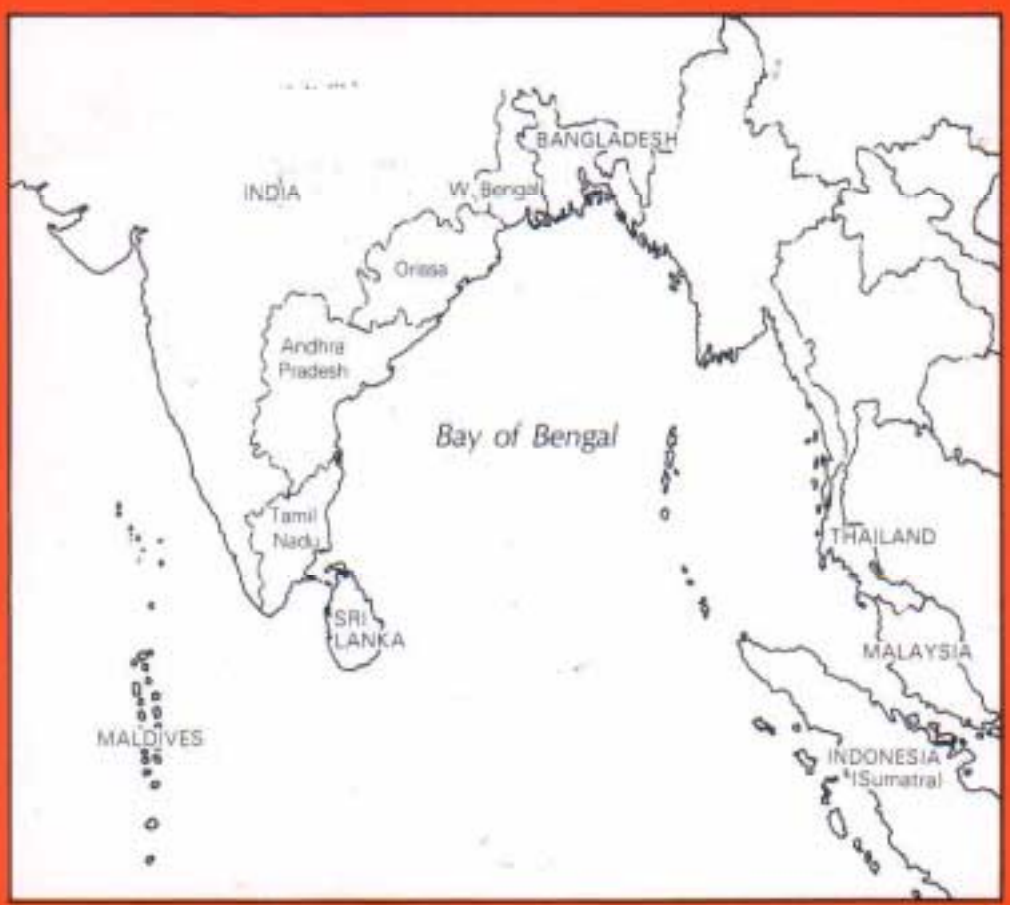
BAY OF BENGAL PROGRAMME

BOBP/REP/42

Report of the Twelfth Meeting of the Advisory Committee

Bhubaneswar, India
12 - 15 January 1988



FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

REPORT OF THE TWELFTH MEETING OF THE ADVISORY COMMITTEE

January 12—15, 1988
Bhubaneswar, India

Executing Agency:

Food and Agriculture Organization of the United Nations

Funding Agencies:

- Danish International Development Agency
- Swedish International Development Authority

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

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This document records the recommendations of the twelfth meeting of the Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP), held January 12—15,1988 in Bhubaneswar, India.

The document also includes the annual report for 1987 and the work plan for 1988, as endorsed by the committee, of the project "Small-scale fisherfolk communities in the Bay of Bengal", GCP/RAS/118/MUL. This project is the main component of the BOBP and became operational in 1987 with funding by DANIDA and SIDA. An outline of the Post-Harvest Fisheries Project, executed and funded by ODA (U.K.) under the BOBP umbrella, is also found in the document. This project also became operational in 1987.

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

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CONTENTS

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REPORT OF THE TWELFTH MEETING OF THE ADVISORY COMMITTEE — BAY OF BENGAL PROGRAMME FOR FISHERIES DEVELOPMENT

Opening of the meeting

1. The Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP) held its 12th meeting 12 to 15 January 1988 atthe Hotel Kalinga Ashok, Bhubaneswar, Orissa, India. A list of participants is set out in Appendix A.

2. The inaugural session of the Advisory Committee on 12 January was chaired by Ms. Zuridah Merican, Senior Fisheries Officer, Malaysia, representing the chairman of the 11th meeting of the Advisory Committee. Dr. A. Lindquist, Asst. Director General a.i. Fisheries Department, FAO, Rome; Mr. B. C. Sarma, Jt. Secretary (Fisheries), Ministry of Agriculture, Government of India; and Mr. P. Mohapatra, Director of Fisheries, Orissa, addressed the Advisory Committee at the inaugural session.

Election of Chairman

3. The Advisory Committee unanimously elected Mr. B. C. Sarma as its Chairman to hold office until the beginning of its 13th 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)

5. In presenting the Annual Report of **GCP/RAS/118/MUL (Appendix D)** at future meetings (a) special attention should be devoted to showing clearly the linkages between subproject objectives and outcomes and the overall objectives of the project. These linkages should be articulated for each reported and proposed activity, (b) in reporting on subprojects there should be performance reports in summary form that compare intended objectives and efforts made with performance and achievements quantitatively and/or qualitatively for subprojects implemented, and forecast performance 'budgets' for proposed subprojects.

6. In the field of extension, the project should, in addition to implementing the proposed subprojects, provide advice on the mechanisms and organizations suitable for effective extension systems.

7. An extension subproject should be prepared and implemented for the Maldives to answer its particular needs. Such a project should consider the option of utilizing the manpower of the Ministry of Fisheries and of other Ministries in implementation.

8. Subprojects aimed at the socio-economic betterment of fisherfolk should use an integrated and comprehensive approach and go beyond technical improvements and development of fisheries to address the real and felt needs of fisherfolk communities.

9. In order to make full use of the experiences of extension work in the different countries, exchange visits should be organized between countries.

10. In extension efforts at improving the soclo-economic betterment of fisherfolk, fishery resources aspects should be given due consideration.

11. The reasons for the disappointing outcome of the prawn pen culture trials in Killai need to be carefully investigated in order to further assess the potential of pen culture. However in view of the attractive features of prawn pen culture, the project should be tried in other sites in India.

12. The importance of prawn seed collection in Bangladesh and West Bengal in India is recognized, and particular attention should be given to nurseries and holding facilities for seed collectors.

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13. The economic feasibility of the proposed oyster culture trials in Malaysia should be carefully monitored. A model based on the experience of Thailand could be considered.

14. Exchange visits and study tours to countries in the region should be organized on various aspects of brackishwater culture within the work programme.

15. In the discipline of Fishing Technology the subproject in Indonesia should be further developed and implemented as proposed in the workplan.

16. In connection with introduction of beachlanding craft in India, asoutlined in the workplan, assistance should be given to West Bengal to introduce a couple of craft on a trial basis.

17. A subproject for introduction of hook and line fishing technology and hauling devices for boats in selected atolls should be prepared for immediate implementation in the Maldives.

18. The technical and economical feasibility of motorization of kattumarams in India should be further investigated.

19. The positive experiences of the new small offshore fishing boats in Sri Lanka could perhaps be utilized in other countries, and the project should help in this process.

20. The possibility of obtaining consultancy support from ODA for sail demonstrations should be pursued.

21. The work plan of the activity on set bagnet fishery in Bangladesh should be revised with emphasis on an action-oriented identification of supplementary or alternative means for improving the socio-economic condition of the fisherfolk dependent on this fishery and for reducing the damage caused to resources by this fishery.

22. In carrying out the activity on kattumaram fisheries in India, BOBP should ensure that the field survey in the workplan does not duplicate a recent techno-economic study of the kattumaram fisheries carried out in India,

23. In regard to Development Support the project should help its member countries in developing and preparing projects aimed at improving the socio-economic conditions of small-scale fisherfolk on request from such countries. These might include:

(a) project proposals for the socio-economic development of small-scale fisherfolk at selected locations in the east coast states of India.

(b) project proposals for resource material development aimed at fisherfolk *(i)* to supplement and enhance the existing scheme of mobile fisheries extension training systems for fisherfolk and *(ii)* to provide sea alert and safety at sea (sea rescue) facilities for the welfare of fisherfolk in Sri Lanka.

(c) project proposals for utilization of shell fish resources in Malaysia.

(d) project proposals for fishery resources studies in the coastal waters of Sri Lanka.

24. In regard to maintaining an overview of fisheries development in the region, it was considered to be part of the mandate of the BOBP to undertake this and to use the findings in its work. The BOBP should not however undertake the task entirely on its own but make use of studies and other material produced by FAO and other organizations.

25. The project's own resources in the field of Development Support should be devoted primarily to furthering the interests of the fisherfolk community project.

26. The vacant posts of Development Adviser and Socio- Economist should be filled as soon as possible.

POST-HARVEST FISHERIES—ODA

27. The ODA post-harvest fisheries project should support and assist other BOBP activities. In addition it should also focus its attention on the following areas:

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(a) Improvement of traditional drying and curing techniques such as sun-drying and salting including introduction of solar drying technology as appropriate.

(b) Use of ice and related methods for preservation of fish on board vessels to improve quality at the point of marketing.

(c) Marketing of fish products made by utilizing trawler by catch.

(d) Improvement of marketing infrastructure for increasing the incomes of fisherfolk and fish processors.

(e) Coordination of post-harvest inputs and reduction of under-utilization in the Maldives.

(f) Conversion of low-value fish into value-added products and shrimp feed.

28. The project should establish direct links with the FAO regional network on post-harvest losses headquartered at the FAO Regional Office for Asia and Pacific in Bangkok.

29. In initiatives to reduce the quantity of by-catch harvested during prawn fishing activities in the region, consideration should also be given to technical and managerial aspects.

BIO-ECONOMICS OF SMALL-SCALE FISHERIES—NEW PROJECT PROPOSAL

30. Noting that Indonesia, Malaysia, Maldives, Sri Lanka and Thailand strongly emphasized the importance of the proposed project in addressing the overall objectives of the 'Small-Scale Fisherfolk Communities' project, and had formally endorsed it, the Advisory Committee emphasized the urgent need for responses from the remaining cou ntries in order to enable submission of the project to the UNDP.

NATIONAL PROJECTS UNDER THE BOBP UMBRELLA

31. Pipeline projects should be submitted for funding consideration to UNDP as well as to other multi-bilateral donors.

32. BOBP should, wherever necessary and possible, provide bridging support to completed pilot projects in order to maintain the momentum between completion of the pilot project and follow-up donor funding for a full-scale project.

COOPERATION WITH OTHER ORGANIZATIONS

33. Suitable arrangements should be worked out for maximum utilization of already available bilateral SIDA funds for silvipisciculture activities in West Bengal in view of the great interest in this type of wcrk expressed by all participating countries in the 11th meeting.

34. Further cooperation with ICLARM in its areas of specialization should be taken up wherever possible. Such cooperation may include a joint workshop on management of resources which could possibly be accommodated within the bio-economics project.

35. BOBP should liaise with IMO in regard to matters concerning pollution from ships and safety at sea.

36. The possibilities for cooperation between BOBP and SEAFDEC in the area of fisheries training should be explored.

NEEDS FOR FISHERiES DEVELOPMENT IN THE REGION

37. The overview of fisheries development needs should take into account *inter al/a* the relevance of the following: fish marketing; post-harvest systems; financially viable credit schemes; welfare or social security systems; the use of NGOs in fisheries development and the role of women in fisheries credit.

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38. The idea of setting up financial institutions to cater exclusively to the credit needs for small-scale fisheries development should be promoted.

39. The replication of a Orissa type credit project in other parts of the region should be actively considered.

OTHER MATTERS

40. The agenda of the 13th meeting of the Advisory Committee should provide for an assessment of the overall development needs of the region and a discussion on the achievement of the overall objectives of the BOBP in relation to such needs as the first substantive item of the agenda.

41. The list of externally supported projects in the Bay of Bengal region should be updated and presented annually to the Advisory Committee in connection with the first substantive agenda item.

DATE AND VENUE OF THE NEXT MEETING

42. The Advisory Committee noted with appreciation that the offer made by Malaysia at its 11th meeting to host the 13th meeting together with the 6th Session of the Bay of Bengal Committee in Malaysia continued to be open, subject to confirmation by the Government. The dates suitable for the meeting would be towards the end of January 1989.

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Appendix A

LIST OF PARTICIPANTS

Bangladesh

Mr. Ataur Rahman	Project Director Marine Fisheries Research Management & Development Project CGO Building No 2 Agrabad, Chittagong
Ms. Monowara Begum	Asst. Chief, Planning Cell Ministry of Fisheries & Livestock Govt. of the People's Republic of Bangladesh; Bangladesh Secretariat Dhaka

DANIDA

Mr. J. Jensen	Fisheries Adviser Technical Advisory Division Ministry of Foreign Affairs 2 Asiatisk Plads, DK 1448 Copenhagen K
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FAO

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Mr. U. Tietze	Fishery Industry Officer Fisheries Department Rome
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Mr. R. J. Martinez	Senior Liaison Officer Field Programme Dev. Div. Rome

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Mr. S. K. Das	Deputy Commissioner (Fisheries) Ministry of Agriculture Government of India Krishi Bhavan New Delhi 110 001
Mr. V. Manivannan	Director of Fisheries Government of Tamil Nadu Administrative Office Bldg. Teynampet Madras 600 006
Mr. A. K. Patnaik	Director of Fisheries Directorate of West Bengal B—B Lindsay Street Calcutta 700 016
Mr. D. Janardhan Rao	Director of Fisheries Tank Bund Road Hyderabad, Andhra Pradesh.

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Mr. Buhauli Panjaitan	Chief, Sub- Directorate Fishing Productivity Directorate General of Fisheries JL Harsono Rm No 3 Ragunan Jakarta 12550
Mr. Suseno	Chief, Programme & Project Section Directorate General of Fisheries Jakarta 12550

Malaysia

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Mr. Ng Fong Oon	Fisheries Officer Fisheries Research Institute Jalan Akuarium Penang.

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Ma/dives

Mr. N. T. Hasen Didi	Senior Under-Secretary Ministry of Fisheries Male
Mr. Hassan Maniku Maizan	Senior Fisheries Development Officer Marine Research Section Ministry of Fisheries Male

ODA

Dr. G. R. Ames	Project Adviser Overseas Dev. Natural Resources Institute 56 Gray Inn Road London WC1X 8L

Sri Lanka

Mr. A. Atapattu	Director of Fisheries (Marine) Ministry of Fisheries, New Secretariat Maligawatta, Colombo 10
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BOBP—SECRETAR/A T

Mr. L. O. Engvall	Programme Director
Mr. C. Angell	Snr. Aquaculturist
Mr. G. Pajot	Snr. Fishing Technologist
Mr. R. N. Roy	Extension/Training (Consultant)
Dr. K. Sivasubramaniam	Snr. Fishery Biologist
Mr. D. J. Walker	Post-Harvest Fisheries Adviser
Mr. A. Kashem	Project Officer (Bangladesh
Ms. S. Scurville	Senior Secretary

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Appendix B

AGENDA

Tuesday 12 January, 1988

1. Opening of the Meeting
2. Election of Chairman
3. Adoption of Agenda
4. "Small-Scale Fisherfolk Communities" (GCP/RAS/118/MUL) — funded by DANIDA/SIDA, executed by FAO.

Wednesday 13 January 1988

5. "Post-Harvest Fisheries" —funded and executed by ODA.
6. "Bio-economics of small-scale fisheries" — new project proposal
7. National projects under the BOBP umbrella.
8. Cooperation with other organizations.
9. Needs for fisheries development in the region.
10. Other matters
11. Date and venue of the next meeting.

Thursday 14 January 1988

12. Field visit to Puri.

Friday 15 January 1988

Adoption of the report

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Appendix C

LIST OF DOCUMENTS

1. List of documents
2. **Agenda**
3. List of participants
4. GCP/RAS/118/MUL — Annual report — 1987
5. ODA "Post-Harvest Fisheries Project" — summary and work programme proposal.
6. Bio-economics of small-scale fisheries — project proposal.
7. Summary of national projects under the BOBP umbrella
8. Externally supported projects in the BOB region.
9. Fisheries development needs in the BOB region — A preliminary review.

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Appendix D

GCP/RAS/118/MUL: ANNUAL REPQRT—1987

Introduction

1. The project "Small-Scale Fisherfolk Communities in the Bay of Bengal — GCP/RAS/118/MUL" commenced in 1987. The five-year project is funded jointly by DAN IDA and SIDA to to the tune of US $ 8 million shared equally between the two agencies. In addition, the participating countries (Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, Thailand) will provide abcut $ 500,000 in cash contributions. FAO is the executing agency. The main purpose of the project is to develop, test and demonstrate ways and means by which socio-economic betterment of small-scale fisherfolk can be achieved. Further details are provided in a summary of the project document (Annex 1).

2. At present the project constitutes one, but by far the largest component, of the Bay of Bengal Programme (BOBP) for Fisheries Development. The other component is a project for "Post-Harvest Fisheries" funded and executed by the ODA of UK. It started mid-1987 and has an initial duration of two years at a budget of about $450,000. BOBP was established in 1979 by the SIDA-funded project "Development of Small-Scale Fisheries in the Bay of Bengal", RAS/040/SWE. That project had two phases and lasted till 1986. It was joined by a UNDP-funded project on "Marine Fishery Resources Management", RAS/81/051, in the period 1983-86.

3. The work of the project (and other BOBP projects) is overseen by an Advisory Committee that meets once a year. The members of the committee are the participating countries, agencies funding the projects and the FAO. The work programme of RAS/118/MUL was first discussed in the 11th meeting of the Committee held in Bangkok in March 1987. Its report is published in BOBP/REP/38. Since 1987 was the first year of operation the work programme was sketchy: some work not completed by the previous, project (RAS/040/SWE) was continued, and new activities were to be prepared. There have been no significant deviations from the Committee's recommendations in implementing the work programme. In general, however, delivery has been a little slower than anticipated. This implies that funds available for the year have not been fully utilized.

4. In accordance wiih the project document the work has been organized in three major disciplines — i.e. Extension, Brackishwater Culture and Fishing Technology. A fourth discipline, Fishery Resources, has been maintained during the year as recommended by the Committee in its 11th meeting. This was seen as a temporary arrangement, at least until the next meeting, pending the outcome of the proposal for a new "bio-economics" project. The fifth discipline is Development Support: this aims at expanding and furthering the project's objectives. It is multi-disciplinary in character, and interacts with all the others. Common for all the disciplines is the Information Service which helps to prepare and disseminate information about the project's work and related issues. The work undertaken during the year and future plans are described below under the six headings just mentioned.

5. The report that follows summarizes and comments on the major activities undertaken in 1987. The intention is not to produce a full account of project work but rather to highlight the major achievements, problems and issues so as to facilitate discussion in the 12th Advisory Committee Meeting. Details are found in the quarterly progress reports, in technical reports and working papers to be published, and in the *Bay of Bengal News.* In discussing the progress Of particular subprojects or activities, future work is outlined and supplemented with specific targets of the work plan proposed for 1988 (Table 1).

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Extension

6. Subprojects inherited from RAS/040/SWE and therefore ongoing at the beginning of 1987 were People's Participation and Extension Services in Ranong (Thailand). The former was scheduled to be completed as a separate exercise in the middle of the year. A new subproject originally envisaged as a credit and training project was to be started in Indonesia.

New subprojects concerning training of trainers including non-government personnel were to be prepared in Bangladesh, India, Maldives and Sri Lanka. The Committee had also recommended the preparation of a subproject for credit in Sri Lanka.

Further identification of problems in the set bagnet fisheries of Bangladesh was also recommended. Since this is a typical case of "bio-economics" it is described under Fishery Resources.

7. *People's Participation* (PEP): The purpose was to identify and develop issues which would lead to the formulation of methods and organizational strategies for people's participation in preparing and implementing of fisheries and fisherfolk development projects. It was planned as a one-year exercise with funds provided by SIDA over and above the contribution to RAS/040/SWE.

As outlined in the 1987 work plan, the subproject comprised a series of different activities under three broad categories — studies; appraisals of PEP in past and ongoing projects; and action research in BOBP subprojects. All the material was brought together and discussed in a one-week international consultation.There were 43 participants—representatives from the BOBP member-countries, from international aid agencies and from NGOs; development administrators; fisheries scientists; social scientists; and BOBP staff. An article in *Bay of Bengal News* **No 27, summarizes the outcome of the consultation.**

The learning from the one-year PEP exercise was at two levels: the studies and the appraisals provided an understanding of the concepts and issues involved; the action research, on the other hand, confronted these concepts and issues with day-to-day realities in project work which led to experiences that BOBP and others might make use of in the future.

At the conceptual level the cooperative study in Tamil Nadu showed that people's perceptions of an organization not only determine the way people use the organization to their ends but also the very way it functions. It showed that one needs to worry about and make special efforts to ensure that people perceive organizations and technologies in the way intended.The ICLARM study of traditional management of fishery resources showed that given the right socio-economic, historical and environmental factors, communities have in the past managed their resources. But it also showed that these mechanisms tend to break down under conditions of increased population and fishery effort, particularly when other communities and fisheries begin to operate. There is a need to look for new types of organizations which, while being based on environmental, socio-economic and historical contexts, can give people ways to understand and manage their resources under the larger more complex situations prevailing today.

As for the appraisals of PEP in projects past and present: the West Bengal government effort showed that traditional government departments can be participatory, provided the political system is committed to it and is willing to build in accountability into the process by using existing and new people's organizations. The case studies of fisherfolk organizations in the developed world showed that the developing world is facing very similar problems, and that it would be useful to learn of the factors that enabled fisherfolk in the developed world to organize themselves and to manage their fisheries. A central issue that surfaces from these studies is that organization of fisherfolk may be the key to participative development. The dilemma of BOBP and other similar organizations then is what its role should be in using and promoting existing organizations, and in the much more complex situation of actually enabling organization of people. In a meeting with NGOs in India several ideas on how to achieve better PEP emerged, *(Bay of Bengal News* No 25). In the final analysis it was felt that participation was really an attitudinal stance, an approach based on belief rather than on something that could be achieved through cut and dried methods and techniques. A similar NGO meeting in Sri Lanka *(Bay of*

Bengal News, No 27) stressed the need for participation among the various organizations and resolved to establish a network of NGOs supporting fisherfolk. The appraisal of PEP in past BOBP subprojects revealed that it had been a prominent feature in the Extension activities *(Bay of Bengal News,* No 26) but much less so in the technical disciplines of Brackishwater Culture and Fishing Technology.

The action research brought the PEP exercise down to earth. An effort at participatory shrimp pen culture in Sri Lanka shows that the allocation of scarce resources (in this case lagoon space) is a complex and conflict-prone area and that the entire community must participate in facing up to the issue and its implications. The issues that have come up are being discussed with the authorities to better prepare the policy on shrimp pen culture and on lagoon space allocation. The effort at participatory seaweed culture in Tamil Nadu shows that when properly done, communities can be enabled to take responsibility for culture trials even to the extent of providing inputs into the technology development. Participatory planning and implementation does not get rid of problems and conflicts, but it does raise them and often provides for mechanisms by which such problems and conflicts can be resolved. In summary, the participatory effort in a project seems to help in a few distinct ways:

(a) It helps define problems and prioritize them from the people's point of view. This helps enormously in determining the interest and commitment of the community to an effort.

(b) It helps people to understand the technologies and methods at first hand, so they can take decisions on accepting and adopting them with a better understanding of the social and economic implications.

(c) It helps in technology transfer, as people learn by doing not just the technology but the management.

(d) It builds confidence in people — in their ability to identify problems, understand them, come up with solutions, organize themselves and to work towards resolutions.

(e) It builds understanding, and an openness that enables communities to confront and often resolve conflicts.

Under the PEP strategy, participation is not restricted to fisherfolk alone: The participation of government fisheries staff is crucial. Most development projects will be implemented with the participation of the officers, who in time will involve the fisherfolk. Besides BOBP staff, some counterparts have learned a lot from the PEP exercise. It is hoped that BOBP can enable many more of them to go through the same learning process, and come up with new approaches — such as the Tamil Nadu government's efforts to bring together fisherfolk in planned consultations to better understand their perceptions and concerns.

People's Participation as a separate subproject was terminated in 1987 and a report on it is being issued. The spirit of PEP, however, and the lessons learned, will continue to be applied in all of BOBP's work. Increasingly, BOBP staff are putting to use the learning from PEP studies in their day-to-day activity. An attempt will also be made to formulate practical guidelines for PEP in fisheries development, including a manual on Rapid Rural Assessment in fisheries.

8. *Extension services for small-scale fisheries in Ranong, Thailand:* The purpose is to test and demonstrate an extension mechanism consisting of provincial fishery officers (PFO) and Community Development Officers (CDO) with technical backup from specialised fisheries research and development stations. The planning of this subproject started in 1986. In the beginning it also contained a resources management component — which however had to be deleted since the UNDP-funded resources project was not extended beyond 1986.

A well-manned and equipped office has been established in Ranong. Orientation training in extension approaches was provided for all staff at headquarters, research stations and at the province that are concerned with the subproject. CDO were also given training in fisheries matters.

The first step in establishing the extension mechanism has been to learn more about the fisherfolk and their villages. Field surveys have been undertaken by project staff and CDO. The

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outcome: profiles of some 53 villages provided basic information on demographics, fisheries and infrastructure. Secondly, there is a cost and earnings study of all important types of fishing units used in the province. Thirdly, there is an analysis of credit needs. Reporting was almost completed at the end of the year, and an analysis of the findings and identification of follow-up actions are scheduled for the early months of 1988.

Parallel with the studies, action-oriented extension efforts were undertaken in fishing technology. The manufacture and use of a new type of collapsible crab trap was demonstrated to 15 fishermen from different villages. Material was also provided for manufacture of about 25 traps to be used on a trial basis. A preliminary evaluation of the trials at the end of the year indicate some positive developments. The quality of the data is not very high due to the reluctance and inability of the fishermen to supply them, but there are a few cases of very satisfactory income. In addition, there is clear qualitative evidence of intensive use of the traps in some villages. It is also reported that a crab trader has started to manufacture traps and issue them on credit against supply of crabs. Another positive sign is that the CDO in one village trained 38 fishermen as a separate exercise and provided each participant with 2—4 traps to try out. It is proposed to continue monitoring the fishing trials and to provide further training-cum-demonstration for two groups of 10 members each on a district basis in 1988.

Another action-oriented extension activity concerns oyster farming. The work started with a study tour for about 35 potential oyster farmers from different villages to Surat Thani on the east coast of Thailand where commercial oyster culture is very successful. Thereafter about 20 of these participants were provided further training in oyster culture. Two groups of 10 members each were formed and they started to fabricate cement poles (cultches) for the grow-out culture. Material was provided by the project while the members provided the labour. At the same time spat collection activities were started in Ranong itself and in Phang Nga. At the end of the year, about 50 per cent of the cultches (500 per man) had been manufactured, but the spat collection failed in both locations. As a last resort, towards the end of the year, new collection attempts were made in Surat Thani. The spat collection will continue in all three locations to complete a one year cycle. In the meantime, the manufacturing of cultches has been slowed down.

Several other technical extension activities have been identified. They include crab fattening, cage culture of fin fish and squid fishing by traps which, subject to further techno-economic appraisal, will be experimented with in the coming year.

Despite some problems, like the failure to obtain spats, the technical activities are well in hand, under a competent and dedicated staff with support from the specialised research stations. In the field of extension, however, the effort needs to be intensified. It has been agreed that one of the project biologists on the staff will be replaced by a sociologist. A new BOBP project officer-cum-sociologist will be recruited and an effort will be made to obtain the services of an Associate Professional Officer (sociologist) through FAO. Also in the extension work, firmer and closer collaboration should be established with the CDO.

Besides some reorientation in the direction of the work, this subproject could serve as a model for other BOBP subprojects in respect of counterpart commitment and inputs.

9. *Improved earnings of coastal fisherfolk in North Sumatra, Indonesia:* The quantitative and qualitative objectives of this subproject are to be formulated on-line in a participatory manner and may include demonstration of a viable credit system and demonstration of other means of improving socio-economic conditions which might be identified during the initial field enquiries.

In consultation with the Indonesian authorities it was agreed that the project's effort in Indonesia should be limited to the east coast of North Sumatra which has a large concentration of fisherfolk populations. A profile of the area is given in *Bay of Bengal News,* No 28. The first identification mission undertaken by two consultants recommended a credit programme with large components of training in two of the districts. This was later reduced to one district (Langkat) and the specific purpose was kept more open allowing for modification through people's participation during subsequent field studies and consultations with fisherfolk.

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An office has been established at the Provincial Fisheries Service (PFS) in Medan. The first activity was to give training to general extension staff (PPL), bank officers and representatives of a women's organisation (PKK). This training aimed at familiarising the non-fisheries staff with small-scale fisheries in general and North Sumatra fisheries in particular; and with BOBP's extension approach and envisaged activities. The second exercise was a workshop in which staff of PFS, PPL and PKK were trained to undertake field enquiries in Langkat district. The field enquiries are meant to obtain an understanding of the dynamics of the communities, identify the fisherfolk's need and priorities, identify mechanisms by which fisherfolk could actively participate in project activities, understand the economics and the practices of enterprises that fisherfolk use and to suggest project options and modalities. The field enquiries were in progress at the end of the year.

The plan for 1988 is first to analyze the results of the field enquiries, and thereafter to undertake a more detailed analysis of the costs and earnings of selected types of small-scale fishery enterprises. It is hoped that after analyzing this information, a credit scheme can be formulated and that other measures to improve fisherfoik's conditions can also be pursued with the participation of the fisherfolk themselves.

10. *Training of trainers:* Identification, and to some extent preparation, of suitable activities concerning training of extension personnel have been undertaken in Bangladesh, India, and Sri Lanka. Similar work in Maldives has been scheduled for early 1988. A major consideration in expanding and improving the extension services was the engagement of various types of NGOs. In order to obtain a better idea about the role and competence of NGOs concerning support to fisherfolk, NGO inventories have been undertaken in all the three countries. It reveals that the prospects for any massive extension effort through NGOs are slim but there might be some opportunities worth trying. Keeping in mind that BOBP's input should not and cannot be of the saturation type but innovative and experimental in nature, different activities in the respective countries are proposed.

In *Bangladesh,* a scheme is being prepared for extension development which proposes to take staff of the DOF, NGOs and banks through a participatory training exercise which will enable them to better understand fisherfolk communities and their needs and to plan and implement small extension schemes. Details of the training are being worked out. Counterpart commitment and inputs are crucial in this type of project, and it is only after clear evidence of this commitment that the subproject will start.

In *India,* it is proposed to select a few reputable NGOs already active with fisherfolk in the four east coast states; and to work together with them through the respective departments of fisheries in implementing extension activities which are yet to be determined. The dialogue with some NGOs has started.

In *Sri Lanka,* it is suggested that support be extended to creating a network of fisheries NGOs. Such a network will liaise better with government authorities and donor agencies and secure more effective and comprehensive services to fisherfolk. It is also proposed to assist in establishing a nationwide fisherfolk radio programme to enable two-way communication with fisherfolk on extension and welfare schemes, marketing information, the weather, and other subjects of interest to them.

11. *Credit:* To demonstrate improved credit facilities for small-scale fisherfolk and for this purpose to strengthen the bank and fisheries institutions concerned, a subproject has been prepared in Sri Lanka. It is based largely on the BOBP experience from the credit project in Orissa, India. The proposed pilot project is envisaged to concentrate on three districts in the south of Sri Lanka. It has major training components for bank staff (central and regional offices and branches) and fisheries extension officials (headquarters and districts). The two banks to participate are the People's Bank and the Bank of Ceylon. The first year will be devoted to studies of the fisherfolk, their economic activities, their credit needs and modalities for providing credit. A project proposal was formulated with the assistance of a consultant in June 1987 and it has since been with the banks for their consideration.

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Brackishwater culture

12. The work programme during the past year, as recommended by the Committee, consisted of two subprojects continued from RAS/040/SWE, namely pen culture of prawns in India and Sri Lanka, and two new subprojects dealing with seaweed culture in India and Sri Lanka.

Besides, new subprojects were to be prepared for oyster culture in Malaysia and India, artemia propagation in India, silvipisciculture in India, aquaculture potential in the Maldives, shrimp feed in India and Sri Lanka and collection of prawn fry in Bangladesh. Oyster culture in India has not been pursued, mainly because of the low marketing potential, and no aquaculture work will be done in the Maldives in agreement with the authority concerned.

Work during the early part of the year also included the finalization of reports of earlier RAS/040/ SWE activities, not mentioned elsewhere in this report. They relate to seaweed culture in Malaysia (BOBP/WP/52) and cockle culture, also in Malaysia. *(Bay of Bengal News,* No 26).

13. *Pen Culture of Prawns in India and Sri Lanka:* The purpose is to investigate and demonstrate the commercial viability of pen culture of prawns with the participation of fishing families. Prawn culture trials in pens were started by BOBP in 1982 at Killai near Chidambaram in Tamil Nadu. The first 2.5 years was a technical phase during which the technology was experimented with and refined. During 1985-86 a semi-commercial phase was undertaken in close cooperation with fishermen from the local community at Killai. These trials were based on the natural stocking of *P. indicus* twice a year. A satisfactory biomass was achieved during the trials but because of the relatively small size of the prawns, the culture was not economically attractive. The breakeven point was just about reached (BOBP/WP/49). It was then felt that the only way of making the culture economically viable would be to rear *P. monodon* and to use hatchery-produced seeds since they were not available in sufficient quantities in the wild.

The trials with *P nionodon* during 1987 were a complete failure; and it has been decided to close down the activity at the end of the year. During the first culture cycle, problems were experienced in obtaining prawn seeds in required quantities and at the required time. Later on, growth arid survival were poor both in the happas during nursery and in the pens during the grow-out period. The feed supply was considered to be one of the major factors in the failure. During the second culture cycle, the manufacturing of feed was improved by better stocking of ingredients and better equipment for processing. Ready-made feed already tested in Sri Lanka was also imported and used on a trial basis. The culture results, however, were the same as for the first cycle or even worse. There was hardly any recovery and the growth was less than normal in four out of six pens.

It hasn't been possible to pinpoint any specific reason for the failure. It is believed that environmental conditions at the site may not be conducive to pen culture, that exchange of water is too sparse, and that it was particularly so during the recent past - since the mouth of the lagoon was closed all through a prolonged period of drought. But it may not be the only reason; others could relate to the feed, poaching, management, etc. An evaluation of the entire Killai project will be undertaken in the first half of 1988 in the hope of extracting important lessons learnt during the long trial period. An important component of the evaluation will be the views of fishermen who participated in the trials and the views of the community.

Parallel with the trials in India, pen culture trials of prawns was also taken up in Sri Lanka in 1984. Initial trials in the Negombo lagoon in connection with BOBP's establishment of a hatchery in Pitipana were not entirely positive but showed some encouraging results. In the later half of 1986, therefore, trials were started in the Chilaw lagoon at a site which was thought to be more promising than the site in Negombo.

The growth of the *P. monodon* during the first culture cycle was found to be excellent. The prawns reached a size of about 30 g. after about 100 days. The feed used was produced by a feedmill in Sri Lanka with a composition recommended by the project. Unfortunately, just before the harvest, one of the pen walls was damaged and most of the prawns managed to escape. The second harvest staggered over about 2.5 months yielded in one of the pens 230kg/ha and in the other 720 kg/ha. The surplus after deducting costs for seeds and feed was about

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Rs. 16,000. The third cycle started off well with 80 per cent of survival after the nursery phase. However, unusually heavy rains occurred in October, forcing an emergency harvest.

The two pens (.25 ha and .18 ha) are being looked after by three fishermen hired bythe project. Efforts have been made to involve the local village Social Development Organisatioi (SDO) in the trials. The relations between the project and the SDO have experienced both uos and downs. Although only one harvest out of three produced satisfactory results, the SDO has got interested in the technology and requested support in setting up two new pens of .25 ha each which the project will support through 1988. It is also suggested that the trials in the project pens be continued through 1988. Attempts will be made for a continuous staggered harvest of commercial-size prawns with a continuous supply of new juveniles. If these trials do not show clear positive results during the year, it is suggested that pen culture trials be terminated altogether.

14. *Seaweed farming in India and Sri Lanka:* The purpose is to assess and demonstrale the technical, economic and social feasibility of small-scale seaweed farming with active community participation.

In India the farming sites are located in Ramnad district in the southern part of Tamil Nadu where there is a tradition of seaweed collection and drying *(Bay of Bengal News,* No 28). The preparatory work was started by a small team of sociologists that visited 15 villages in the area and probed their interest in participating in farming trials. The 15 villages were reduced to 5 that showed some interest, and of these two were eventually selected (Vedalai and Chinna-palem).

After selection of the villages a community development officer assisted in establishing vil!age committees to be responsible for the farming trials. Through these committees, a spore-setting shed was put up in Vedalai and 9 pilot farms totalling 4.5 ha were established by erecting stone posts between which spore-bearing rafia lines will be suspended. Problems in obtaining power connections for the spore setting facilities delayed the work, but at the end of the year the spore setting was started and lines were put up.

Despite some delays, the subproject has had a good start and the first harvest is anticipated in the first half of 1988. The process of selecting villages and of establishing implementing mechanisms in the villages is a good example of the people's participation approach already discussed above under Extension. Parallel with these production trials, BOBP's ODA project will look into post-harvest aspects: the preservation, processing and marketing of seaweed.

In Sri Lanka the work has been delayed pending the settlement of a suitable implementation mechanism within the Ministry of Fisheries. Towards the end of the year it was agreed that the farming trials at the village level will be organised by a NGO, Sarvodaya Shramadana Sangayama Inc. while the National Aquatic Resources Agency (NARA) will undertake the necessary tech-nical and research oriented development work. A preliminary selection of villages around the Puttalam lagoon has been made. Everything therefore seems to be set for implementation of the subproject during 1988, which will encompass the establishment of a spore-setting facility and pilot farms and start of farming trials.

15. *Oyster culture in Malaysia:* An outline of a subproject has been agreed upon with the DOF in Malaysia. The implementing institution is the Fisheries Research Institute of Penang. The initial main components are spat collection and a marketing study. The lalter has been subcontracted to INFOFISH. The availability of spats and knowledge about the marketing outlets are prerequisites for successful oyster culture, and these activities can therefore be considered as being preparatory. The marketing study has already started, while spat collection activities are scheduled to commence in February. During the year a preliminary socio-economic study has been undertaken at one of the potential sites for culture (Langkawi).

The main work during 1988 will therefore relate to spat collection activities. If a positive out-come is obtained early, socio-economic studies may be launched and people's participation in oyster culture initiated.

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16. *Artemia propagation:* The feasibility of anemia prcpagation in salterns in Tamil Nadu and the southern part of Andhra Pradesh is being investigated. An artemia expert was to be hired as consultant but the time between the 11th AC meeting and the end of the salt manufacturing season was too short for the consultancy to materialise. It's now scheduled for March/ April 1988.

In the meantime, a study of the socio-economics of salt manufacturers in the Covelong areas south of Madras has been undertaken. The study reveals a very complex social picture, under which manufacturers are exploited by traders and money-lenders. Several government institutions are involved in the business. They support the manufacturers, but so far the latter have derived little benefit. It appears that a lot of organizational work is required before an effective people's participation in artemia propagation, for instance, can be achieved. Furthermore, preliminary investigations indicate that there are problems with the quality and quantity of the water used for the salt manufacturing. From both the social and technical standpoints, it therefore seems too early to start a demonstration project. The first phase would have to be technical experiments only. It is also important to note that salt manufacturers are not small-scale fisherfolk and therefore do not belong to the target group of the project.

A preliminary overall conclusion is that artemia propagation will not be a suitable subproject under BOBP. However, it is suggesled that the feasibility study be completed, and that a workshop is organized with interested parties in India and perhaps some specialists from outside to discuss the findings and as appropriate prepare a project proposal which could be taken up under another development scheme.

17. *Silvipiscicu/ture in West Bengal, India:* In 1986 BOBP was requested to assist SIDA and the Forest Department of West Bengal in improving the fish/prawn farming aspects of their silvipisciculture project in West Bengal. The project aims at establishing new forest areas within embankments in the semi-saline zone of the Sunderbans. Trees are being planted on ridges and fish are farmed in the dykes created by ridge construction. *(Bay of Bengal News,* No 27). During the year assistance has been provided in aquaculture engineering to improve the sluice gate design and the general engineering aspects of the embankments and ridges. At the end of the year a socio-economic study was undertaken in the villages in the vicinity of the silvipisciculture project. The study also attempted to identify approaches to people's participation in utilizing the projects' benefits.

It appears that the Forest Department's interest in pisciculture is not of a long-term nature; its main concern is to recover some of the costs that new forest areas entail. However, the communities in the vicinity of the project and in other areas where similar silvipisciculture arrangements could be made could benefit a lot from such systems. From the ecological point of view too they are very attractive: they reinforce and do not disturb the natural eco system. It is therefore suggested that arrangements be worked out to continue the support to silvipisciculture activities. Failing such arrangements, other ways and means will be devised to support an aquaculture subproject in West Bengal.

18. *Prawn feed manufacturing:* During the pen culture trials of prawns in India and Sri Lanka, one of the major bottlenecks was the non-availability of suitable feed. In Sri Lanka it was possible to establish cooperation with a national feed mill to produce on a trial basis a feed based on a composition of Japanese origin recommended by the project. During the trials in Sri Lanka, this feed has been found suitable. In India, local manufacture of feed was tried out from the start of the trials in Killai. Offal from squids and similar products were used in the beginning, but the manufacture got gradually more sophisticated; during 1987, a feed similar to the one in Sri Lanka, with many different ingredients was manufactured. As already stated, the trials were not successful and one of the reasons could be the quality of the feed.

BOBP's prawn farming trials and the attempts to manufacture a suitable feed for prawns have highlighted problems rather than generated solutions. But it can be safely concluded that a high quality feed required for satisfactory growth cannot be manufactured by the small farmers themselves. The operation is too sophisticated in terms of management, equipment, and purchase and storage of ingredients.

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It remains to be investigated if the feed can be economically produced by large feed mills only, or whether there is room for small-scale industries also. The new ODA post-harvest fisheries project will look into these matters and other issues concerning prawn feed.

19. *Prawn seed collection in Bangladesh:* In connection with BOBP's earlier work to establish a demonstration farm for prawn and fish at Satkhira, problems were encountered in obtaining seed collected in the wild. Since high-quality sea water is required for producing penaeid prawns in hatcheries, the possibilities of establishing such hatcheries in Bangladesh are very limited. The prawn culture will therefore continue to depend on collection of wild seed. The magnitude of the problem was highlighted in a Minor Field Study sponsored by SIDA under which it was found that up to 25,000 people, many of them women and children, are engaged in prawn seed collection in Satkira district during the peak season. Subsequent information indicates that prawn seed collection is intensive in other areas as well as in Khulna district, and in Chittagong and Cox's Bazar in the western part of the country. Thus shrimp seed collectors constitute a large target group that qualify for BOBP support. A pilot study to learn more about it was undertaken in the Cox's Bazar and Khulna areas through a consultant group in Bangladesh.

The Khulna report was not yet available, but from Cox's Bazar it is reported that as many as 40,000 people may be engaged in seed collection during the peak season. Most people do it as a part time job, but some communities are wholly dependent on the prawn seed. For the mitis a last-resort occupation: there is little else they can do. Only tiger prawn seed commands commercial value: this contributes only a small fraction of what is collected in the nets. The collectors have a feeling that considerable resources go waste and would like to try commercializing other species *(Machrobrachium sp.* ?). They would also like to improve their bargaining position vis-a-vis the traders. More importantly, their other needs and aspirations are dykes for flood protection, credit, boat ownership, farming, livestock, etc.

Besides assistance to the communities, another objective of a project concerning prawn seed collection would be better management of the resource by improving the survival of seed and cutting down of by-catch losses.

It is too early to say in what way prawn fry collectors can be helped. The work during 1988 will aim at identifying technical possibilities of improving the collection, handling and transport of seed and at starting experimental work. The other important aspect will be to further study the other needs of the communities and formulate if possible remedial action that can be taken up under the subproject or under other assistance schemes.

Fishing technology

20. Two ongoing subprojects from RAS/040/SWE — Introduction of Beachlanding Craft in India and Fishing Boat Development in Sri Lanka—constituted a major portion of the work programme for 1987.

A new subproject on motorization of Chandi boats in Bangladesh was taken up but is described under Development Support since it is a follow-up of earlier BOBP work and does not contain any further elements of technology development.

Other areas to be looked into for identifying and preparing subprojects were small-scale fishing technologies in Indonesia and the Maldives, and motorization of country craft and improvement of or development of alternatives to the Kattumaram.

Services have also been provided on a reimbursable basis to the two FAO/TCP projects for Exploratory Tuna Fishing in Maldives and Sri Lanaka, to a Reef Fisheries project in Maldives, **to a FAO/TCP** project for construction of Ferrocement Boats in India and to a NORAD supported project for Motorization of Dinghies in Orissa, India.

21. *Beachlanding Craft* (BLC): To develop and demonstrate beachlanding craft as an alternative to kattumarams and other local craft to enable beach-based coastal fishing communities to increase their productivity and incomes and harvest unexploited resources.

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BLC development is the oldest subproject of BOBP. It started way back in 1980 with tests of a few prototypes. Altogether about a dozen prototypes of different designs, sizes and materials were built and tested until two feasible solutions were ready by 1984 (IND-20 and IND-25). Monitoring of BLC performance to investigate their commercial viability was started at that time, In 1985, BLCs were commercially produced by shipyards in Andhra Pradesh, Orissa and Tamil Nadu. The Government of India had at that time sanctioned a 50% subsidy scheme for production of 90 BLC on the east coast of India and the plan was to introduce 500 BLC during the existing 5-year plan. A beach-hauling winch to facilitate the handling of the BLC on the beach was also developed, tested and put into regular use in 1985. The work plan for 1987 has been followed closely and the situation at the end of the year on various aspects is as follows:

About 100 BLCs have been produced by commercial boatyards at the end of 1987 (of which 15 have been delivered to Kerala). Most of them (over 50) operate from Andhra Pradesh. Efforts have been made to obtain data on their performance, but information has been received from very few centres along the coast. However, from first hand observations in most of the BLC villages, one gets a general picture of the performance. It varies from excellent to acceptable to dismal, with "acceptable" being the largest category. The main reason for poor performance is lack of fishing gear; in many cases it was not supplied together with the craft; this happened in Orissa and Tamil Nadu. The second most important reason for poor performance is the ownership structure. The boats are given to cooperatives. In some places, notably in Tamil Nadu, the fishermen from the cooperatives use the boat by rotation. This leads to disputes and to negligence in maintenance and repair, since no one feels responsible for the craft. There are still problems with the engines — particularly that of overheating — but this is in no way a bottleneck except in Pondicherry. (See *Bay of Bengal News,* No. 27).

The economic viability of BLC has been clearly proven in Pun, where all the boats have shown very good results. The same is valid for Ongole in Andhra Pradesh. Most Andhra Pradesh centres report that cooperatives are repaying loans for the boats at the stipulated rates and that defaulters are very few. Some private entrepreneurs have acquired boats directly from the Kakinada boat-yard — but also from cooperatives which originally received a 50% subsidy on the craft. The private entrepreneur pays an amount somewhere in between the full price and the subsidized price. The entrepreneurs are fishermen or ex-fishermen and hail from local fishing communities. So far, there have been no reports of outsiders investing in BLC. While IND-25 has done very well in Puri, there is a general preference for the IND-20 model, which is more comfortable and suitable for sailing and offshore operations. Although it is difficult to obtain operational data, it is suggested that the monitoring be continued through frequent visits to sites from where BLCs are operating, until the technology is firmly established. It's important for the State Governments to learn about the problems so that remedial actions can be taken as required.

The quality of BLC construction has improved at all the four boatyards that are building the BLC. Periodic inspections and assistance are recommended to maintain the quality.

The trials with water-cooled engines have continued during the year. The 10 hp VST engine has shown itself to be reliable except for the gearbox. Towards the end of year, another engine (Kirloskar) was installed and is undergoing trials. It is suggested that these trials continue during 1988, at the end of which sufficient experience should be available to recommend both or one of these installations. The water-cooled engine would improve the performance of the BLC and reduce the maintenance problems experienced with the air-cooled engine.

Development work on beach-hauling devices has been completed during the year. One beach-hauling winch can service half a dozen boats from the same place. The most economic roller system is logs and planks.

The project has assisted State authorities in Andhra Pradesh and Tamil Nadu during the year to give training to fisheries department staff and fishermen in BLC operations, maintenance and repair; the training has focused on engine maintenance. Further training on these lines seems necessary. But it also seems that profitable utilisation of training on the fisherman's part is more a matter of attitude than learning. Although the impact of training might be a little disappointing it is a necessary element of the introduction of the craft.

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In 1985/86, fishing trials were undertaken from Uppada, Andhra Pradesh, where the technical and economic feasibility of offshore fishing was clearly demonstrated over a 12-month period (BOBP/WP/56). In connection with the technical trials of water-cooled engines from Madras, further offshore fishing trials have been conducted. The results were very positive during a few months in the early part of the year. Thereafter it was so only during a very short period, when large quantities of flying fish were landed. In order to improve the economic performance, experiments have been made by insulating a fish hold and carrying ice on board the IND-20 to presever the fish better. A high priority for the coming year is to undertake further fishing trials to demonstrate the economic viability of the BLC in Tamil Nadu.

22. *Fishing Boat Development in Sri Lanka:* Development and demonstration of new alternative craft to the conventional ones to reduce cost and increase efficiency and comfort of operations. It has three dimensions.

One dimension is to develop an improved boat in the 3.5 to 4t class for multiday offshore fishing. Two craft, SRL-34 (9.75 metre FRP boat) and SRL-15 (9 metre FRP boat) have been completed. SRL-34 is based on the existing design of a Sri Lankan boatyard but with a different general arrangement. SRL-15 is a completely new design and an effort has been made to make the boat a good sailer. Both boats have low-powered engines, 20 and 15 hp respectively.

The work during 1987 has proceeded according to plan, but the progress has been slower than anticipated. SRL-34 was demonstrated and sold on a competitive bidding basis to a fisherman. SRL-15 is busy with demonstrations, and should be ready for sale early 1988. It has not been possible to finalise the documentation required for approval of SRL-34 and SRL-15 under the Ministry of Fisheries subsidy schemes. The work will be terminated around mid-1988 after a full year's monitoring of the performance of SRL-34 and SRL-15.

Late in the year, SRL-34 and SRL-15 made long fishing trips up to 5—6 days, demonstrating their superiority with regard to fuel economy, fish preservation and crew comfort over older craft in the same class. The fishermen cooperating in the trials and demonstrations have fully understood the positive features of these craft. In order to inform a wider audience about this, the possibility of an educational-cum-publicity campaign drawing attention to the features of the new boats will be explored.

Operating such boats requires a shzre organization for maintenance of craft, sale of fish and purchase of fuel and supplies. Owners of the boats may therefore become (or are already) small entrepreneurs who hire fishing crews. Everywhere, however, the fishing crew works on a share basis, a very favourable one at that, since they receive 50% of the net revenue.

The second dimension is the SRL-14 which was developed as a BLC for Sri Lanka. In view of the very limited market for BLC on the west and south coasts of Sri Lanka, the prototype was kept operational pending an opening of the market on the east and northeast coasts.

The SRL-14 was demonstrated in Chilaw, where the retractable propeller propulsion unit of BOBP beachlanding craft is useful when navigating shallow water inlets to the lagoon. After these trials it is believed that the craft might have a future not only from beaches but also from such shallow water bases. If a boatyard in Sri Lanka is interested in promoting this type of craft, it is suggested that the project cooperates with the boatyard to modify the general arrangement and install a different engine of lower cost.

The third dimension is the development and demonstration of improved versions of the outrigger canoes (ORU). Large FRP prototypes constructed earlier by BOBP were not accepted because of the high costs. The second phase of trials with a motorized outrigger canoe SRL-17 for inshore fishing generated some interest among traditional fishermen of Doddanduwa in the south of Sri Lanka. On the basis of this experience it was decided to try a new version of an outrigger canoe.

It was planned to have two outrigger canoe prototypes made during 1987, but construction work was taken up only at the end of the year and is ongoing. In the meantime the previous outrigger canoe (SRL-17) has been sold in Doddanduwa. During 1988, the prototypes will be built, tried **Out** and demonstrated.

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23. *Small-Scale Fishing Technology in Indonesia:* The purpose is to improve existing gear or introduce new fishing gear and methods for the betterment of conditions of fisherfolk in accordance with the general objectives of the project. Specifics are yet to be determined.

A mission composed of a Fishing Technologist and a Naval Architect visited the east coast of North Sumatra in the second half of 1987 to identify a suitable subproject. The mission reported that the fishing effort in the inshore areas is very high, and no definite ideas about improvement of fishing gear in that areas was identified. It seems, though, that offshore fishing could offer development opportunities — particularly for demersal species. In order to explore the potential further, it has been agreed that a masterfisherman will carry out further studies, mainly in the Langkat district, during a 2—3 month period early in 1988. Limited fishing trials may also be undertaken during the study period. It is hoped that this will lead to a concrete subproject and that activities could start in the second half of 1988.

One of the possible conflicts that may emerge during the preparation of a subproject is whether efforts should be devoted to offshore fishing — which would have to be carried out by larger units and probably by more enterprising and better off fishermen — or to the more common small-scale fisherfolk, among whom the result is bound to be less spectacular.

24. *Small-scale fishing technology in Ma/dives:* The general purpose is, as in the case of Indonesia, to improve existing gear, or introduce new fishing gear and methods. Specifics are to be determined.

It has been agreed with the Maldivian authorities that project activities should primarily be considered as supplements to or as follow-up of the ongoing tuna and reef projects funded by FAO and UNDP. The limited staff of the Ministry of Fisheries were fully occupied with these and other projects during 1987. At the very end of the year a few areas of possible support were identified. They relate to transfer of reef fishing technology as a follow-up of the UNDP project; introduction of small sailing outrigger canoes; hauling devices for motorized boats (dhonis) and fish aggregating devices. The BOBP masterfisherman funded under the UNDP project in Maldives was thereafter engaged in field surveys regarding the reef fishing technology. Results were not however available at the time of preparation of this report.

It is hoped that a subproject can be prepared during the first half of 1988, which would encompass one or more of the above areas, and that implementation could start in the second half of 1988.

25. *Motorization of country craft and Improvement of kattumarams in India:* The 11th meeting of the Advisory Committee recommended that the project should take into account the experiences of other projects in the region for motorization of country craft and consider preservation of kattumaram legs, the use of alternative materials and new low cost non-motorized craft as alternatives to the kattumaram in preparing projects for motorization and kattumaram improvement.

With regard to kattumaram improvement, an analysis of previous experience concludes that creating a similar craft, in the same price range, is not possible. Some experiments with alternative materials such as PVC pipes and ferrocement are ongoing in Tamil Nadu but they are far from successful. The PVC solution is becoming too expensive and the ferrocement solution appears to be technically infeasible. If one instead thinks of a somewhat larger craft with higher capacity and better mobility, it would probably have to be motorized and one then reaches the range of the beachianding craft which has already been developed during the earlier phase of BOB P. Other possibilities to assist the fisherfolk operating kattumarams are therefore suggested and a new multi-disciplinary subproject is proposed under Fishery Resources.

In order to learn more about the experiences of motorization of country craft a study was undertaken which looked into all motorization schemes on the east coast of India and in Kerala (See *Bay of Bengal News,* No 28). The conclusion is that outboard motors may appear very suitable for several types of craft in the initial stages of motorization. However, the costs of operation are high including the spare parts; the engines tend to break down frequently. The motorized craft compete with the non-motorized craft for the same resources. While OBM

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motorization undoubtedly leads to technical development, it is doubtful whether it should be encouraged and supported.

Motorization by inboard engines on the other hand appears much more feasible and worth supporting. The craft that can accommodate an inboard engine are usually larger and therefore also have the capacity to tap resources beyond the range now exploited by non-motorized craft. The engines are usually long-living and are cheap to operate since they use diesel as fuel. Simple industrial engines without gearboxes and other sophisticated marine gadgets are also relatively cheap to purchase. Some improvements could be made on the inboard engine installations in various places such as Kakinada and South Tamil Nadu, but they would be of relatively modest nature. In the area of fishing gear and methods, there would probably be more to do. However, since the fisherfolk operating motorized boats have already developed a step further than those operating non-motorized craft, it is felt that priority should be given to the latter. In conclusion it is suggested that motorization of country craft not be taken up as a separate subproject.

26. *The services provided on a reimbursable basis* to the Tuna Fishing projects in Maldives and Sri Lanka and to the Reef Fisheries project in Maldives, were concerned with the specification and fabrication of fishing gear, acquisition of equipment, modifications to the survey vessels and training of counterpart staff. Further supervision, training, evaluation of results and formulation of recommendations will be undertaken during 1988. Assistance to the Ferrocement Boat project in India was terminated during the year. It consisted of advice on specification of equipment, deck layouts and testing of deck machinery on three new ferrocement boats.

BOBP's input of the NORAD-supported project for motorization of dinghies in Orissa, was also terminated during the year. BOBP has for a couple of years been assisting NORAD and the Directorate of Fisheries in Orissa in exploring suitable ways of motorizing the dinghies. After several technical problems, satisfactory solutions were arrived at. During commercial fishing the motorized boats caught about twice as much fish as the non-motorized craft per trip, but the impact of the project is so far negligible. Although the fishermen earned twice as much per trip they made far fewer trips than those operating non-motorized craft and therefore recorded about the same gross earnings. Of four boats, only one produced reasonably satisfactory results. In concluding the trials, the very poor response in the community for this type of motorization was noted. Most people who are interested in more efficient craft wish to have larger boats with higher power which they can use for both trawling and gillnetting. Despite this, it is felt in retrospect that there might be a larger latent interest among some fishermen who have not been reached by the project. At the time of starting this activity motorization seemed very feasible and there was probably some over-optimism in expecting its ready adaptation by the fisherfolk. A better people's participation approach could have led to somewhat better results.

Fishery resources

27. In the wake of UNDP's withdrawal of support to BOBP's work in Fishery Resources Assessment, the Advisory Committee in its 11th meeting recommended that BOBP should retain its competence in the subject. Besides inputs from RAS/118/MUL (4 m/m), this was arranged through some further regional UNDP funding (4 m/m) and reimbursable services (4 m/m) to the Exploratory Tuna Fishing projects in Maldives and Sri Lanka under FAO (TCP) funding and to the Reef Fish Research and Resources Survey project funded by UNDP in Maldives.

The major work under RAS/118/MUL has been identification of the problems of the set bagnet fisheries in Bangladesh and preparation of a new regional project on "bio-economics"; the latter is described under Development Support.

28. *Set bagnet fisheries in Bangladesh:* The Advisory Committee felt that assistance to fisherfolk depending on the behundi fisheries in Bangladesh needs to be preceded by investigations. These could draw on other projects, but a further identification of the problem should be undertaken. A one-month pilot study was thus conducted in Bangladesh at four estuarine locations and one marine location under which both the biological and socio-economic aspects were covered.

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The catch rates in the estuarine areas were very low (3—19 kg/haul) and are lower than those for other gears such as trammel nets and gillnets. The catch rate in the marine sector was 46 kg/haul. Of 8 species of marine shrimps caught in the set bagnet during the survey period, all 8 species were observed in the trawl catches, and 5 species in the trammel net catches. Of 85 species of finfish 24 were found in trawl catches, 34 in gillnet catches and 12 in trammel net catches. The sizes of shrimp and finfish in the set bagnet catches in the estuary were small; 30—90% of the penaeid shrimps and 35—100% of finfish, depending on the species and location, were found to be immature.

Low catch rates and low value for the small size of fish caught result in poor earnings. The fishermen appear to have no asset holdings, no land, no access to other resources and hardly any other employment opportunity. Very little credit facilities are available to them and hardly any welfare organization to help them. This community suffers from poor facilities for transportation, children's schooling and health. Non-fishermen in the community are also poor. Income generating opportunities for women are seen in activities such as tree-farming on government land, poultry and animal keeping, kitchen gardening and fish processing.

All parameters must be quantified for determining the degrees of impact on resources exploited and interaction with other fisheries. Considering the seasonality in spawning and recruitment of various species in different locations, a survey should cover the entire year. More comprehensive surveys of the socio-economic aspects should be carried out including the identification of other employment opportunities.

As already discussed in the 11th AC meeting, further investigations of this fishery could be referred to other projects. However, the future of the national resources project (FAO/UNDP) is uncertain, and it is also not yet certain that the bio-economics project will materialize. Since the fishery is one of the most important ones in Bangladesh and the operators of the fishery belong to the poorest in the country, it is suggested that a one-year study, which might pave the way for action to assist the fisherfolk, be undertaken under RAS/1 18/MUL.

29. *The kattumaram fisherfolk of the east coast of India:* is another prime target group of the project and the fishery on which they depend is very important. A study similar to the one on behundi nets, Bangladesh, is proposed for the kattumaram fisheries also. Such a study would fit well into a work programme of the bio-economics project. But, as in the case of set bagnet fisheries, the study may be undertaken under RAS/118/MUL. It has been included in the proposed work plan for 1988.

30. *Reimbursable activities* have been planning and supervision of the Tuna Fishing projects n Maldives and Sri Lanka and the Reef Fisheries project in Maldives. The Tuna Fishing project in Sri Lanka has completed 9 months of exploratory fishing. The project in Maldives has been delayed due to problems in getting the fishing vessel ready; fishing operations started only at the end of the year. The Reef Fishery project commenced surveys in September and is scheduled to continue for a full year. Both the Tuna Fishing projects have been rescheduled to continue till the end of 1988. (Some further details about the projects are available in document AC1 2/7).

During the first 4 months of the year the Fishery Resources component was funded by a FAO/UNDP Regional project (RAS/86/026) under the IPTP. This arrangement was made to allow a proper completion of the earlier resource management work under RAS/81 /051. The outstanding work at the end of 1986 was training of counterparts in the use of micro-computers for research statistics and stock assessment. A two-week training course was thus conducted in February. Besides, many reports on RAS/81 /051 work were to be completed during the first months of 1987, (e.g. BOBP/REP/39 and 40, BOBP/MAG/4 and 5).

Development support

31. Development Support activities attempt to further the utilization of the results of BOBP's work and in general to promote small-scale fisheries development. The major work item recommended for 1 987 was to maintain an overview of the needs for fisheries development in the region and to identify and prepare projects to fulfil these needs — with particular attention to the preparation of a new regional "bio-economics" project.

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Another continuing activity is the preparation and promotion of projects as follow up or expansion of BOBP work.

Thirdly, the work on motorization of Chandi boats (10) in Bangladesh, earlier referred to under Fishing Technology, has been transferred to Development Support since it is essentially a promotional activity without technical input.

32. *Needs for fisheries development:* An attempt has been made to review fisheries plans and current development issues in Bangladesh, India and Sri Lanka. It was also started in Thailand. A summary of the outcome is presented in a separate document. The review in India was done by State (West Bengal, Orissa, Andhra Pradesh and Tamil Nadu and the union territory of Andaman and Nicobar Islands). Separate working documents were prepared for each state and later combined into one document for India. At the same time a list of externally supported projects in the BOBP countries has been prepared.

The major problem during the reviewing work has been the conflict between the relevance, the accuracy and the detail which such reviews need on the one hand, and the input needed to meet those requirements on the other. The problem may be illustrated by a sector study being undertaken in Sri Lanka. It is funded by the Asian Development Bank and conducted by FAO. The cost of the study is about US $ 350,000 and the inputs come from more than a dozen international and national consultants. The Sri Lanka situation is not unique; such studies are undertaken by the ADB, the World Bank and sometimes by other agencies in other countries **also from time to time. It is doubtful whether BOBP's limited resources should be devoted to** such work.

It is therefore suggested that BOBP, rather than looking at the overall needs, concentrates on specific areas related to small-scale fisheries and prepares project proposals in these areas or undertakes specific studies. The needs for development could be presented at the meetings of the Bay of Bengal Committee (BOBC) every second year by the countries themselves as often done in the past in regional FAO bodies.

Updating of the list of externally supported projects could be undertaken by BOBP's Information Service or by the BOBC Secretariat on a regular basis and presented at the annual meetings of BOBC and/or the AC and be made available on request.

33. *A project proposal on "bio-economics for small-scale fisheries in the Bay of Bengal"* was prepared on the recommendation of the Advisory Committee. The draft was discussed with FAO HQs specialists and eventually submitted to the member governments for comments and endorsement. The immediate objectives would be to introduce methodologies for assessment **of bio-economics and socio-economics of particular fisheries situations; assessment of the** potential use of fish aggregating devices including artificial reefs; and identification of potential for exploring underutilized and unutilized resources accessible by the small-scale sector. A novel element in the project is people's participation in gathering of data and information and in the monitoring and utilization of the resources. It is hoped that the project could start mid-i 988 for a duration of 3.5 years at a cost of US $1.5 million.

34. *Preparation and promotion of projects:* In the beginning of 1987 there were four proposals in the pipeline, based on earlier BOBP work:

Non-formal Adult Education for Fisherfolk in Tamil Nadu

Non-formal Primary Education for Fisherfolk Children in Orissa

Training of Women Link Workers in Tamil Nadu

Bank Services for Artisanal Coastal Fisherfolk in India.

Funding support for the first three projects is likely from DANIDA, NORAD and ODA respectively. The proposals are still being processed by the machineries of State Governments and the Central Government in India. The fourth project was prepared more or less on request from the Dutch Agency, but it transpires that the Agency's interest in the project has since waned.

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During the year the following proposals have been prepared:

Non-formal Primary Education in Andhra Pradesh (Endorsed by the Andhra Pradesh Government and submitted to GOI).

Demonstration of Offshore Small-Scale Pelagic Fishing in India, (ODA has expressed interest in supporting it).

Motorization of Chandi Boats (50) in Bangladesh (DAN IDA has expressed interest).

Introduction of Driftnetting for Tuna in Indonesia. (Prepared with FAO/TCP support in mind).

Liaison with the governments and donor agencies concerned will continue during 1988 with regard to above projects in order to reach conclusive decisions before the end of the year. At the same time, new projects will be prepared during the year as ideas are generated or as requested.

35. *Motorization of Chandi boats:* The purpose is to introduce motorized craft to increase the incomes of small-scale fishermen. As far back as 1981, BOBP demonstrated the technical and economic viability of motorizing the Chandi boats, usually fishing for hilsa, by diesel engines of the longtail type. A follow-up project was prepared on request from UNCDF which however never materialised because of problems with institutional arrangements.

A new proposal was prepared for motorization of 50 boats under the umbrella of BOBP but with separate funding from a bilateral agency. This was submitted to various agencies in the beginning of 1987. In the meantime it was decided to issue 10 more engines in order to further promote the idea and demonstrate the viability. During the year therefore 10 new engines of Japanese manufacture but locally available in Bangladesh were acquired and made ready for delivery. The issue has been delayed pending the selection of beneficiaries—which will be done by a committee consisting of representatives of the communities DOF, Krishi Bank and the BOB P. Th3 engines will be issued on credit and the loans will be recovered by BOB P. The idea is to demonstrate to banks and other concerned parties the possibility of a credit scheme which would reach fishermen not able to mobilize the means required for the motorization themselves. It is hoped that the engines can be issued early 1988; the future work would thereafter only consist of monitoring of data and collection of instalments.

36. *Non-formal Primary Education for Fisherfolk Children in Orissa:* It is very likely, as mentioned above, that NORAD will support a project to reinforce and expand BOBP's work in non-formal primary education. It was earlier hoped that the new project would start in 1987. Because of lack of new support and BOB P's withdrawal at the end of 1986, the existing centres have had serious problems with funds and supervision and the education provided has deteriorated in quality. In order to bring it up to standard again and maintain it until the new project becomes operational, financial support is suggested as a bridging excercise till end 1988 or until a decision about the NORAD support — whichever comes first.

Information Service

37. Major effort during the year was expended in clearing the backlog of *technical reports* left over from GCP/RAS/040/SWE and RAS/81/51. (Costs of production were covered by those projects through advance charges before they were terminated). Sixteen papers were brought out during the year (Table 2) and about half a dozen remain; these will be cleared in the first half of 1988. The preparation of reports of quality is a time-consuming job. Technical and language editing take time, so does the conquest of printing hassles. BOBP's output of technical papers to date — about 11 5 in all — is substantive, and enormous effort has gone into them. The good response to these papers is a matter for satisfaction. For further improvement the technical staff will be encouraged to document their work more promptly than was done in the past during long periods of heavy workload. Discussion is also on about establishing a link between the project computer and computers in the printing press. This will cut composing time and reading time as well.

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The newsletter, *Bay of Bengal News,* is an unqualified success. Surprisingly enough, even technical specialists seem to prefer newsletter articles to technical reports to keep abreast of BOBP work. During the year under review, the size of the newsletter was kept down to 16 pages (except for the 24-page December 1987 issue) in view of the priority given to report production. In 1988, however, *Bay of Bengal News* should be bigger and better: the technical staff will discuss their opinions and their activities regularly through newsletter articles.

38. One *audio-visual* was produced during the year, another was under preparation. Audio-visuals are unmatched for dramatic impact. No new video films were taken up during the year, but several requests for old ones were met. The project will tap this medium more systematically in future. It would also welcome exchange arrangements for video tapes — similar to exchange of journals — with other fisheries development organizations.

Preliminary discussions have been held with IMO about cooperation in the production of a video film on "Reducing Oil Pollution in the Visakhapatnam Fishery Harbour" which might need further attention in 1988.

A portable photo display system has been acquired for use at conferences and seminars. The photo collection is to be updated and strengthened in the coming year. A start was made late in 1987 with help from RAPA's Information Officer who visited Maldives and Sri Lanka.

39. The project continues to receive a good press. (The consultation on "people's participation" in fisheries development projects is an example). Tile effort has been to encourage restrained and well-informed reporting of project work, and to discourage glowing success-stories of "revolutions" or "breakthroughs". Both accuracy and realisms are casualties when a project is too aggressive in its approach to newspaper publicity.

The project cooperated with the National Swedish Board of Fisheries in an exhibition in Sweden on BOBP's work. On display were photographs, sketches and models made by Signar Bengtson. The idea is that the exhibitions will be on at several centres in Sweden and perhaps Denmark and Norway.

The 1987 fisheries calendar was a hit, and a similar desk calendar, with sketches of small-scale fisheries by two staff artists, has been brought out for 1988.

There is an urgent need for quick-to-read general information on BOBP. It is hoped to meet this need by producing a pictorial brochure in 1988.

40. The project library continued to render reference services to fisheries professionals within and outside the project. A microfiche reader has been obtained, and future book acquisitions are likely to be often in microfiche.

Last but not the least, various activities — such as information dissemination, media servicing and visitor briefing — claim a fair share of the time of the Information Service.

Expenditures

41. The estimated total expenditures during 1987 are US $ 1.04 million against a budget of $1.4 million in the original project document. The "savings" during the year are not forfeited but can be used in the next or following years of the project's lifetime. The original budget amount was already reduced after the 11th AC meeting to $1.31 million and the actual under-delivery in monetary terms during the year therefore amounts to $ 270,000. The main reasons for this are the vacant post in Socio-Economics, the partly vacant posts for Extension Training Officer and Development Adviser and delays in ordering and delivery of equipment including vehicles. A breakdown of the expenditures as per FAO accounting codes is given in Table 3.

The workplan for 1988 envisages an expenditure of about US $1.76 million (Table 3) which is about the maximum amount available for 1988 from DANIDA, SIDA and the member governments.

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The preliminary distribution of actual expenditures by major disciplines in 1987 and the estimates for 1988 are given below (in %).

	1987	1988
Extension	24	36
Brackishwater Culture	25	23
Fishing Technology	23	20
Fishery Resources	6	9
Development Support	5	5
Information Service	17	7

The primarily technical disciplines of Brackishwater Culture and Fishing Technology also include elements of extension such as socio-economic studies at preparatory stages and people's participation at implementation stages.

42. Of the core staff posts listed in the project document the one for Socio-Economist (SE) has been vacant the whole year. The Development Adviser post (DA) has also been vacant but consultants have been engaged to perform the essential duties. The Extension Training(ET) post was filled by a consultant for seven months of the year. Other posts have been filled (Table 4).

Upon finalization of the work plan after the 11th AC meeting it was felt that better mileage could be attained from the SE post by utilizing the funds to hire national consultants. Since this post had been earmarked for a female incumbent and it was felt necessary to have one female staff member the DA post should ideally be filled by such a candidate. FAO has offered the post to a few candidates but with negative response. It is only at the very end of the year that a positive response was received from a suitable candidate.

43. Four Associate Professional Officers (APO) inherited from RAS/040/SWE left the project in the first half of 1987 upon termination of their contracts. Two new APOs, Sociologist (Canada) and Economist (Switzerland) joined in the 3rd quarter (Table 4). Eight more APOs (four each from Netherlands and Sweden) are expected to join in the first quarter of 1988. They are in the areas of Socio-Economics (2), Aquaculture, People's Participation, Training, Fishing Technology, Marine Engineering and Economics.

44. The supporting staff employed at the end of 1987 are listed in Table 5. Support services are being provided to the ODA project on a reimbursable basis. With considerable increase of professional staff during 1988 it will be necessary to engage some additional support staff in Madras (secretaries and drivers).

45. Almost all professional staff undertake frequent duty travel which is an essential element of a regional project. During the year the average number of travel days was 98 and it varied from 64 to 139. The APOs receive their own travel allowances from their respective governments. The amounts vary, from $ 3,000 to $ 6,000 per year depending on their country, but cover about 50% of their total travel cost.

46. Expenditures under contractual services are being incurred for national consultants, other temporary staff and labour, studies, construction work (of boats for instance), printing, etc. The actual expenditures incurred are about proportionate to the total expenditures under the respective disciplines.

47. The operating expenditures cover fuel, maintenance and repair of vehicles and other equipment, postage, telephones, etc. Most of them are incurred by the Administration and the Information Service.

48. Of the expenditures for supplies and materials about 50% are accounted for under Brackish-water Culture and mainly cover costs of seed, and feed. Other heavy items are stationery, fishing gear and information materials.

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49. The major equipment components acquired during the year are office machines, vehicles in Bangladesh, Indonesia and Thailand, longtail engines in Bangladesh and camera and display equipment for the Information Service.

50. Being a new project with most of the work of preparatory nature the costs of training have not been very high. Most of it (nearly 50%) refer to the PEP consultation. The other major training activities have taken place in connection with the extension subprojects in Indonesia and Thailand. Details are in Table 6. Costs of travel to the Advisory Committee meeting and field allowances for counterpart staff are also included under the training code.

Table 1

GCP/RAS/118/MUL—Targets of proposed workplan for 1988

1. *Extension*

1.1 General (GEN)	— Identification/preparation of a subproject in Maldives. — Support to establish a network of NGOs associated with fisherlolk development in Sri Lanka for effective liaison with Govt. authorities and donor agencies. — Development and testing of methods, techniques and strategies for PEP and in particular a working manual on PEP in project planning and project implementation for small-scale fisheries using Rapid Rural Assessment methods. — Small-scale marine fisherfolk consultation in Tamil Nadu to exchange views and learn of fisherfolk needs' perceptions, and aspirations - a pilot activity. — Support to other subprojects in general and in particular to: — Set bagnet fisheries in Bangladesh (RES/SBN/BGD) — Kattumaram fisheries in India (RES/KAT/IND) – Prawn seed collection in Bangladesh (BWC/PSC/BG D)
1.2 Credit to Marine Small-Scale Fisherfolk, Sri Lanka (FFC/SRL)	—Studies — Inventory/census of fishing and fisheries related economic activities. —Market constraints analysis —Scope of rural credit and savings clubs in fishing villages. —Cost/earnings analysis of economic activities of fisherfolk and assessment of credit needs and of deposit potential. —Training of bank staff, MOF field staff and women NGO staff to undertake the studies.
1.3 Fisherfolk Radio, Sri Lanka (RDO/SRL)	—Audience profile studies of fisherfolk communities to determine their needs and interests, optimal programming times and durations, preferences in program content and presentation and willingness of fisherfolk to participate in programming.

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	— Development of programming strategy in terms of scheduling, content, presentation modes, production back-up.
	—Training Minfish/SLBC staff in production/broadcasting.
	— Development of market/catch news network of informants in fisherfolk communities.
	—Arrangements to acquire local-specific timely weather forecasts.
	— Production of sample programmes and field test using recording/play back equipment.
1.4 Extension Support through NGOs, India (NGO/IND)	—With selected NGOs, identification of specific training needs in technical and extension areas and technology transfer needs. — Start of training and demonstration activities.
1.5 Fisheries Extension Development, Bangladesh (FED/BGD)	—Training of DOF and NGO staff in Rapid Rural Assessment and participatory development approaches. — Field study of fisherfolk communities by Extension staff and NGOs to understand needs and priorities of fisherfolk communities and community dynamics. — Identification of development opportunities and design and planning of inputs with active community participation.
1.6 Extension Service for Small-Scale Fisheries in Ranong, Thailand (ESR/THA)	—Analysis of costs and earnings and credit needs; formulation and initiation of loan schemes as appropriate. —Analysis of village survey data; identification and initiation of group activities among men and women with help of CD officers. — Further training and demonstration of crab traps in two batches of fishermen. — Collection of oyster spats and start of culture. — Demonstration and trials of crab fattening. — Demonstration and trials of squid traps. — Evaluation of cage culture potential and start of trials if appropriate. — Evaluation of progress and direction of the subproject.
1.7 Improved Earnings for Small-Scale Coastal Fisherfolk, Indonesia (IEF/INS)	— Collection of basic data on fisherfolk communities, on economic activities of fisherfolk and understanding of community dynamics. — Collection of detailed data on economics of remunerative activities among fisherfolk. — Preparation of credit scheme. — Preparation of other activities identified during field enquiries

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— Initiation of credit and other project activities.

2. Brackishwater Culture (BWC)

2.1 General (GEN)

—Technical assessment of *Artemia* culture potential in Tamil Nadu and Andhra Pradesh salterns;

—A workshop to discuss the technical and socio-economic aspects of *Artemia* culture in India.

— Preparation of a project proposal for Artemia.

—A report to SIDA with recommendations for further action on silvipisciculture based on the results of engineering and socio-economic studies.

— Establish a mechanism through which BOBP can continue to provide inputs to the silvipisciculture project in West Bengal to improve fish productivity and promote people's participation in the management and benefits of the project

2.2 Pen culture of Prawns in Sri Lanka (PEN/SRL)

— Completion of 9 months of trials based on a partial harvest/restocking procedure;
— Construction and operation by SDO nominees of two new 0.25 ha pens;

— If preliminary results are satisfactory, identification of interested persons in the local and surrounding communities and their training in pen culture technology;

— Evaluation of economic potential

— Evaluation of training, demonstration and credit needs for extension.

2.3 Seaweed (Gracilaria) Farming, Sri Lanka (SWD/SRL)

— Construction of pilot farms and applied research installations including spore setting facilities and farm modules.
—Training of national staff in spore setting and outplanting technology.

— One commercial harvest of seaweed.

Start of applied research activities in Gracilaria culture.

— A study tour to Thailand for national staff.

— Initial surveys of wild stocks of commercially valuable seaweeds.

—An export market study—to be undertaken by the ODA Post-Harvest Fisheries project.

2.4 Seaweed (Gracilaria) Farming, Tamil Nadu, India (SWD/IND)

— Continued development and reinforcement of people's participation in technical trials and evaluation through the seaweed farmer's committees.

— Complete seeding of the pilot farms by the end of March.

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	— **Start of partial harvesting by the second** quarter.
	— **Improved skills of TNFD staff through a study tour to** Thailand and on-the-job experience.
	— Study of post harvest processing and marketing — to be undertaken by **the ODA Post Harvest Fisheries** project.
2.5 Brackishwater Culture, West Bengal	— Identification, preparation and start of a subproject. — It is hoped that the concept of silvipisciculture or some other ecologically sustainable culture system can be introduced to low income -villagers in the coastal zone.
2.6 Prawn Seed Collection in Bangladesh **(PSC, BGD)**	—Assessment of technical problems faced by seed catchers and of possible improvements. — Detailed design of technical remedies and start of trials of improved technology for seed catching and handling. — Selection of an NGO for implementation and technical training of its staff. — Selection of two or three villages in each of the three districts for participation in pilot project activities. — Identfication of other suitable measures to improve the socio-economic conditions of the seed catchers.
2.7 Oyster Culture Development, Malaysia **(OYS/MAL)**	— Training of field biologists in cultch fabrication, spatfall monitoring, estimation of spawning periods and collection of basic environmental data — An oyster marketing study. — Spat collection at Sungai Muar, S. Linggi, Pulau Pangkor, P. Jerejak and P. Langkawi with participation of local fisherfolk. —AstudytourtoThailandfor FRI staff.
3. *Fishing Technology (FIT)*	
3.1 General (GEN)	— Start of sail power demonstration programme for small fishing craft in India and Sri Lanka if and when the services of an APO sail specialist are obtained. — Support (reimbursable) to other projects Exploratory Tuna Fishing, Sri Lanka (FAO/TCP) Exporatory Tuna Fishing, Maldives (FAO/TCP) Reef Fisheries Survey, Maldives (FAO/UNDP) Fisheries Sector Study, Sri Lanka (FAO/ADB)
3.2 Small-scale Fishing Technology, Maldives	— Preparation and start of a subproject
3.3 Fishing Boat Development, Sri Lanka **(FBD/SRL)**	*Completion of one year of performance monitoring of SRL—15 and SRL—34. —Approval of SRL—15 and SRL—34 for subsidy schemes. —Technical support in construction of the final version of SRL—15 and SRL—34.

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	— Propaganda campaign for low fuel consumption, fish preservation, safety, comfort and other features of the new boats.
	- Final report on development of small multi-day offshore craft.
	— Demonstration of SRL—14 for operations from shallow water inlets.
	— Modification of SRL—14 general arrangement and re-engining in cooperation with private boatyard.
	— Construction of two outrigger canoes (SRL—18) and trials and demonstration of the same in collaboration with local fishermen of Doddanduwa.
	Technical and economic evaluation of the performance of the outrigger canoes.
	— Reporting on development of outrigger canoes.
3.4 Beachlanding Craft Introduction, India (BCI, IND)	— Maintenance of the quality of construction of BLC.
	— Further trials of differentially fresh water cooled Kirloskar diesel engine and VST reduction gear box till their feasibility is established.
	—Training of trainers and fishermen in BLC engine operation and maintenance.
	— Conduct of experimental fishing trials to demonstrate economic viability of BLC in Tamil Nadu.
	— Monitoring of performance.
3.5 Small-Scale Fishing Technology in Indonesia	—A detailed study of small-scale fishing operations in Langkat district which may include experimental fishing trials.
	— Preparation and commencement of a subproject.
4. Fishery Resources (RES)	
4,1 General (GEN)	*Support (reimbursable) to other projects.
	— Exploratory Tuna Fishing, Maldives (FAO/TCP).
	— Exploratory Tuna Fishing, Sri Lanka (FAO/TCP).
	— Reef fisheries survey, Maldives (FAO/UNDP).
	— Fisheries Sector Study, Sri Lanka (FAO/ADB).
4.2 Kattumaram Fisheries, India (KAT/IND)	—Conduct field survey of the biological, technological, socio-economic and marketing aspects* of the Kattumaram fisheries (eventually over a full one-year period) at one centre each in Orissa, Andhra Pradesh and Tamil Nadu.
	— During the course of the survey conduct of experiments with fishing gear, marketing, education (non-formal) and training if found appropriate.

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*Marketjng aspects will be covered by the ODA project.

4.3 Set Bagnet Fisheries, Bangladesh

(SBN/BGD)

— Intensive sampling of the set bagnet fisheries in the estuarine sector (eventually through all seasons).

— Determine the socio-economic factors influencing the fisherfolk engaged in the fisheries and identifying supplementary or alternate means of improving their income and living conditions.

5. *Development Support (DEV)*

5.1 General (GEN)

— Liaison with Government authorities and donor agencies to reach conclusive decisions on pipeline proposals.

— Evaluation of terminated subprojects such as the Pen Culture project in Killai and Credit project in Orissa.

— Identification and preparation of project proposals in West Bengal.

— Investigation of possibilities to make use of technology! products/methodology/resource of one country in another country (TDC) and if appropriate arrange a regional consultation on the same.

5.2 Non-formal Primary Education in Orissa (DEV/EOR)

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

5.3. Motorization of Chandi Boats in Bhola, Bangladesh (DEV/MCB)

Installation of engines, technical support, monitoring the fishing activity and collection of instalments.

6. *Information Service (INF)*

6.1 General (GEN)

—About a dozen technical reports (including about half a dozen left over from RAS/81 /051).

— Four issues of *Bay of Bengal News.*

—Two audio-visuals and two video programmes

- Brochures on BOBP

— Desk calendar

— Strengthening photo collection

— Media servicing and information support to project activities.

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Table 2

BOBP Publications—1987

Reports

BOBP/REP/32	Bank Credit for Artisanal Fisherfolk of Orissa, India. U. Tietze. Madras, India, May 1987.
BOBP/REP/33	Non-formal Education for Children of Marine Fisherfolk in Orissa, India. U. Tietze, Namita Ray Madras, India, December 1987.
BOBP/REP/35	Brackishwater Shrimp Culture Demonstration in Bangladesh. M. Karim, Madras, India, January 1987.
BOBP/REP/36	Hilsa Investigations in Bangladesh. Colombo, Sri Lanka, June 1987.
BOBP/REP/37	High-opening Bottom Trawling in Tamil Nadu, Gujarat and Orissa, India; A Summary of Effort and Impact. Madras, India, February 1987.
BOBP/REP/38	Report of the Eleventh Meeting of the Advisory Committee. Bangkok, Thailand, March 26—29,1987. Madras, India, June 1987.
BOBP/REP/39	Investigations of the Scad and Mackerel Resources of the Malacca Straits. Madras, India, December 1987.
BOBP/REP/40	Tuna in the Andaman Sea. Madras, India, December 1987.

Working Papers

BOBP/WP/49	Pen Culture of Shrimp by Fisherfolk: The BOBP Experience in Killai, Tamil Nadu, India. E. Drewes, G. Rajappan. Madras, India, April 1987.
BOBP/WP/52	Experimental Culture of Seaweeds (Gracilaria Sp.) in Penang, Malaysia. (Based on a report by Maxwell Doty and Jack Fisher). Madras, India, August 1987.
BOBP/WP/54	Experiences with Fish Aggregating Devices in Sri Lanka. K. T. Weerasooriya. Madras, India, January 1987.
BOBP/WP/55	Study on Income, Indebtedness and Savings among Fisherfolk of Orissa, India. T. Mammo. Madras, India, December 1987.
BOBP/WP/56	Fishing Trials with Beachlanding Craft at Uppada, Andhra Pradesh, India. L. Nyberg. Madras, India, June 1987.
BOBP/WP/57	Identifying Extension Activities for Fisherwomen in Visakhapatnam District, Andhra Pradesh, India. Diana Templeman. Madras, India, August 1987.

Manuals and Guides

BOBP/MAG/4	Separating Mixtures of Normal Distributions: Basic Programs for Bhattacharya's Method and Their Applications to Fish Population Analysis. H. Goonetilleke, K. Sivasubramaniam. Madras, India, November 1987.
BOBP/MAG/5	Bay of Bengal Fisheries Information System (BOBFINS): User's Manual. Madras, India, September 1987.

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Newsletters (Bay of Bengal News):

March 1987, June 1987, September 1987, December 1987.

Table 3

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

Code	Object of Expenditure	Original Budget in Project Document 1987	Revised Budget after 11th AC Meeting 1987	Estimated Expenditure 1987 (1)	Preliminary Budget 1988	Estimated Balance 1989-91 (3)
10	Personnel Services					
	Professional Staff	558,000	462,000	320,000	550,000	
	Supporting staff	90,000	95,000	105,000	120,000	
20	Duty Travel	120,000	115,000	100,000	140,000	
30	Contractual services	100,000	134,000	125,000	220,000	
40	Operating Expenses	90,000	78,000	80,000	90,000	
50	Supplies & Materials	100,000	86,500	65,000	100,000	
60	Equipment	65,000	119,000	60,000	170,000	
80	Training	115,000	74,000	65,000	170,000	
	Sub Total	1,238,000	1,163,500	920,000	1,560,000	
90	Servicing costs	160,940	151,255	120,000	200,000	
	Grand Total	1,398,940	1,314,755	1,040,000	1,760,000	5,700,000

1. Based on actual expenditures upto 30-10-1987.
2. Rough estimate based on work plan outlined in Table 1.
3. Assuming total contribution of US$ 4 million each from DAN IDA and SIDA and $0.5 million from member countries.

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Table 4

GCP/RAS/118/MUL — International Staff—1987

Post	Name of incumbent (Nationality)	Date of (month/year) Arr.	* Dep.
Core staff			
1. Programme Director	Engvall, L. O. (Sweden)	11/78	
2. Sr. Aquaculturist	Angell, C (USA)	09/86	
3. Sr. Fishing Technologist	Pajot, G. (France)	10/83	
4. Sr. Fishery Biologist	Sivasubramaniam, K. (Sri Lanka)	05/87	
5. Information Officer	Madhu, S. R. (India)	10/79	
6. Aquaculturist (Ass. Prof. Officer)	Funegaard, P. B. G. (Sweden)	03/85	03/87
7. Economist (Ass. Prof. Officer)	Gillgren, B. C. (Sweden)	07/85	07/87
8. Economist (Ass. Prof. Officer)	Luginbuhl, N. (Switzerland)	09/87	
9. Socio-Economist (Ass. Prof. Officer)	Mammo, T (Sweden)	08/85	08/87
10. Fishing Technologist (Ass. Prof. Officer)	Nyberg, L. (Sweden)	10/85	03/87
11. Aquaculturist (Ass. Prof. Officer)	Reyntjens, D (Belgium)	08/85	
12. Sociologist (Ass. Prof. Officer)	Townsley, P. G. (Canada)	08/87	
Consultants		Man/months	
1. People's participation in fishery resource management	Aguero, M. (Chile)		
2. Extension activities, Indonesia	Drewes, E (Germany FR)	1.5	
3. Extension activities, Indonesia	Kiat, T. C. (Malaysia)	1.5	
4. Extension training	Roy, R. N. (India)	7	
5. Credits, Sri Lanka	Tietze, U. (FAO)		

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6.	Fishing boat design and construction, Sri Lanka	Gulbrandsen, O. (Norway)	3.5
7.	Naval architect	Ravikumar, R. (India)	5
8.	Aquaculture engineering in West Bengal, India	Muir, J. F. (FAO)	0.5
9.	Development plans and issues	Gillgren, B. C. (Sweden)	2
10.	Development support	Raja, A. (India)	2
11.	Information service	Bengtson, S. (Sweden)	1

Table 5

GCP/RAS/118/MUL – Supporting staff —31-12-87

ManaçJement and Administration (Madras)	
Scurville (Ms) S.	Sr. Admin Assistant/Secretary
Rajagopal, K.	Admin Assistant (Accounts)
Abraham (Ms) I.	Typist
Shanmugham, T. P.	Sr. Driver
Sivashanmugham, P. M.	Sr. Driver
Farrar, R.	Messenger
Information Service (Madras)	
Bhavani (Ms) V.	Documentalist
Amalore, E.	Artist/Draughtsman
Jayaraj, S.	Artist
Gordon (Ms) P.	Secretary
Secretarial Service (Madras)	
Baptist (Ms) J.	Secretary
D'Costa (Ms) G.	Secretary
Paul (Ms) M.	Secretary
Yourey (Ms) K.	Secretary
National Office (Dhaka)	
Kashem A.	Programme Officer
Syed, Nural H. I.	Typist
Kakir, A. Q.	Driver
National Office (Colombo)	
Joseph, L.	Programme Officer
Kelaart (Ms) C.	Secretary
Premaratne, A. D.	Driver

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Table 6

GCP/RAS/118/MUL – Training Activities – 1987

Subject	Duration days	Venue	Number of Participants						
			MDV	SRL	IND	BGD	THA	MAL	INS
1. Consultations/Seminars/Workshops									
1.1 People's Participation and perceptions of fisherfolk problems for NGOs	3	Colombo	–	32	-	-	-	-	-
1.2 People's Participation in Small-Scale Fisheries Development	5	Bangalore	1	4	23	2	4	1	1
1.3 Workshop on Savings	1	Balasore Orissa	—	—	27	-	-	-	-
2. Training Courses									
2.1 Extension orientation for staff involved in the sub-project	3	Ranong Thailand	–	–	–	–	22	-	-
2.2 Extension orientation in fisheries matters for CDOs	3	Ranong Thailand		–	–	–	22	-	-
2.3 Construction of new type of crab trap for fishermen	4	Ranong Thailand	–	–	–	–	14	-	-
2.4 Manufacture and utilization of new traps for fishermen by CDO	2	Ranong Thailand	–	–	–	–	31	-	-
2.5 Orientation about small-scale fisheries and BOBP's approach for staff of general extension service, bank and women's organisation	4	Medan Indonesia	–	–	–	–	–	–	30

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	Subject	Duration (days)	Venue	Number of Participants						
				MDV	SRL	IND	BGD	THA	MAL	INS
2.6	Preparation of field enquiries for staff of PFS Banks, PPL and PKK	4	Stabat Langkat Indonesia	—	—	-	-	-	-	30
2.7	Orientation in participatory research & planning of prawn seed collection for UBINIG staff	2	Dhaka	—	—	—	11	-	-	-
2.8	Orientation in participatory research & planning of Set Bagnet Fisheries for CODEC staff	2	Chittagong	-	-	-	3	—	-	-
2.9	Orientation in participatory research and planning of seaweed culture trials for field investigators	'10	Madras	—	—	3	—	-	-	-
2.10	Basics of oyster culture for potential farmers	3	Surat Thani	—	—	—	—	28	-	-
2.11	Manufacture & use of crab traps	2	Ranong	—	—	—	—	21	-	-
3.	Study Tours									
3.1	Observation of oyster culture for oyster farmers	2	Surat Thani	—	—	—	—	35	-	-
3.2	Observation of BOBP extension activities by team from Thailand	10	Sri Lanka Orissa Tamil Nadu	—	—	—	—	3	-	-
3.3	BLC operations and maintenance for Pondicherry fishermen	10	Andhra Pradesh & Orissa	—	—	8	-	-	-	-

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Appendix E

ODA POST-HARVEST FISHERIES PROJECT: Summary and Work Programme Proposals

1. This paper summarises the objectives of the British-funded and executed Post-Harvest Fisheries Project, and the initial activities since its commencement in August up to December 1987. The proposed future work programme is outlined.

2. The project, initially funded for two years, aims to improve handling and marketing of fish in the BOBP region where it is believed that post-harvest losses and under-utilisation are already presenting substantial problems. The specific objectives of the project are to reduce such post-harvest losses which occur through lack of training, poor techniques, inadequate handling facilities and equipment; also to optimise utilisation and increase the value added to fish and fish products.

3. Implementation is primarily by the Adviser identifying specific activities in which the application of known or adapted technology will be of benefit in reducing post-harvest losses and/or optimising utilisation. Activities may take the form of pilot plant evaluation, adaptive research and development programmes, feasibility studies, training courses, workshops and other forms of technology transfer. It is envisaged that the project will bridge the gap between the work of the research institutes and actual practice at landings and processing sites throughout the region. The Adviser will plan, organise, evaluate these activities, and participate in them as appropriate. The emphasis of the project is directed towards field work in the small-scale fisheries sector but this will not preclude involvement, where appropriate, with large-scale echnology. Technical support will be in the form of national and international short-terms consultants, and counterpart staff brought in for specific purposes.

4. The project will operate in a similar manner to the FAO Small-Scale Fisherfolk Communities Project (GCP/RAS/1 18/MUL) in that it will identify situations where a particular problem is acute and demonstrate a solution to that constraint. If the solution is effective it will be taken up and promoted in other fisheries throughout the region. Thus the project will act as a catalyst for developmental activities. A great deal of flexibility has been built into the project to enable it to respond to the needs of different countries in the region and also to the various fishing communities within those countries.

5. In India, the Adviser surveyed several fish landings in Tamil Nadu and also Cochin in Kerala. A visit was made to Indonesia to hold preliminary meetings with government officials to discuss the needs of the fisheries sector and identify areas where the ODA project could assist post-harvest technology in Sumatra.

6. Two draft proposals concerning prawn feed manufacture and seaweed marketing/processing have been prepared. Outline details are at Appendices 1 and 2.

7. The Adviser will visit Thailand in January 1988 and Bangladesh, Malaysia, Maldives and Sri Lanka during the first half of the year for purposes of liaison and project identification.

8. A great deal of useful information was contained in the country statements on post-harvest technology presented at the BOBC meeting in Bangkok, March 1987. Major topics of concern are the utilisation of trawl by-catch and the deterioration of quality fish on-board vessels during sorting and handling prior to landing. There is also interest in the region for improving the handling after harvest of both farmed and wild prawns. Project proposals will be formulated in '1988 to address these problems.

9. Whilst there are many other areas of post-harvest technology which undoubtedly warrant attention it would be speculative at this early stage in the project to state which will receive -attention during 1988. Much will depend on the findings of the project identification visits and

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on the priorities given to them by the respective Departments of Fisheries. Each member country has been requested to nominate a Post-Harvest Coordination Officer.

10. In order to achieve any lasting change in post-harvest practices it is necessary to ensure that there is suffcient financial incentive for either the fishermen, the processors or the traders. The finance is provided by the consumer or user and hence it will be necessary to conduct various socio-economic studies to ensure that envisaged changes in post-harvest technology meet the real needs of the market. Several small-scale marketing studies are planned for the east coast of India during 1988.

11. A useful approach to common areas of major concern could be to have single-topic regional consultations or workshops attended by representatives of the countries involved.

12. Training courses will ideally be of the "hands-on" type at appropriate in-country centres where trainees can undertake industrial or semi-industrial pilot-plant scale processing.

13. Other regional ODA post-harvest fisheries activities which are not part of this project are summarised in Appendix 3.

14. The committee is invited to comment on the work of the project and on the proposed outline work programme.

Appendix 1

Project Management Plan: Improved utilisation of waste and low-value fish in India (ODA/P1/IND)

Terms of reference:

1. Determine present and future market demand for manufactured prawn feed, quantify level of imports, and ascertain commercial feasibility of import substitution by domestic production.
2. Determine seasonal availability and technical suitability of presently wasted or under-utilised indigenous fisheries and agricultural products for inclusion in prawn feed. Assess local capacity and expertise to formulate and manufacture nutritionally balanced pelleted prawn feed. This will necessitate general survey of animal feed industry.
3. Ascertain economic feasibility of prawn feed manufacture in India on both large and small-scales.
4. If production at cooperative or similar level is economically viable, install and demonstrate feed mill for use by prawn farmers. Pilot plant components should ideally be of local manufacture. If production on large scale is commercially viable to make suitable recommendations to the Marine Products Export Development Authority.

Objectives: To optimise the utilisation of fish and fish products which, because they are unsuitable for human consumption, are currently wasted or used as agricultural fertiliser. Suitable prawn feed is in short supply in India, hence the possible availability of suitable indigenous fish material which could be incorporated in prawn feed formulation would greatly assist the development of local manufacture and remove a constraint to the continued development of prawn culture.

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Appendix 2

Project Management Plan: Improved marketing and processing of seaweed in India (ODA/P2/IND)

Terms of reference :

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

Objective: To determine the optimum strategy for domestic and international marketing of wild and farmed seaweed. Identify potential for artisanal processing and storage.

Appendix 3

Other recent ODA activities which are not part of the Post-harvest Project of the Bay of Bengal Programme are as follows:

1. Bangladesh. The Overseas Development Natural Resources Institute (U.K.) has reviewed post-harvest fisheries in Bangladesh and a number of project proposals are being considered byODA.

2. **India. ODNRI has a** collaborative programme with the Central Institute of Fisheries Technology. The second phase, started in 1986, included a feasibility study of the use Of flexible retortable pouches for fish preservation. It recommended that a pilot-scale production line be provided for CIFT to produce sufficient quantities of pouched fish for full-scale marketing trials, to demonstrate the process to industrial firms and to train operatives.

3. Indonesia. ODA has financed a study by Humberside College of Higher Education. (HCHE) on the reduction of losses of cured fish especially those due to insect infestation Attempts to reduce blowfly infestation of fish by screening during drying were unsuccessful and attention was turned to use of insecticides. ODNRI has shown in various parts of Africa that blowfly infestation of drying fish can be reduced to an extremely low level by the economic and safe use of pirimiphos-methyl.The use of this insecticide on fish and other food stuff has been approved by the WHO/FAO Codex Alimentarius Commission. HCHE in collaboration with ODN RI showed that pirimiphos methyl was also effective in reducing losses during the drying of salted fish in Indonesia. HCHE has begun extending this work by training Fisheries Department staff in the reduction of losses of cured fish.

   A project formulation mission recommended that ODA support a proposal on the development of prawn farming in brackishwater in Sumatra. This will include the establishment of a small post-harvest laboratory.

4. **Sri Lanka. ODNRI** advised the National Aquatic Resources Agency on strengthening the chemical analytical work of the Institute of Post-harvest Technology. Equipment and training needs were identified and a proposal has been submitted to ODA.

5. Thailand. HCHE has started an investigation, analogous to that in Indonesia, with the Fish Utilization Division of the Department of Fisheries. This will include an assessment of the effectiveness of pirimiphos methyl in controlling blowfly infestation. This study forms part of a proposed larger project in which ODNRI would work on various other post-harvest aspects of fisheries production.

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Annexure 1

SMALL-SCALE FISHERFOLK COMMUNITIES IN THE BAY OF BENGAL: SUMMARY OF PROJECT DOCUMENT

"Small-scale fisherfolk communities in the Bay of Bengal" (GCP/RAS/118/MUL) is a five-year project now under implementation by the FAO Bay of Bengal Programme (BOBP). The project commenced in 1987 and is set to terminate in 1991. It is funded by the Governments of Denmark and Sweden to the extent of about US $ 8 million. Seven countries— Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand—are members. The member countries contribute a total of US $ 100,000 every year towards project cost. The project grew out of BOBP's earlier project "Development of small-scale fisheries in the Bay of Bengal" (GCP/RAS/040/SWE), a project funded by the Swedish International Development Authority, which commenced in 1979 and ended in 1986.

BOBP is the support unit of the Bay of Bengal Committee (BOBC) in regard to those aspects of fisheries that are within the jurisdiction of the Committee.

In accordance with national development priorities in the region, "Small-scale fisherfolk communities in the Bay of Bengal" emphasises small-scale fisheries with specific reference to the following disciplines: extension support for fishing communities, brackishwater culture and fishing technology. The project supplements and supports national development projects. It will have a catalytic and consultative role and, to the extent possible, provide services to national projects on request by governments and donor agencies. It will utilise national and regional institutions for the implementation of activities. It will also provide on-the job training, in order to create a solid basis for the application of project results in the future.

The ultimate objective of GCP/RAS/118/MUL is the socio-economic betterment of small-scale fisherfolk in fishing communities of the Bay of Bengal region. The immediate project goals are development and demonstration of methodologies and technologies by which the ultimate objective may be achieved, and assistance to participating countries in applying these programmes on a wider scale by integrating them with government programmes for development of coastal areas.

The target groups are the poorer segments of the population in coastal fishing communities. Special consideration is given to the role of women — their contribution to the family income and the improvement of their economic and social situation.

The basic approach of the project is to deal with major problems and constraints inhibiting opportunities for improvement and development. Problems will generally be investigated through pilot scale activities. The scaling up of results and solutions from pilot scale activities is the responsibility of participating countries. The project follows a participatory approach in its pilot activities.

The overall responsibility for the implementation of the project rests with the FAO. The BOBP Programme Director is responsible for project implementation. Under the direction of the Programme Director, senior subject matter experts will plan and supervise technical activities. To ensure effective liaison with the BOBP as a whole, governments nominate National Liaison Officers. In addition, governments nominate Technical Liaison Officers for each individual discipline.

Effective documentation and dissemination of information regarding fisheries development issues in general and programme activities in particular are essential features of a regional programme. BOBP's information service has the following functions in this context:

—to enhance the catalytic role of the programme;

—to function as a clearing house;

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– to promote fisheries development and to build awareness on development issues;

— to ensure that the right type and quality of information is available for different audiences;

– to support preparation of extension and training materials;

– to ensure proper documentation.

Pilot activities are undertaken at different locations in the region. The work programme of the project is prepared in consultation with cooperating agencies. It is presented together with the progress report at the yearly meeting of the BOBC which reviews progress of work, identifies priority needs and thereby directs project orientation. More detailed reviews in respect of the work programme are undertaken by an Advisory Committee composed of representatives of member countries, donor countries/agencies and the FAO. The Advisory Committee meets once a year and wherever possible in conjunction with the BOBC.

1. **Extension Support for Betterment of Fishing Communities**

Scope: People-oriented extension methodology

Activities: The main activities of development, demonstration and introduction will concern:

– Curricula and training methods for training and education of trainers, extension personnel, village link workers and fisherfolk.

— Training aids—in particular, appropriate low-cost aids for various levels of trainees.

– Institutional arrangements for, and organization and coordination of fisheries extension services and village link worker networks.

– Alternative and supplementary income-earning opportunities in fishing villages, particularly for women.

– Schemes for direct bank finance for small-scale fisherfolk.

– Fisheries-related learning and teaching materials to be included in formal and non-formal, primary, secondary and adult education programmes within the framework of national programmes for the universalisation of elementary education.

– In-depth studies of basic issues on request by governments.

Examples: possible conflicts between small-scale and industrial fisheries, fishery management systems, marketing organization and market forces, incentive schemes, fisherfolk of organizations, etc.

2. Development of Small-Scale Brackishwater Culture

Scope: Farming of fish, crustaceans and other living organisms in marine and brackishwaters.

Activities: The project will address itself to the small-scale fisherfolk as the exclusive target group. All activities will therefore deal with techniques and methods within the reach of this sector, considering the limitations of finance, management and organization. More specifically, activities will be taken up in areas such as:

Opportunities for improvement and diversification of culture practices:

— small-scale oriented techniques such as pen culture, cage culture and open area/sea farming which also have no or limited adverse effects on the environment.

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— introduction of non-conventional species such as mussels and oysters.

— polyculture of suitable species to promote culture of fish for local consumption together with shrimps and other high-priced varieties.

Major techno-economic problems inhibiting development of brackishwater culture.

—wild seed potential and improvement of collection, handling and transport of seed.

— alternative nursery practices to increase the survival rate

— site selection and facilities and equipment/materials for different types of culture to minimize costs of investment and operation.

Management studies of coastal aquaculture pertaining to:

— alternatives and rights of land/water use, restriction, legislation and markets.

— studies of economic viability and social feasibility of the technology i.e. how and to what extent the target group can benefit.

3. Development of Small-Scale Fishing Technology

Scope: All matters related to small-scale capture fisheries such as methods, gear and design, construction and propulsion of craft.

Activities: The problems and opportunities of particular significance which the project will deal with are:

Improvement of existing fishing units

— motorization of country craft

— low cost propulsion systems

— diversification of fishing methods

— modification of gears (design and rigging) for efficiency and selectivity.

Adaptation and improvement of fishing methods with emphasis on energy-saving stationary gear

— set bag nets

—traps, trammel nets and glilnets, particularly for shrimp

— longlines and traps

— driftnets particularly for tuna

— fish aggregating devices

Demonstration of small and intermediate craft

— "Kattumarams" and "Orus" of alternative materials

— beachlanding craft

Studies of economic viability and social feasibility of new technology.

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Publications of the Bay of Bengal Programme (BOBP)

The BOBP brings out six types of publications.

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

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

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

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

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

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

A list of publications follows.

Reports (BOBP/REP/...)

1. Report of the First Meeting of the Advisory Committee. Colombo, Sri Lanka, 28—29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
2. Report of the Second Meeting of the Advisory Committee. Madras, India, 29—30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.l, FAO, Rome, 1978)
3. Report of the Third Meeting of the Advisory Committee. Chittagong, Bangladesh, 1—10 November 1978 Colombo, Sri Lanka, 1978. (Reissued Madras, India, September 1980)
4. Role of Women in Small-Scale Fisheries of the Bay of Bengal. Madras, India, October 1980.
5. Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development. Madras, India, 3—8 September 1979. Madras, India, April 1980.
6. Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries. Colombo, Sri Lanka, 8—12 October 1979. Madras, India, June 1980.
7. Report of the Fourth Meeting of the Advisory Committee. Phuket, Thailand, 27—30 November 1979. Madras, India, February 1980.
8. Pre-Feasibility Study of a Floating Fish Receiving and Distribution Unit for Dubla Char, Bangladesh. G. Eddie, M. T. Nathan. Madras, India, April 1980.
9. Report of the Training Course for Fish Marketing Personnel of Tamil Nadu. Madras, India, 3—14 December 1979. Madras, India, September 1980.

10.1 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16—21 June 1980. Volume 1: Proceedings. Madras, India, September 1980.

10.2 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16—21 June 1980. Volume 2: Papers. Madras, India, October 1980.

11. Report of the Fifth Meeting of the Advisory Committee. Penang, Malaysia, 4—7 November 1980. Madras, India,January 1981.
12. Report of the Training Course for Fish Marketing Personnel of Andhra Praclesh. Hyderabad, India, 11—26 November 1980. Madras, India, September 1981.
13. Report of the Sixth Meeting of the Advisory Committee. Colombo, Sri Lanka, 1—5 December 1981. Madras, India, February 1982.
14. Report of the First Phase of the "Aquaculture Demonstration for Small-Scale Fisheries Development Project" in Phang Nga Province, Thailand. Madras, India, March 1982.
15. Report of the Consultation-cum-Workshop on Development of Activities for Improvement of Coastal Fishing Families. Dacca, Bangladesh, October 27—November 6, 1981. Madras, India, May 1982.
16. Report of the Seventh Meeting of the Advisory Committee. New Delhi, India, January 17—21, 1983. Madras, India, March 1983.
17. Report of Investigations to Improve the Kattumaram of India's East Coast. Madras, India, July 1984.
18. Motorization of Country Craft, Bangladesh. Madras, India, July 1984.
19. Report of the Eighth Meeting of the Advisory Committee. Dhaka, Bangladesh, January 16—19, 1984. Madras, India, May 1984.

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20. Coastal Aquaculture Project for Shrimp and Finfish in Ban Merbok, Kedah, Malaysia. Madras, India, December 1984.
21. Income-Earning Activities for Women from Fishing Communities in Sri Lanka. E. Drewes. Madras, India, September 1985.
22. Report of the Ninth Meeting of the Advisory Committee. Bangkok, Thailand. February 25—26, 1985. Madras, India, May 1985.
23. Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka. Madras, India, March 1986.
24. Fisherwomen's Activities in Bangladesh: A Participatory Approach to Development. P. Natpracha, Madras, India, May 1986.
25. Attempts to Stimulate Development Activities in Fishing Communities of Adirampattinam, India. P. Natpracha, V.L.C. Pietersz. Madras, India, May 1986.
26. Report of the Tenth Meeting of the Advisory Committee. Male, Maldives. 17—18 February 1986. Madras, India, April 1986.
27. Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India. E. Drewes. Madras, India, May 1986.
28. Small-Scale Aquaculture Development Project in South Thailand: Results and Impact. E. Drewes. Madras, India, 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, India, July 1986.
30. Summary Report of Fishing Trials with Large-Mesh Driftnets in Bangladesh. Madras, India, May 1986.
31. In-Service Training Programme for Marine Fisheries Extension Officers of Orissa, India. U Tietze. Madras, India, August 1986.
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