

Fishermen operating various types of shrimp fishing gear in Larut District of Perak State, Peninsular Malaysia.

STATUS 1990

Around 75% of the total marine landings in Malaysia are derived from waters within 30 miles from shore and the present level of capitalisation in the fisheries of inshore areas is considered to be in excess of available resources. Shrimps constitute one of the important and valuable components of the resources. The shrimp landings on the west coast of P. Malaysia have declined since the peak of 60,000 t in 1978 and now fluctuate around 50,000 t. Trawls, Danish seines, trammelnets, bagnets and pushnets are exploiting many shrimp species in various stages of life. The Department of Fisheries is desirous of determining the optimum level of exploitation, both from the biological and economic points of view and the relative performance of the various fishing methods, to serve as guidelines for future policies and management of shrimp resources.

Targets 1991

- Reviewing available data/information on the shrimp fisheries and ongoing research programme
- Procurement of equipment
- Training programme for samplers and junior biologists
- Shrimp larval sampling for recruitment studies
- Identification of additional data/information to be collected on the fisheries and biology of the selected species
- Preparation of forms/questionnaires
- Commencement of sampling programme

Future

- Continuation of data collection to complete a one-year cycle
- Analysis and reporting
- Workshop
- Dissemination of information.

Subproject : Bio-economics of Small-scale Fisheries in an Artificial Reef Area in Thailand (RES/ART/THA)

OBJECTIVES

1. Bio-economic and socio-economic assessment of the effects of artificial reefs.
2. Identification and demonstration of fishing methods suitable for small-scale fisheries near artificial reefs.
3. Strengthening the capabilities of national staff in conducting such assessments.

TARGET GROUP

Fisherfolk along the coastal belt in Muang and Kapur Districts of Ranong Province.

STATUS 1990

Due to overexploitation of marine fishery resources in Thailand, mainly by trawlers, the Department of Fisheries launched a programme in 1988 to deploy artificial reefs in two provinces in each year. It is one of the programmes that has been accorded high priority and involves expenditure of millions of Bahts out of national funds.

The aim of the programme is the development of productive eco-systems, enhancement of the marine resources – including simple aggregation of fish as well as increase in biomass of fish – reduction in the operation of trawlers and pushnets in the shallow areas, and creation of opportunities for small-scale fisherfolk to improve their catches and income. Achievement of these benefits is dependent on an appropriate artificial reef management system.

To fulfil these needs, it is considered that a bio-economic assessment of the impact of the artificial reef on the environment, resources and the fisherfolk dependent on them is necessary.

Targets 1991

- Ordering equipment
- Training programmes for subproject staff and preparation of forms and questionnaires
- Compilation of catch statistics/data on commercial fisheries and demersal surveys conducted prior to deployment of artificial reef
Assessment of income from fisheries prior to deployment to be estimated using the catch rates from above and prices of fish at the time
- Processing of post-deployment trawl survey, underwater visual observations and commercial fisheries. data collected since 1989
- Carry out underwater survey (visual, photographic and other recording equipment) (a) to estimate density distribution of fish species on the reef and at varying distances from the reef and (b) to investigate colonization of the artificial reef and the biomass of sedentary/ sessile organisms on the reef
- Discussions between project team and fisherfolk on utilization and protection of artificial reefs and management of fishery resources around them
- Commencement of new data collection on bio-economics of the fisheries and socio-economics of the fisherfolk.

Future

- Continuation of bio-economic and socio-economic data collection upto the end of an one-year cycle
- Communicating information, on relevant aspects, to fisherfolk
- Analysis of data

- Assessment of impact of existing methods of fishing and identifying needs for new methods or improvements to existing methods
- Fishing trials as required
- Reporting
- Workshops for discussion and dissemination of results.

Subproject : Bio-economic Assessment of Shrimp Fisheries in Indonesia
(RES/SHR/INS)

OBJECTIVES

1. Assessment of bio-economics and socio-economics of the fisheries exploiting shrimps (penaeid) in a specific area, consideration of a preliminary management plan for shrimp fisheries, and identification of fishing method(s) that may provide optimum economic and social benefits from shrimp resources.
2. In the process, the fisheries officers and fisherfolk are expected to gain better understanding of the various aspects.

TARGET GROUP

Shrimp fisherfolk on the east coast of N. Sumatera Province.

STATUS 1990

With the banning of bottom trawling since 1980, the small-scale trap; gillnet, trammelnet and Danish seine fisheries for shrimps have increased. And it is feared that the increasing fishing effort could affect the shrimp resources and also have an impact on the socio-economic conditions of the fisherfolk engaged in these fisheries.

The east coast of North Sumatera is an area with a high complexity of small-scale shrimp fisheries. The Fisheries Directorate of Indonesia, therefore, has proposed that this be the target area for a pilot study.

Targets 1991

- Training of project staff
- Conduct of frame surveys for fisheries and socio-economics and preparation of forms and questionnaires for the main survey
- Procurement of equipment
- Examination of available information on the fisheries and data from any previous surveys
- Commencement of bio-economic, socio-economic and post-harvest technological investigations and data collection

Workshop to discuss progress, assessment and methodologies to be applied.

Future

- Continuation of investigations and data collection until one-year cycle is completed
- Communicating with fisherfolk on the status of the fisheries, resources of shrimps and the impact of the various fishing methods in use
- Analysis
- Reporting
- Workshops for discussing the results, determination of management issues and information to be disseminated to fisherfolk.

Appendix H

NATIONAL PROJECTS IMPLEMENTED THROUGH BOBP

Annual Report - 1990

Four national projects, with funding arrangements separate from the regional projects, were implemented through BOBP in 1990. They were :

1. *Reef Fish Research and Resources Survey in the Maldives – Phase II (MD V/88/007)* – This UNDP-funded project attempts to assess the reef fishery resources and assist in increased production and utilization of the resources. The survey work has been hampered by problems with the research vessel and project staff. The work will, however, result in a much improved assessment of the reef resources. A marketing study completed late 1989 indicated that the prospects for increased utilization of the reef fish are poor – at least, in the short-term perspective.

2. *Extension Training for Fisherfolk, Sri Lanka (SRL/87/003)* – This project, funded by UNDP, had already been started in 1988 as a separate national project. It was only in July 1990, on the departure of the project's Chief Technical Adviser, that it was brought under the umbrella of BOBP. The purpose of the project is essentially to strengthen the extension service by providing training, equipment and materials. It is scheduled to be terminated by mid '91.

3. *Fishing Craft Development, Kerala, India (FAO/TCP/IND/8852(A))*- This project was terminated in October 1990 after a duration of 24 months. Its conclusions are, in brief :

- (a) A modified design of the 8.5m plywood canoe driven by an outboard engine is better than the existing ones.
- (b) The beachlanding craft (IND-20) may not be an economically suitable craft for this particular type of fishing, because other craft, requiring lower investment, catch the same amount of fish.
- (c) A new type of propulsion system (using rubber bellows), allowing the use of small diesel engines for small craft, looks promising.

4. *Motorization of Chandi Boats (MCB/BGD)* – This project was planned as follow-up of the BOBP's successful attempts at motorizing the *chandi* boats in Bhola District in 1980-82. The commencement of the project got delayed because external donor funding could not be found. However, in 1988, BOBP started the first phase of the project with the motorization of twenty *chandi boats*. Later, in 1990, DANIDA agreed to co-fund this project and motorize fifty more *chandi* boats. The implementation of the second phase got underway during the year.

Further details of the projects follow.

Project : Reef Fish Research and Resources Survey in the Maldives – Phase II (MDV/88/007)

DURATION	30 months, 1989 - 1991
INPUT	US \$ 366,000 from UNDP
OBJECTIVES	Enabling the MOFA to assess the reef fish resources and the status of existing fisheries. Assistance for improved reef fish product development and for assessment of the development potential in the reef fisheries (a pre-investment study).
STATUS 1989	The first phase of this project was implemented during 1987-1988. The outcome was an assessment

of the reef fish resources of Male Atoll. Progress in survey work in three more atolls was retarded during 1989, due to unforeseen delay in obtaining a new engine for the survey vessel *Farumas*. After further repairs to vessel and engine, and recruitment of the full complement of crew, active survey commenced in November. A fishing technologist completed a three months fellowship in Australia. A marketing study showed that short-term prospects for increased export of reef fish are poor.

Targets 1990

Completion of two exploratory fishing coverages of three selected atolls

Assessment of availability and cost of bait

Completion of overseas training of biologists

Sampling of commercial fishery

Continuous processing of data

Preparation of proposal for follow-up activities

Achievements

Only one coverage achieved, partly because of the absence of a FAO biologist for about six months between the assignments of two incumbents. The project has therefore been extended by six months, till mid-'91.

New species and differences in catch rates were observed in the unexploited atolls being surveyed.

Information being collected in connection with the survey work.

Only one biologist trained in reef fish biology at the Institute of Marine Sciences, Australia. The last fellowship is postponed to 1991.

Not achieved as planned, because of the difficulties in recruiting field officers. Some observations were made by the biologists and technicians of MRS during the survey cruises. Commercial catch data from some atolls are also being provided by the ODA-supported coral reef project.

Undertaken.

Postponed to 1991, consequent to the extension of the project until June 1991.

Assessment

The survey work and the commercial catch sampling have been much more sporadic than originally planned. This will naturally affect the results. It is believed, however, that a fair assessment of resources can be made at the end of the project. For the time being, this would probably suffice, since there aren't any immediate possibilities of making better use of the reef resources.

Targets 1991

Exploratory fishing to complete second coverage

- Commercial type fishing, particularly, in deep waters
- Monitoring bait availability and costs
- Fellowship for Fishing Technologist
- Observation of commercial fisheries by biologists and technicians of MRS
- Processing of data
- Analysis and reporting
- Consultancy for investigating the giant clam fishery in the Maldives and potential for culture.

Project : Extension Training for Fisherfolk, Sri Lanka (SRL/87/003)

DURATION	3 years, August 1988-June 1991
INPUT	US \$ 698,481 from UNDP (Revised July 1990)
OBJECTIVES	<p>(Revised July 1990)</p> <ol style="list-style-type: none">1. The establishment and execution of an ongoing programme for the training and upgrading of fisheries extension service personnel.2. The establishment of a fishery extension service under the Training and Education Division of the Ministry of Fisheries and Aquatic Resources with a Central Extension Unit (CEU), responsible for extension service management, planning and training, and Regional Extension Units (REU), to assist field agents with programme implementation. The first REUs will be located at the Regional Fisheries Training Centres at Negombo and Tangalle and at one of the Inland Fisheries Breeding and Experimentation Stations. Two mobile extension units will be provided to the Regional Fisheries Training Centres at Jaffna and Batticaloa. The extension service will develop the capacity to provide extension support to marine and freshwater fisheries, and will, by the end of the project, acquire the necessary knowledge of extension methodology, extension programme design, including monitoring and evaluation, production of extension aids, organization of field extension activities and the use of mobile units for extension purposes to ensure the dissemination of appropriate fishing and fish farming technology.
STATUS JUNE 1990	<p>The project started in August 1988 as a national project of the FAO funded by the UNDP. In mid-1990, the CTA moved to a position at FAO headquarters and it was agreed that the project be executed by MFAR under the BOBP umbrella.</p> <p>The activities of the project until June 1990 focused on establishing the organizational framework and on manpower development through training. The field activities were limited by the disturbed conditions prevailing in Sri Lanka.</p> <p>The CEU, with four staff, and two marine REUs, with four staff each, were established at Negombo and Tangalle. Thirteen senior staff were trained by the CTA as trainers during a six-week course in extension methodology and practices.</p> <p>Courses were developed (including the associated material) in extension methodology and practices; in fishing gear; and engine repair and maintenance. Courses were also offered to fishery inspectors in extension methodology (79 officers) and fishing gear (14 officers).</p>

Three mobile units were acquired, equipped and located at Tangalle, Negombo and at SLFTI, Colombo (awaiting location of the inland fisheries REU).

Six officers sent abroad for training in extension methodology, development communication and in technical fisheries subjects have returned. One officer is at present undergoing post-graduate training in fisheries extension methodology.

The expected completion date of the project, originally set for January 1989, was revised to March 1990 and, finally, to June 1991, because of delays caused by the disturbed conditions in the country.

Targets 1990 (July-December)

Design and development of curriculum and materials :

1. Course on extension methodology and practices, in Tamil.
2. Practical course in fish handling and processing

Training courses :

1. Training of field officers in extension methodology and practices
2. Fishing Gear
3. Fish Handling and Processing
4. Training in media development and graphics
5. Advanced training

Publications for dissemination of fisheries extension

Achievements

Completed. The effort was a translation of the English and Sinhala material.

NARA officers completed the preparation of a course to orient and familiarize FIs with fish handling. The course did not cover fish processing, which will be undertaken in 1991.

Thirty-six officers in three batches of 12 were trained by CEU trainers (14-day course).

Fourteen officers were trained at SLFTI by a trainer from the Regional Training Centre (36-day course).

A two-person team from NARA undertook a course to orient twenty officers in fish handling at SLFTI (1 -week course).

Twelve officers drawn from DOF and MFAR were trained during a three-week course offered by DTCP, Manila, in Colombo. During the course, three manuals were developed and finalized by the trainees.

A senior officer of MFAR was sent to the University of Reading for the M.Sc. course in Extension and is expected back in 1991.

Two publications for fisherfolk, one on the international rules of collision avoidance by vessels at sea and the other on navigation rules for small fishing craft, were finalized and sent for printing. Six other documents were in the process of development and will be completed and printed in 1991.

The procedures for development and clearance of publications within MFAR were established and agreed to.

Equipment for REUs

Four OBM were made available to the REUs for training and demonstration purposes.

Field extension

The Negombo REU provided a three-week course on fish processing for twenty women in Wennappuwa and a 14-day course on net mending and navigation for 45 fishermen in Aluthgama.

The Tangalle REU provided a 21-day course in OBM maintenance, fishing gear and FRP boat repair to forty men and 12 women in Rathgama and a 14-day training for fishermen on navigation, under the auspices of the NORAD IRDP programme in Hambantota.

Assessment

The project has contributed towards manpower development of MFAR through training of field level officers in extension methodology and in technical fisheries aspects, especially since the field officers had not received any induction training from the department. However, the training inputs have been short and, while they may prove useful in terms of awareness building and some skill development, they may not build in the skill levels necessary to address the technical needs of fisherfolk. This issue needs to be addressed in the future. The publications effort, though lagging behind target, is an important way of making available important information to officers and fisherfolk. The capability to develop such documentation has been developed in MFAR by the project.

The degree to which the project's objective can be achieved will be affected by the reorganization of MFAR which is in progress. The impact of the reorganization needs to be considered to better utilize the training and learning of the project. The policy decision of MFAR to step out of all aquaculture activities will, in effect, eliminate large sections of the immediate objectives and release some project funds which could be put to use elsewhere at the end of the present timeframe.

The fisheries development plan (1990-1994) of the MFAR, with its emphasis on more efficient fisheries and on conservation and resource management, would be impossible to implement without a strong, capable and committed extension service. The project and its follow-up could play a crucial role in giving direction to this need.

Targets 1991 (January-June)

- Training for field officers in :
 - Extension methodology and practice (48 officers)
 - Fishing gear (28 officers)
 - Engine maintenance (28 officers)
 - Fish handling and processing (20 officers)
- Curriculum and materials development for :
 - Fish handling and processing.
- Publications development and production :
 - Fisheries extension for FIs
 - Handbook on OBM maintenance for FFs

- Fishing gear manual for Fls
- Trouble shooting OBM's for Fls
- Fish processing for Fls
- Provision of equipment for CEU/REUs, based on need.
- Review of project and development of proposals for follow-up.

Project : Fishing Craft Development, Kerala (FAO/TCP/IND/8852(A))

DURATION	24 months : October 1988-October 1990
INPUT	US\$ 139,000 from FAO
OBJECTIVES	Introduction of new types of cost-effective motorized fishing craft in Kerala and training of local fishermen in their use.
STATUS 1989	<p>Four 8.5m outboard motorized plywood canoes (IND- 26), one 9.5m inboard motorized plywood canoe (IND-27) and one 9m inboard motorized plywood canoe (IND-28) have been designed and built. Local private boat builders were trained in this new method of plywood canoe construction. One beachlanding craft (IND-20) was modified for installation of a water-cooled VST engine propulsion system and an insulated, built-in ice box. For hauling craft on beach, manual and engine-driven hauling devices were provided.</p> <p>Fishing trials in cooperation with small-scale canoe fishermen of Poonthura fishing village, Trivandrum district was commenced. The initial experiences of the trials were :</p> <ul style="list-style-type: none"> – The IND-26 canoe performed well and the cooperating fishermen were satisfied with the design, strength and stability. For increased speed and safety of craft at anchor there was a need to design and test plywood canoes of similar size with sharper bow and deck. – The IND-27 was plagued with technical problems in the reverse reduction gearbox. The fishing results were also very poor. Continuing technical problems with the reverse gearbox led to the development of a new propulsion system featuring rubber bellows and a step-down chain sprocket instead of the reduction gearbox. This new propulsion concept was introduced in the new 9.0m inboard motorized plywood canoe (IND-28). The construction of the canoe was nearing completion. – The air-cooled BLC did not perform well. The speed was too low for fishing in

offshore areas. Its operation was therefore stopped at the end of the year.

- The water-cooled BLC performed well technically, but the fishing results in most offshore areas were very poor due to poor availability of large pelagic and demersal resources. The cooperating fishermen also felt that the speed was too low for offshore fishing.

Targets 1990

Completion of a one-year cycle of fishing trials and demonstration of BLC (IND-20) and plywood canoes

Construction, testing and demonstration of three canoes, IND-26A, IND-29 and IND-28

Training of fishermen in use and maintenance of diesel engine propulsion system of BLC

Fishing trials and demonstration of BLC and IND-27 canoes in the offshore zone

Demonstration of boat hauling devices for BLCs and plywood canoes

Training and demonstration in use of sail for fishermen/users of BLC and new canoes

Preparation of leaflets and video film.

Evaluation and reporting and recommendations for follow up

Achievements

Seventeen months were completed for IND-20 and the first 8.5m plywood canoe IND-26. The performance of IND-20 was poor in offshore areas but, because of better availability of small pelagic species, much improved in coastal areas.

The 8.5m plywood canoe IND-26 performed well technically as well as economically.

Done. The 8.5m plywood canoe IND-26A did not perform technically as well as IND-26. Sharper bow resulted in insignificant gain of speed but significant loss of stability.

The 8.0m decked plywood canoe IND-29 did not have sufficient stability and had to be converted into an open canoe.

The inboard motorized 9.0 m plywood canoe IND-28 performed well in coastal areas. Low fuel cost was much appreciated by the cooperating fishermen.

Done, in the form of in-service training by the Project engineer and mechanic.

Done. The performance of BLC IND-20 in offshore zones was poor. Low speed combined with poor catches renders its operation uneconomical.

The 9.5m plywood IND-27 did not perform well, because of continuous problems with the reverse reduction gearbox. The trials had to be discontinued.

Not done. Traditionally, fishing craft in Poonthura are not hauled up on the beach after each fishing trip. Fishermen felt that the plywood canoes can be handled by manpower. Also, because of congestion on Poonthura beach, hauling device could not be permanently installed there.

Done. Each BLC and plywood canoe built by the project was provided with an emergency sail rig. Fishermen were therefore trained in their use.

Not done.

Done. It will be published as BOBP/REP/49.

Assessment

The beachlanding craft IND-20 was found not suitable for operation in most offshore areas. The catch rates were too low for economic viability. The main reason was the non-availability of large pelagic species. Despite good catches in coastal areas, the IND-20 is too expensive a craft compared with new plywood canoes for fishing in the coastal area unless operated from surf beaten beaches from where an open canoe cannot operate.

The new 8.0m plywood canoe IND-26, designed, built and demonstrated by the Project, offers advantages in strength and sea kindliness compared with the existing design of plywood canoes. Based on the experience in operating this craft and its limited introduction, wider introduction of the final version of plywood canoe IND-26C is recommended in order to make the fishermen aware of the superior performance and stronger construction of this craft .

An economic evaluation of the outboard powered IND-26 and the 8.6m diesel inboard powered plywood canoe IND-28 showed that the IND-28 had a significantly higher return on investment and crew earning than the IND-26. The economic advantage of the diesel-powered canoe strongly suggests that trials of the diesel-powered craft be continued to establish their technical reliability before they are introduced on a larger scale.

As new plywood canoes are similar in size to the existing traditional craft and other types of plywood canoes that have been introduced, the fishermen easily accepted the new, improved designs. There is, therefore, no specific need to train them in their use, other than in the use and maintenance of the inboard diesel propulsion system.

The new plywood canoes (8) were built by two private boatyards which also engage in construction of other types of canoes. The design and method of construction have been adopted and the carpenters of the two boatyards are quite capable of constructing these types of plywood canoes.

Project : Motorization of Chandi Boats in Bhola District, Bangladesh

DURATION	4 1/2 years (January 1987 - June 1992)
INPUTS	DANIDA US \$ 177,555
OBJECTIVES	Improvement of the income of the small-scale fishermen of the Bhola District through increased productivity, by providing increased access to remote and relatively under-exploited fishing grounds, enabling increased fishing time by reaching fishing grounds quickly.
STATUS 1989	<p>This project is a follow-up of a successful pilot project under which chandi boats were motorized using long-tail propulsion units. The trials showed that motorization doubled both landings and the incomes of the fishermen. As a result of this success, BOBP proposed a follow-up project to motorize more <i>chandi</i> boats and donor agencies were approached. DANIDA expressed interest in funding fifty engines.</p> <p>As there was a delay in obtaining co-funding support, BOBP started by motorizing ten boats in January 1988. A further ten boats were motorized in June 1988.</p>

Targets 1990

Preparatory work

Identification of beneficiaries

Procurement of engines

Installation of engines

Training

Achievements

A field supervisor and two mechanics were recruited and site office accommodation was obtained in Daulatkhan and Charfession *upazillas*.

Fifty beneficiaries were selected from the *upazillas* of Daulatkhan and Charfession.

All engines and accessories were procured and transported to sites.

Only 17 engines were installed as the other fishermen were not interested if they did not also receive fishing gear. It was not possible to procure the gear due to procedural delays in the release of funds.

100 *chandi* boat operators were trained by the engine supplier and the BOBP field supervisors.

Targets 1991

- Procurement of gear
- Issue of remaining engines and providing associated training
- Monitoring boat performance and repayment of loans.

Assessment

The delay in the flow of funds impeded the progress of the project to a great extent. The catches of the motorized boats and, consequently, the incomes of the operators are very satisfactory. The repayment of loans on the first twenty motorized boats has been completed in full except for one case of a lost engine.

Future

Utilization of the repayments in the form of a revolving fund.

PUBLICATIONS OF THE BAY OF BENGAL PROGRAMME (BOBP)

The BOBP brings out the following types of publications :

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

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

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

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

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

Other publications which include books and other miscellaneous reports.

A list of publications in print follows. A complete list of publications is available on request.

Reports (BOBP/REP/...)

21. *Income-Earning Activities for Women from Fishing Communities in Sri Lanka*. E. Drewes. (Madras, September 1985.)
22. *Report of the Ninth Meeting of the Advisory Committee*. Bangkok, Thailand, February 25-26, 1985. (Madras, May 1985.)
23. *Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka*. (Madras, March 1986.)
24. *Fishermen's Activities in Bangladesh : A Participatory Approach to Development*. P. Natpracha. (Madras, May 1986.)
25. *Attempts to Stimulate Development Activities in Fishing Communities in Adirampattinam, India*. P. Natpracha, V. L. C. Pietersz. (Madras, May 1986.)
26. *Report of the Tenth Meeting of the Advisory Committee*. Male, Maldives. 17-18 February 1986. (Madras, April 1986.)
27. *Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India*. E. Drewes. (Madras, May 1986.)
28. *Small-scale Aquaculture Development Project in South Thailand : Results and Impact*. E. Drewes. (Madras, May 1986.)
29. *Towards Shared Learning : An Approach to Non-formal Adult Education for Marine Fisherfolk of Tamil Nadu, India*. L. S. Saraswathi and P. Natpracha. (Madras, July 1986.)
30. *Summary Report of Fishing Trials with Large-mesh Driftnets in Bangladesh*. (Madras, May 1986.)
31. *In-service Training Programme for Marine Fisheries Extension Officers in Orissa, India*. U. Tietze. (Madras, August 1986.)
32. *Bank Credit for Artisanal Marine Fisherfolk of Orissa, India*. U. Tietze. (Madras, May 1987.)
33. *Non-formal Primary Education for Children of Marine Fisherfolk in Orissa, India*. U. Tietze, Namita Ray. (Madras, December 1987.)
34. *The Coastal Set Bagnet Fishery of Bangladesh – Fishing Trials and Investigations*. S. E. Akerman. (Madras, November 1986.)
35. *Brackishwater Shrimp Culture Demonstration in Bangladesh*. M. Karim. (Madras, December 1986.)
36. *Hilsa Investigations in Bangladesh*. (Colombo, June 1987.)
37. *High-Opening Bottom Trawling in Tamil Nadu, Gujarat and Orissa, India : A Summary of Effort and Impact*. (Madras, February 1987.)
38. *Report of the Eleventh Meeting of the Advisory Committee*. Bangkok, Thailand, March 26-28, 1987. (Madras, June 1987.)
39. *Investigations on the Mackerel and Scad Resources of the Malacca Straits*. (Colombo, December 1987.)
40. *Tuna in the Andaman Sea*. (Colombo, December 1987.)
41. *Studies of the Tuna Resource in the EEZs of Sri Lanka and Maldives*. (Colombo, May 1988.)
42. *Report of the Twelfth Meeting of the Advisory Committee*. Bhubaneswar, India, 12-15 January 1988. (Madras, April 1988.)
43. *Report of the Thirteenth Meeting of the Advisory Committee*. Penang, Malaysia, 26-28 January, 1989. (Madras, March 1989.)
44. *Report of the Fourteenth Meeting of the Advisory Committee*. Medan, Indonesia, 22-25 January, 1990. (Madras, April 1990.)
45. *Report of the Seminar on Gracilaria Production and Utilization in the Bay of Bengal Region*. (Madras, November 1990.)
46. *Exploratory Fishing for Large Pelagic Species in the Maldives*. R.C.Anderson and A. Waheed. (Madras, December 1990.)

47. *Exploratory Fishing for Large Pelagic Species in Sri Lanka*. R. Maldeniya & S.L. Suraweera. (Madras, April 1991.)
48. *Report of the Fifteenth Meeting of the Advisory Committee*. Colombo, Sri Lanka, 28-30 January, 1991. (Madras, April 1991.)

Working Papers (BOBP/WP/ ..)

28. *Traditional Marine Fishing Craft and Gear of Orissa*. P. Mohapatra. (Madras, April 1986.)
29. *Reducing the Fuel Costs of Small Fishing Boats*. O. Gulbrandsen. (Madras, July 1986.)
30. *Mackerels in the Malacca Straits*. (Colombo, February 1985.)
31. *Tuna Fishery in the EEZs of India, Maldives and Sri Lanka*. (Colombo, February 1985.)
32. *Pen Culture of Shrimp in the Backwaters of Kiffai, Tamil Nadu : A Study of Techno-economic and Social Feasibility*. R. N. Roy. (Madras, January 1985.)
33. *Factors that Influence the Role and Status of Fisherwomen*. K. Anbarasan. (Madras, April 1985.)
34. *Pilot Survey of Set Bagnet Fisheries of Bangladesh*. A. Kashem. (Madras, August 1985.)
35. *Pen Culture of Shrimp in the Backwaters of Kiffai, Tamil Nadu*. M. Karim and S. Victor Chandra Bose. (Madras, May 1985.)
36. *Marine Fishery Resources of the Bay of Bengal*. K. Sivasubramaniam. (Colombo, October 1985.)
37. *A Review of the Biology and Fisheries of Hilsa ilisha in the Upper Bay of Bengal*. B. T. A. Raja. (Colombo, October 1985.)
38. *Credit for Fisherfolk : The Experience in Adirampattinam, Tamil Nadu, India*. R. S. Anbarasan and O. Fernandez. (Madras, March 1986.)
39. *The Organization of Fish Marketing in Madras Fishing Harbour*. M. H. Kalavathy. Madras, September 1985.
40. *Promotion of Bottom Set Longlining in Sri Lanka*. K. T. Weerasooriya, S. S. C. Pieris, M. Fonseka. (Madras, August 1985.)
41. *The Demersal Fisheries of Sri Lanka*. K. Sivasubramaniam and R. Maldeniya. (Madras, December 1985.)
42. *Fish Trap Trials in Sri Lanka*. (Based on a report by T. Hammerman). (Madras, January 1986.)
43. *Demonstration of Simple Hatchery Technology for Prawns in Sri Lanka*. (Madras, June 1986.)
44. *Pivoting Engine Installation for Beachfanding Boats*. A. Overa, R. Ravikumar. (Madras, June 1986.)
45. *Further Development of Beachlanding Craft in India and Sri Lanka*. A. Overa, R. Ravikumar, O. Gulbrandsen, G. Cowing. (Madras, July 1986.)
46. *Experimental Shrimp Farming in Ponds in Polekurru, Andhra Pradesh, India*. J. A. J. Janssen, T. Radhakrishna Murthy, B. V. Raghavulu, V. Sreekrishna. (Madras, July 1986.)
47. *Growth and Mortality of the Malaysian Cockle (Anadara granosa) under Commercial Culture : Analysis through Length-frequency Data*. Ng Fong Oon. (Madras, July 1986.)
48. *Fishing Trials with High-Opening Bottom Trawls from Chandipur, Orissa, India*. G. Pajot and B. B. Mohapatra. (Madras, October 1986.)
49. *Pen Culture of Shrimp by Fisherfolk : The BOBP Experience in Kiffai, Tamil Nadu, India*. E. Drewes, G. Rajappan. (Madras, April 1987.)
50. *Experiences with a Manually Operated Net-Braiding Machine in Bangladesh*. B. C. Gillgren, A. Kashem. (Madras, November 1986.)
51. *Hauling Devices for Beachlanding Craft*. A. Overa, P. A. Hemminghyth. (Madras, August 1986.)
52. *Experimental Culture of Seaweeds (Gracilaria Sp.) in Penang, Malaysia*. (Based on a report by M Doty and J Fisher). (Madras, August 1987.)
53. *Atlas of Deep Water Demersal Fishery Resources in the Bay of Bengal*. T. Nishida and K. Sivasubramaniam. (Colombo, September 1986.)
54. *Experiences with Fish Aggregating Devices in Sri Lanka*. K.T. Weerasooriya. (Madras, January 1987.)
55. *Study of Income, Indebtedness and Savings among Fisherfolk of Orissa, India*. T. Mammo. (Madras, December 1987.)
56. *Fishing Trials with Beachlanding Craft at Uppada, Andhra Pradesh, India*. L. Nyberg. (Madras, June 1987.)
57. *Identifying Extension Activities for Fisherwomen in Visakhapatnam District, Andhra Pradesh, India*. D. Tempelman. (Madras, August 1987.)
58. *Shrimp Fisheries in the Bay of Bengal*. M. Van der Knaap. (Madras, August 1989.)

59. *Fishery Statistics in the Bay of Bengal*. T. Nishida. (Colombo, August 1988.)
60. *Pen Culture of Shrimp in Chilaw, Sri Lanka*. D. Reyntjens. (Madras, April 1989.)
61. *Development of Outrigger Canoes in Sri Lanka*. O. Gulbrandsen, (Madras, November 1990.)
62. *Silvi-Pisciculture Project in Sunderbans, West Bengal: A Summary Report of BOBP's assistance*. C.L. Angell, J. Muir, (Madras, September 1990.)
63. *Shrimp Seed Collectors of Bangladesh*. (Based on a study by UBINIG.) (Madras, October 1990.)
64. *Reef Fish Resources Survey in the Maldives*. M. Van Der Knaap, Z. Waheed, H. Shareef, M. Rasheed (Madras, April 1991.)
66. *Improving Marketing Conditions for Women Fish Vendors in Besant Nagar, Madras*. K. Menezes. (Madras, April 1991.)
67. *Design and Trial of Ice Boxes for Use on Fishing Boats in Kakinada, India*. I.J. Clucas. (Madras, April 1991.)

Manuals and Guides (BOBP/MAG/.. .)

1. *Towards Shared Learning : Nonformal Adult Education for Marine Fisherfolk*. Trainers' Manual. (Madras, June 1985.)
2. *Towards Shared Learning : Non-formal Adult Education for Marine Fisherfolk*. Animators' Guide. (Madras, June 1985 .)
3. *Fishery Statistics on the Microcomputer: A BASIC Version of Hasselblad's NORMSEP Program*. D. Pauly, N. David, J. Hertel-Wulff. (Colombo, June 1986.)
4. *Separating Mixtures of Normal Distributions : Basic programs for Bhattacharya's Method and Their Application for Fish Population Analysis*. H. Goonetilleke, K. Sivasubramaniam. (Madras, November 1987.)
5. *Bay of Bengal Fisheries Information System (BOBFINS) : User's Manual*. (Colombo, September 1987.)

Information Documents (BOBP/INF/.. .)

8. *Marine Small-Scale Fisheries of Bangladesh : A General Description*. (Madras, September 1985.)
9. *Food and Nutrition Status of Small-Scale Fisherfolk in India's East Coast States : A Desk Review and Resource Investigation*. V. Bhavani. (Madras, April 1986.)
10. *Bibliography on Gracilaria – Production and Utilization in the Bay of Bengal*. (Madras, August 1990.)
11. *Marine Small-Scale Fisheries of West Bengal : An Introduction*. (Madras, November 1990.)

Newsletters (Bay of Bengal News)

Quarterly

Other Publications

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