
**Report of
the Fifth Meeting
of the
Advisory Committee**

Penang, Malaysia
November 4-7, 1980

Executing Agency :
**Food and Agriculture Organisation
of the United Nations**

Funding Agency:
**Swedish International
Development Authority**

Development of Small-Scale Fisheries in the Bay of Bengal
Madras, India, January 1981

PREFACE

This document is the report of the fifth meeting of the Advisory Committee of the programme "Development of Small-Scale Fisheries in the Bay of Bengal" referred to in brief as the "Bay of Bengal Programme". The meeting was hosted by the Government of Malaysia and held in Penang, Malaysia November 4-7, 1980.

The report records the deliberations and the conclusions of the meeting and was approved by the committee.

The report includes a summary of progress made by the BOBP in 1980, the second year of operation. It also discusses the outlines of future work. It therefore serves as a source of reference to officials of the countries concerned and might be of interest to other agencies and people engaged in small-scale fisheries development, particularly in the Bay of Bengal area.

"Development of Small-Scale Fisheries in the Bay of Bengal", GCP/RAS/040/SWE, is a regional **FAO** programme funded by the Swedish International Development Authority (SIDA) and executed by the Food and Agriculture Organization of the United Nations (FAO). Five countries are members- Bangladesh, India, Malaysia, Sri Lanka and Thailand.

The Programme's Advisory Committee is composed of representatives of the five member-countries, FAO and SIDA. The committee meets once a year. Earlier meetings were held in Colombo (1976), Madras (1977), Chittagong (1978), and Phuket (1979).

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REPORT OF THE FIFTH MEETING OF THE ADVISORY COMMIT-TEE

4 - 7 November, 1980, Penang, Malaysia

Introduction

1. The meeting was convened at the Palm Beach Hotel, Penang. A list of the participants is attached as Appendix 1.
2. Mr. Umpol Pongsuwana, Chairman of the Fourth Advisory Committee, called the meeting to order and requested Mr. P. Gurtner, Chief, Fisheries Technology Service, Fisheries Department, FAO, Rome to address the meeting.
3. Mr. Gurtner thanked the Government of Malaysia for hosting the meeting and the Government of Sweden for continuing to provide the essential financial resources for implementing the Bay of Bengal Programme for the development of small-scale fisheries. He emphasized the importance of full support and involvement by the national governments in the activities of the Programme for obtaining lasting benefits from its inputs. After two years of Programme operations, there were indications of tangible results from several Programme activities. He stated that the time was appropriate for deciding on the lines of action for the future, and referred to the presence of the mid-term review mission at the meeting. He noted the important role, in the early stages of the Programme, of the FAO/UNDP Indian Ocean Programme which terminated in 1979 -a role which had been taken over to a limited extent by the FAO/UNDP project, Small-Scale Fisheries Promotion in South Asia, as an interim solution, to be replaced by a Bay of Bengal Fisheries Management and Development inter-country project proposed for UNDP support from 1982.
4. Ms. E. Liljeberg, Senior Programme Officer, Agriculture Division, SIDA, Stockholm, thanked the Government of Malaysia for hosting the meeting and the staff of the Programme, consultants and FAO for the efficient conduct of the work programme. The discussions at the meeting could well mark a turning point for the Programme. Furthermore, the mid-term review mission which had just started its work would examine its achievements in relation to the benefits derived by the member countries and consider its future course. She stressed the importance for the region of avoiding the problem of over-fishing. Stock analysis at an early stage is essential also for the estimation of the number of fishermen who can earn their living in the area. Such an activity could perhaps form a basis for future cooperation between the member-countries themselves. On a personal note, she expressed particular satisfaction with the success of the women component of the aquaculture project in Thailand. She concluded by expressing her confidence in the decisions that would be made by the Committee.
5. Y. B.Tan Sri Arshad bin Ayub, Secretary General, Ministry of Agriculture, Malaysia, welcomed the members of the Advisory Committee to Malaysia and Penang. He expressed Malaysia's full support for the programme in the spirit of regional cooperation and the desire to improve the livelihood of the small-scale fishermen. Malaysia's attention was focussed on coastal aquaculture due to its high potential for development and the need for rational control and management of the coastal fish resources. Nevertheless, other aspects of the development of small-scale fisheries continued to receive the main emphasis in Malaysia's past and future plans. Referring to the Ban Merbok project which will verify the technical and economic feasibility of brackish water pond culture for a family sized unit, he expressed the hope that it would pave the way for the future development of coastal aquaculture for the whole country. He suggested that the programme should concentrate on fewer effective projects to make optimum use of its financial and manpower resources. He expressed satisfaction with the promotion of a TCDC approach by the Programme. He thanked the Government of Sweden for the generous funding for the Programme and hoped that the finances would be augmented

by other developed nations. He concluded by wishing the participants a pleasant stay in Penang.

6. Following the proposal of Sri Lanka, seconded by India, the Committee unanimously elected Mr. D. Pathansali, Deputy Director General of Fisheries, Ministry of Agriculture, Malaysia as chairman for the meeting.

7. The chairman thanked Mr. Umpol Pongsuwana, the outgoing chairman, for presiding over the inauguration and the committee for electing him chairman.

8. The agenda was approved as proposed and is attached as Appendix 2.

9. A drafting committee with Mr. Kachornsak as chairman was appointed to facilitate the preparation of the report of the meeting.

Progress Report

10. The Programme Director in presenting the progress report expressed his pleasure at being able to report some definite achievements, but noted also that progress in some activities had been less satisfactory. The work programme agreed on at the 4th Advisory Committee had by and large been followed. A few adjustments had necessarily to be made but these did not involve any significant deviations.

11. He summarized the work done during the year in respect of the various activities, set out in detail in the Progress Report attached as Appendix 3.

12. Slides were shown to illustrate aspects of the small-scale fisheries situation in some countries of the region and the Beach Craft Development Project in India.

Fishing Gear and Methods

13. Bangladesh considered the results of the Fishing Gear Improvement project and of the initial stage of the Two-Boat Trawling project to be encouraging and expressed interest in continuing with these two projects.

14. India suggested that a project for lobster potting, trap and line fishing be considered in the area of the Kanyakumari coast where the rocky bottom precludes trawling.

15. India suggested that the project Cottage Industry for Net Making should not be discontinued and that assistance should be sought from appropriate technology institutes in India. The Programme Director stated that enquiries from a number of such institutes had not elicited any response.

16. Sri Lanka suggested that the definite results obtained from the Fishing Gear Improvement project be followed up through projects such as the Extension Training project in Batticaloa. In the Demersal Fishing project, deployment of necessary counterpart staff had been arranged and continuance of assistance by the programme was requested for this project.

17. The Committee took note of the likely problems and disadvantages inherent in the introduction of an efficient fishing method like trawling, particularly in inshore waters fished by small-scale fishermen, and of the need for proper planning of the development and management in the introduction of such fishing methods.

18. Malaysia suggested that the Programme should once more endeavour to investigate whether the use of rubber for boatbuilding could at all be considered. The Programme Director stated that the Programme was not competent to carry out the type of research and development work that was needed but that some inputs such as naval architectural expertise could be contributed to any research institute that might be prepared to undertake the experiments. Sri Lanka while supporting the Malaysia proposal agreed to the continuance of the project on these lines.

19. Commenting on the study of boatbuilding materials, India suggested that in-depth consideration be given to the use of ferrocement as a boatbuilding material. FAO however, pointed out that while ferro-cement was certainly a suitable material for larger fishing boats, its use for the type of fishing boat used by small-scale fishermen was unlikely to be of advantage.

20. In regard to the Beach Craft Development project in India it was noted that the "buoyancy block" prototype had so far stood up well to rough handling. In response to a question from SIDA regarding the manner in which the results will be disseminated to the fishermen, the Programme Director stated that if the fishing trials presently under way in Andhra Pradesh were successful, a number of prototypes might be built and made available for use by fishermen. It was generally agreed that it was desirable for the Programme to use existing boatyards for construction of the prototypes.

Fish Utilisation

21. In regard to the Fresh Fish Handling project in Orissa it was noted that while there would have been more progress if there had been better counterpart input, there had also been an initial over-estimation of the benefits to be derived from better handling. In this connection, Malaysia referred to a national project being started for the subsidized issue of insulated fibre-glass fish boxes for use on board fishing vessels, and offered to make designs of the boxes available.

Coastal Aquaculture

22. Malaysia reported the position regarding the implementation of the Ban Merbok project. There had been a six-month delay in commencement due to the need to make a choice from two alternative sites for the ponds. Construction work has commenced and is expected to be completed in July 1981.

23. A progress report on the Phang Nga aquaculture project was given by Thailand. Particular attention was drawn to the progress made in cockle culture and to the close collaboration between the project and the provincial government. It is planned to expand this type of activity to other provinces with support from the Programme.

24. The committee noted the progress so far made in the two projects.

Extension Services

25. The committee took note of the survey that was being conducted by the Women's Bureau of Sri Lanka in several fishing villages to ascertain the role of women in the fishing communities and the commitment of the Programme to support a follow-up project.

Fishery Resources

26. SIDA stressed the importance of stock management between countries as well as between groups of fishermen. In response to a request from SIDA for information regarding the Bay of Bengal support programmes for fisheries development and resources monitoring, FAO stated that it was attempting to mobilise external funds for a support unit, and that when the Bay of Bengal Fisheries Committee was set up, one of its most important functions would be facilitating the creation of a suitable mechanism for resource monitoring.

Information Services

27. SIDA appreciated the work done in this area-as reflected in the reports and working papers, the information disseminated through the news media and the bi-monthly status reports and expressed the hope that this effort would continue in the future.

28. In connection with the extension leaflet that was being published in Sri Lanka in respect of fishing gear improvements, the committee felt that although it may be appropriate in the context of Sri Lanka's high literacy rate, demonstrations and study tours might have better

impact with fishermen than printed material. The Committee recognized the need to evaluate the impact of the latter carefully before more money is spent on this form of information dissemination.

Project Inputs

29. In response to a request from the chairman that a breakdown of the cost of the various project activities be made available to the Committee as undertaken at the last meeting, the Programme Director tabled a statement. In presenting the statement he explained the problems and limitations related to accounting procedures which made it necessary to present an estimate rather than a final statement which was also one of the reasons for not including it as one of the official documents.

30. FAO stressed the importance of the provision of adequate counterpart staff to the project activities. The Committee discussed this problem. Sri Lanka considered it necessary to make an in-depth examination of this problem to find out the reasons and to attempt a solution. The Programme Director referred to some of the factors involved — insufficient staff in some administrations, the lack of experienced staff, procedural problems in reassigning staff, and sometimes differences in the priorities attached to projects by the administrations and the Programme. It was decided to discuss this matter more fully under agenda item 5 (Govt. input).

31. In response to a request from Sri Lanka the Programme Director described the procedure followed in recruitment of international staff. Sri Lanka stressed the need to find ways and means to avoid recruitment delays in the future.

Tripartite Review of RAS/77/044

32. During a session recess, the third Tripartite Review of the FAO/UNDP Project, Small-Scale Fisheries Promotion in South Asia, RAS/77/044, was conducted. The review was attended by the delegates from Bangladesh, India, Sri Lanka and Thailand and the representatives of FAO and UNDP. Malaysia attended as an observer.

33. The review meeting expressed its appreciation of the work carried out by the project.

34. The meeting agreed with the work programme proposed by the Project Manager for the year 1981, the final year of project operations. Sri Lanka requested that assistance under this project be made available for cost and earnings studies, a study on fish marketing and for the holding of the proposed fisheries census. The Project Manager stated that this would be possible but mentioned the limited capacity of the project and that additional inputs—from the national (UNDP) IPF for instance— would probably have to be mobilized for this purpose.

35. FAO informed the meeting of a proposed fisheries development and management support programme for the Bay of Bengal, conceived as a technical support unit to the Bay of Bengal Fisheries Committee, expected to be established in the near future, and for which UNDP funding would be sought. An information paper outlining the proposal was made available to the meeting.

36. All participating countries at the meeting also agreed that the Government of the Maldives, subject to its willingness to join the programme, be regarded as a participating state, and requested the FAO to convey this to the Government of the Maldives. India, while endorsing this in principle, indicated that the position of its delegation was subject to confirmation by his Government.

37. Sri Lanka, while strongly supporting the proposed programme, noted that it would have been preferable to discuss this issue on the basis of a detailed project proposal rather than a summary only. The full support Sri Lanka had given to this concept on earlier occasions was reiterated. Referring to the obligations of the host country referred to in the last paragraph of the information document tabled at the meeting, Sri Lanka stated that it was in the spirit of making its own contribution to the programme that Sri Lanka had originally offered to host the programme and reiterated this offer of its Government.

38. All countries fully endorsed the position taken by Sri Lanka.
39. Malaysia endorsed the concept of a separate development and management body and technical support programme for the Bay of Bengal, but reserved its position in regard to its membership and support pending the study by the Government of Malaysia of a firm draft proposal.
40. UNDP informed the meeting that it was in principle prepared to support regional cooperation on a sub-regional basis as was proposed, within certain limiting conditions. These were that UNDP would be willing, if required, to assist in financing the technical support unit up to \$200,000 per annum for an initial two years, provided there was at least 50 per cent cost sharing by participating governments. UNDP support for programmes and projects, both national and regional, resulting from the future Bay of Bengal Fisheries Committee's work would be possible and would be considered on their merits.
41. The representative of Sri Lanka reaffirmed and reiterated the importance and the high priority that Sri Lanka accorded to the goals and objectives of the programme, although the details of the programme had still to be worked out. He pointed out that whilst the countries were fully committed to this programme, factors beyond their control could make it impossible for several countries, particularly the Least Developed and Most Seriously Affected countries, to give in the short run financial support to the programme. He requested the representative of the UNDP to convey to the Administrator of the UNDP, their request that the UNDP review its new policy on financial commitments and take a realistic view of the problem. He also suggested that upon return to their capitals, participants should urge the national aid coordinating authorities for UNDP programmes to support and give high priority to the proposed Bay of Bengal Fisheries Programme. If this programme should fail to come into being as a result of this new policy of UNDP, considerable resources and effort already spent would have been wasted, as the effects of its application would be retrospective.
42. The countries represented at the meeting endorsed unanimously the strong case made by Sri Lanka for substantially increased UNDP support to the technical support unit. The **representative** of India, endorsing the Sri Lanka statement, pointed out that participating countries in all programmes do in fact make some contribution to the programmes and that thinking in terms of rigid percentages is likely to be counter-productive.
43. The representative of UNDP agreed to convey the meeting's message as forcefully expressed by Sri Lanka and endorsed by the other countries, to his headquarters. He reiterated however the UNDP view that the coming into being of a new programme largely depended on the priorities which governments themselves would give in terms of financial support. In such a case UNDP was ready to supplement such national efforts.
- 4.4. FAO undertook to provide additional information, including a draft project proposal, to the participating governments as a matter of urgency to assist them in determining their respective national priority proposals for regional UNDP support in preparation for the meeting of regional and coordinating authorities expected to be held in New Delhi in February 1981.

Review of Scope and Objectives

45. The Programme Director invited attention to the fact that this area had been thoroughly discussed at the 4th Advisory Committee Meeting and referred the Committee to the relevant **portions** of the Report of that meeting. The Committee was also reminded that the mid-term review mission would be dealing with this subject area. Members were, however, invited to make specific comments on any subject to which they attached special importance.

Coastal Aquaculture

46. Reflecting the high priority given to this subject area in the 4th Advisory Committee meeting all member countries stressed the importance which they place upon development of this sector in the future fisheries economies of their individual countries.

Stock Assessment

47. In response to a query from SIDA there was considerable discussion on the importance of stock assessment, not only in relation to coastal and small-scale fisheries, but also in the wider context of the Bay of Bengal as a whole. There was also discussion of the relative positions of the BOBP and the projected Bay of Bengal Fisheries Committee in respect of this particular subject area. Sri Lanka indicated the necessity to follow up the work on stock assessment already done by the programme.

48. FAO confirmed the organization's commitment to the establishment of a Bay of Bengal Fisheries Committee, but was unable however to define a time frame for its establishment and stated that there should be little difficulty in distinguishing between the relative responsibilities of the Committee and BOBP.

49. It was further noted that UNDP had undertaken to assist in the establishment and funding of the newly proposed support programme to the Bay of Bengal Fisheries Committee subject to certain "cost sharing" parameters.

50. SIDA expressed its awareness of the possibility that development of fisheries in the region resulting from its funding contribution to the Programme might have a detrimental effect if it leads to an unregulated growth of the fisheries. SIDA therefore strongly emphasized the importance of developing the coastal fisheries in accordance with proper scientific advice in order to avoid overfishing of economically important fish stocks.

51. The Advisory Committee recognized that there was an urgent need for stock assessment. What remained to be determined, however, was where responsibility for initiating activity in this sphere should rest. It was decided to re-examine this issue later under agenda item 4 (Work Programme).

52. The Programme Director referred to the differences in the exploitation of marine resources on the eastern and western sides of the Bay of Bengal and the fact that it was estimated that production from the western side could be doubled. In view of the potential impact of introducing new and improved fishing gears such as trawling and purse seining, he asked the advice of the Committee regarding the overall strategy to be adopted. Should production capacity be developed as rapidly as possible, or should a more gradual approach be adopted taking cognizance of the need to assess fish stocks and plan development so that overfishing and all its attendant problems did not arise? The Committee's view was that the gradual approach was more rational.

Work Programme

53. There was a general consensus in the Committee both in respect of the criteria for project selection and the Work Programme (Appendix 4) as presented by the Programme Director. The work programme was discussed in greater detail with particular attention being paid to new proposals. It was noted that some 20 ongoing projects were envisaged; 5 projects would be discontinued, and 15 new projects would be added to the programme. Certain reservations were noted, of which the more important are recorded below.

54. In the field of Fishing Gear and Methods, India reiterated its request that the discontinuance of the Two-boat Trawling Project be followed by a new project for trap fishing and lobster potting off the Kanyakumari coast.

55. India expressed reservations regarding the use of aluminium in boat building and continued to press for more active interest in the use of ferrocement despite the recommendations to the contrary by the Consultation on Fishing Vessel Technology.

56. Sri Lanka indicated that she was attaching very high priority to the development of boat hauling devices, beach landing craft and sailing craft and requested that the Programme should continue its activities in these areas.

57. It was suggested by Bangladesh that attention should be focussed on the sheathing of wooden hulls with plastic or fibreglass to enhance durability.

58. Regarding the Reinforced Rubber Boats project it was suggested that the Programme should seek to interest a suitable institute to undertake the essential research and development work involved with supportive inputs from the Programme.

59. All countries strongly endorsed the coastal aquaculture projects and accorded high priority to this subject matter area.

60. Member countries emphasised the need for stock assessment and supported a proposed workshop which can be organized by Thailand following a request of the Programme. There was general agreement that such a workshop should concentrate on training to provide orientation in the considerable improvements in stock assessment techniques evolved in recent years, in respect of which expertise is available also from within the region.

61. All countries were keenly conscious of the need for energy saving; there was general endorsement of the new proposals to pay greater attention to improvement of sailing performance of traditional craft and for the development of new sailing boats.

62. The need to continue and extend information services, was recognized and endorsed.

63. Concern was expressed about the large number of projects and activities and if reductions have to be made for capacity reasons, priority should be given to those that have been specifically endorsed by the Committee in this and earlier meetings.

Government Input

64. Reference was made to earlier discussions concerning the lack of counterpart support to some Programme activities. It was pointed out by the Programme Director that while some activities had adequate counterpart support, improvements could be effected.

65. FAO reiterated the importance of satisfactory counterpart input to assure continuance of work even when the programme inputs had come to an end. To this end it would be useful if Governments could be informed of the counterpart staff requirements well before the commencement of specific activities. This would facilitate full appreciation of the required commitment and appropriate action could be taken at an early stage.

66. All delegations recognized the importance of assigning counterparts to all Programme activities and agreed that where problems existed in this regard solutions should be found as a matter of priority. These problems may arise due to various reasons, such as difficulties in securing funds to recruit additional staff, brain drain, non-availability of suitable technicians, lack of continuity of national staff positions, and commitments by local staff to other projects and programmes. Bangladesh indicated that counterparts have been provided for Programme activities but because of limited staff availability the number of activities supported by it might have to be limited. Malaysia stated that it will continue to assign the necessary counterpart staff for its Ban Merbok project on a continuous and sustained basis.

67. With the full support of the other delegations, Sri Lanka suggested that the Programme :

- (i) identify specific requirements for counterparts well before starting new activities
- (ii) if necessary, arrange crash training courses for designated counterparts who may lack technical skills and
- (iii) explore the possibility of topping up emoluments from external sources as an incentive to retain/bring back local expertise.

TCDC

68. The Programme Consultant (TCDC) summarized his preliminary report (document AC5/8) which assesses the possibilities for TCDC activities within the fisheries sector of the Bay of Bengal region. He emphasized the need for supportive funds as a basic requirement for most TCDC activities, and pointed out that fisheries is only one element of TCDC, and stiff competi-

tion could therefore be expected for any supporting funds available. His report proposes various TCDC activities within the region and indicates that coastal and brackish water fisheries aroused the most interest.

69. Sri Lanka pointed out that the TCDC concept is at the core of regional development as neighbouring countries and regions could benefit greatly and much duplication of effort could be avoided by sharing common problems and experiences. Regional fishery programmes such as the BOBP could therefore play a significant role for fostering TCDC since they were directly in contact with regional fisheries expertise, were familiar with various institutions and organizations in the region which could facilitate TCDC and could in some cases, locate or provide supportive financing.

70. Following a proposal by Sri Lanka the Committee agreed that the BOBP and the SCSP should strengthen their current interactions on TCDC matters. It was suggested that through such arrangements between two regional programmes, current TCDC activities should be monitored, a register of relevant fishery experts in the two regions should be prepared and disseminated to member countries and that there should be an exchange of information on training programmes and other relevant activities that could be of interest to countries of the two regions.

Other Matters

Linkage with other FAO programmes/projects

71. FAO endeavoured to clarify the relationships between the proposed Bay of Bengal Fisheries Committee, and ongoing, pipeline and proposed programmes and projects in the fisheries sector in the Bay of Bengal area by means of a graphical representation.

72. The Committee took note of this presentation and expressed the view that it reflected in broad terms the concept of an umbrella programme with its associated inputs and the coordinating structure provided by an FAO fishery body.

Mid-Term Review

73. The Committee noted with regret that due to circumstances beyond FAO's control it had not been possible to recruit the third independent member for the review-mission.

74. The proposal to associate country representatives with the final stages of the mission's work at programme headquarters in Madras was accepted by the Committee. It was felt that this was especially important in view of the imbalanced composition of the mission, and would assist in early availability to the participating countries of the mission's principal conclusions and recommendations.

75. The Secretariat undertook to formally request the participating governments to send country representatives for a meeting in Madras on 8 and 9 December; it would also initiate travel arrangements for these officers immediately.

76. The Committee heard a short statement by the leader of the review mission on the scope and purpose of the mission, and assured him unanimously of the fullest cooperation during the forthcoming visit of the mission to the participating countries.

Reports

77. The Committee endorsed the suggestion made by the Programme Director, that the report of the review mission could be accepted in lieu of the full report on project achievements due at the end of the second year of programme operations as stipulated in the project document. At the suggestion of Sri Lanka, the Committee further agreed that the Programme Director should feel free to supplement the review mission report by highlighting any particular problem or outstanding success at his discretion.

78. In view of the considerable value of periodic progress reports for monitoring purposes by the countries, SIDA, FAO and Thailand suggested that such reports should henceforth be prepared at quarterly intervals rather than every two months. The Committee again proposed that the Programme Director should feel free to submit interim reports on any significant issue at his discretion.

Next Meeting

79. The delegate of Sri Lanka extended his Government's invitation to the Committee to hold its sixth meeting in Sri Lanka following the rotational principle adopted in the past.

80. On behalf of the Committee members, the Chairman was pleased to accept the invitation of Sri Lanka and warmly thanked the Government of Sri Lanka for its readiness to host the 6th Advisory Committee Meeting.

81. The Committee agreed that its 6th meeting should be held as late as possible in 1981 and tentatively agreed on the first week of December as a suitable period, details to be arranged between the Secretariat and the Government of Sri Lanka.

82. At the suggestion of SIDA, the Committee recommended that the Secretariat review the form of the meeting and the type of proceedings so far followed for the Advisory Committee, in consultation with the participating countries, SIDA and FAO.

Adoption of Report

83. The above report was adopted by the Committee.

Concluding Remarks

84. At the concluding session, following the adoption of the report of the meeting, delegates of India, Bangladesh, Thailand and Sri Lanka thanked the host Government for the hospitality extended, the excellent arrangements for the meeting and the field trip and expressed their appreciation of the conduct of the meeting by the Chairman, the respective roles of SIDA and FAO in funding and executing the project and of the work done by the Programme Director and his staff in implementing the Programme and in preparing the meeting. The delegates of Bangladesh and Sri Lanka made particular reference to the importance of continuity in the representation at the meeting in order to make the role of the Advisory Committee fruitful and effective.

On behalf of FAO, Mr. P. Gurtner expressed his thanks to the Government of Malaysia for its hospitality and the hope that the discussions at the meeting would have a positive impact on the execution of the Programme.

On behalf of SIDA, Dr. A. Lindquist emphasized the importance of the meeting and of the results of the Mid-Term Review Mission to follow for the future course of the Programme and expressed his appreciation of the hospitality extended by the Government of Malaysia and of the positive experience afforded by the field trip.

In adjourning the meeting the Chairman thanked the participants for their cooperation and wished them safe journey.

Appendix 1

BAY OF BENGAL PROGRAMME

AC5/3 Rev. 1

Development of Small-Scale Fisheries

(GCP/RAS/040/SWE)

5th Advisory Committee Meeting, 4-7 November 1980, Penang, Malaysia

LIST OF PARTICIPANTS

Bangladesh

| | |
|---------------------|--|
| Mr. B. R. Chaudhury | Dy. Secretary Ministry of Fisheries & Livestock, Dacca |
| Mr. A. H. A. Jalil | Asst. Director of Fisheries Directorate of Fisheries, Dacca |

India

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|--------------------|--|
| Mr. M. A. K. Tayab | Joint Secretary (Fisheries) Ministry of Agriculture, New Delhi |
| Mr. C. Chellappan | Director of Fisheries Government of Tamil Nadu, Madras |
| Mr. P. Tripathy | Secretary Forestry, Fishery and Animal Husbandry Government of Orissa, Bhubaneswar |

Malaysia

| | |
|---------------------|--|
| Mr. D. Pathansali | Dy. Director-General of Fisheries Ministry of Agriculture, Kuala Lumpur |
| Mr. Mazlan Jusoh | Senior Fisheries Officer Fisheries Division, Ministry of Agriculture, Kuala Lumpur |
| Mr. Sabri Ahmed | Director, Fisheries Division, Majuikan |
| Mr. Choy Siew Kiong | Director of Fisheries, Kedah State |

Sri Lanka

| | |
|--------------------------|--|
| Mr. Susantha de Alwis | Ambassador to Japan, Tokyo |
| Mr. Hiran W. Jayawardene | Ambassador, Special Adviser, Law of the Sea, Ministry of Foreign Affairs, Colombo |
| Mr. C. R. Fernando | Director, Planning and Programming Ministry of Fisheries, Colombo |

Thailand

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|----------------------|---|
| Mr. Umpol Pongsuwana | Director, Brackish Water Fisheries Division Department of Fisheries, Bangkok |
| Mr. W. Kachornsak | Chief, Fisheries Economics Unit Department of Fisheries, Bangkok |

SIDA

| | |
|------------------------------|---|
| Ms. E. Liljeberg | Senior Programme Officer Agriculture Division, Stockholm |
| Dr. A. Lindquist | Director, Board of Fisheries Marine Research Laboratory, Lysekil |
| Mr. L. Hannerz (observer) | Director-General, Fisheries Board Goteborg |

UNDP

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|---------------|--|
| Mr. J. Huyser | Resident Representative in India New Delhi, |
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FAO (Fisheries Department)

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|----------------|---|
| Mr. P. Gurtner | Chief, Fisheries Technology Service Fisheries Department, Rome |
| Mr. E. Oswald | Dy. Programme Leader South China Sea Programme, Manila |

FAO (India)

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|-----------------|----------------------------------|
| Dr. A. S. Alwan | FAO Representative New Delhi, |
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Mid- Term Review Mission

| | |
|-------------------------|--------------------------------------|
| Mr. A. R. Ayazi (FAO) | Chief, Evaluation Service, FAO, Rome |
| Mr. G. O. Utbult (SIDA) | Fisheries Board, Sweden |

Secretariat (BOBP)

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|-----------------------|------------------------------------|
| Mr. L. O. Engvall | Programme Director, Madras |
| Mr. V. L. C. Pietersz | Development Adviser, Madras |
| Mr. A. Kashem | Project Officer, Bangladesh, Dacca |
| Mr. E. H. Nichols | Consultant (TCDC) |
| Ms. S. Scurville | Senior Secretary, Madras |

Secretariat (Host Government)

| | |
|--------------------|--|
| Mr. V. Palanisamy | Research Officer Fisheries Research Institute, Penang |
| Ms. Cheah Lay Swee | Secretary |

Appendix 2

BAY OF BENGAL PROGRAMME

AC5/4

Development of Small-Scale Fisheries

(GCP/RAS/040/SWE)

5th Advisory Committee Meeting, 4-7 November 1980, Penang, Malaysia

ANNOTATED AGENDA (Provisional)

1. Introduction : (Tue 4/11 at 0900)

1.1 Opening of the meeting

1.2 Election of Chairman

1.3 Adoption of the agenda

2. Progress Report

The Progress Report, prepared by the Programme and presented in document AC5/6, gives an account of Programme implementation during the past year i.e. 1980 and highlights achievements and the problems encountered. The basis for implementation has been the work programme endorsed by the Committee in its 3rd and 4th meetings. Despite some inevitable delays and minor deviations, the programme has by and large been implemented as envisaged. Some achievements in Beach Craft Development and in activities concerning Fishing Gear and Methods perhaps merit particular mention. No major problems have been encountered but the delays in assignment of counterpart staff engender serious concern for future sustained operations. (This will be discussed under agenda item 5). The Committee is invited to comment on the performance of the Programme as a whole, subject matter areas or specific activities.

3. Scope and Objectives (Wed. 5/11 at 1030)

The scope and objectives were extensively discussed at the 4th meeting of the Committee and the results of these deliberations are contained in the report of the meeting. In view of this and the forthcoming mid-term review it is felt that an extensive discussion on this item is not necessary, but participants may wish to make specific comments. One particular area, coastal aquaculture, has been accorded an increasingly high priority by member governments; if this continues it will have to be reflected in the staffing of the Programme.

4. Work Programme

On the basis of the progress of ongoing activities, discussions with cooperating agencies and the two recent consultations on Fishing Gear and Fishing Craft Technology, an outline of the work programme has been prepared and is presented in document AC5/7. Detailed plans are subject to the views expressed in this meeting and subsequent discussion with the cooperating agencies. The outline suggests very few new activities. The concept is to restrict the activities to a few key areas and retain flexibility for ad hoc advice for which the need is indeed increasingly felt. The views of the committee are sought.

5. Government input (Wed. 5/11 at 1400)

During nearly two years of operation, several activities have been implemented with little or no counterpart staff actively involved. This may be passable in an initial phase but is of course highly unsatisfactory in the long term. Most of the work undertaken by the Programme relates

to technology development which, to be fruitful, will have to be demonstrated and extended. Without intimate involvement from national organisations/institutions in this technology development, dissemination will be less effective and the beneficial impact of the Programme's work much less. The shortcomings in counterpart staff input also hamper the international staff in planning and monitoring activities; they often have to attend to the minutiae of administrative, organizational and supervisory arrangements for which national staff are in any case better equipped. For future national activities it is suggested that implementation be conditional on well-defined staff input commitments by the Governments concerned. Wherever qualified manpower is lacking, the Programme would help create such manpower, by providing in-service and fellowship training to the assigned counterpart staff.

6. TCDC

The 4th Advisory Committee meeting endorsed a suggestion for a document outlining the give-and-take possibilities of the participating countries in subjects covered by the Bay of Bengal Programme. A consultant has been engaged for this purpose and a summary report of his findings is presented in document AC5/8. In the consultant's terms of reference the TCDC area was not restricted to small-scale fisheries only. This would have imposed an artificial limit on the possibilities since it may often be a matter of "taking" in small-scale fisheries and "giving" in other fisheries sectors or vice versa.

7. Other Matters

7.1 *Linkage with other FAO programmes/projects*

The Committee may wish to comment on the Programme's interaction with other FAO-executed inter-regional, regional and national programmes/projects in the Bay of Bengal area. Of particular interest may be the proposal for a UNDP-funded fisheries development project for the Bay of Bengal as a supporting unit to the Bay of Bengal Committee which IOFC has resolved to establish. A list of ongoing and proposed programmes/projects is provided in document AC5/9.

7.2 *Mid-Term Review*

As agreed in the 4th meeting of the Committee, a mission will review the Programme in November/December this year. The mission is scheduled to participate in this meeting and particular matters related to the review may be discussed.

7.3 *Reports*

The project document, in section 5 Reporting, stipulates that a report of project achievements will be produced by the end of the second year. This would not be necessary: the report of the review mission may be a better substitute.

A suggestion has been made that the Programme issue a six-monthly report between the Advisory Committee meetings. The Committee's views are sought.

7.4 *Next meeting*

With this 5th meeting, all the participating countries have hosted the Advisory Committee meeting. For the future, consideration should be given to hold these meetings at the Programme's headquarters in Madras; this would simplify administrative arrangements and reduce costs; improve the access to more detailed information and reference material; and facilitate informal discussions with staff of the Programme.

Since the Programme is reviewed on a calendar year basis, the Advisory Committee meetings are preferred as late as possible in the year. This would facilitate distribution in advance to the committee members of the progress report, work programme and other substantive documents.

8. Adoption of Report (Fri. 7/1 1 at 0900)

Appendix 3

BAY OF BENGAL PROGRAMME

AC5/6

Development of Small-Scale Fisheries

(GCP/RAS/040/SWE)

5th Advisory Committee Meeting, 4-7 November 1980, Penang, Malaysia

PROGRESS REPORT - 1980

The progress report that follows describes the implementation of the Programme during the past year on the basis of the work programme endorsed by the Committee in its third and fourth meetings.

The programme has by and large been implemented as envisaged. There have been both bright spots and blurs. Under the first category come some achievements in craft and gear, coastal aquaculture and in stock assessment. Specifically, the beachcraft development project in India made good progress; the fishing gear improvement projects in Bangladesh and Sri Lanka led to definite conclusions; the progress of and response to the high-opening bottom-trawl project in Tamil Nadu were encouraging; the stock assessment consultation held in Chittagong was a useful exercise; the coastal aquaculture project in Thailand made good progress. The demersal fishing project in Sri Lanka yielded some conclusions, albeit negative. The "blurs" include the coastal aquaculture project in Malaysia, which was hit by delays, and activities in the area of fish handling and utilisation in India which fell below expectations.

Certain activities mentioned in the work programme were not taken up for unavoidable reasons. Work on sail and engineering aspects of fishing craft, with particular reference to energy saving devices, was endorsed by the 4th A.C. meeting. However, in the budget for 1980, provision for a Fisheries Engineer post could be made for only six months; the arrival of the incumbent was delayed by a further two months. Hence, time was insufficient to implement these activities. Likewise, women-related activities failed to make the expected progress during the year because of the 8-month delay in the arrival of the expert.

On implementation of projects, the one problem frequently encountered was the inadequacy of counterpart effort. This is a problem member-governments should address themselves to in earnest. A vigorous counterpart effort is essential both for close day-to-day monitoring of activities and for transfer of know-how and sustained benefit from the Programme.

The inputs provided for the second year of operation have been used to the extent of about 75%. Below-budget expenditure areas include those on staff and contractual services. There has been under-utilization of the training component as well, but the performance in this area has picked up since the previous year.

All international Programme staff provided for in the budget have been recruited. Three new associate experts who are funded by their respective countries joined at the end of the reporting year.

The experience of the Programme in the matter of sub-contracting national organizations, private and public, as well as individuals, continues to be positive.

Individual country reviews of BOBP activities with officials of the countries were held this year in Bangladesh, India and Sri Lanka. The reviews served as a valuable monitoring mechanism. Subject-oriented reviews -technical consultations — were held in fishing craft and fishing gear/methods with experts, mainly from the Bay of Bengal region.

ACCOUNT OF PROJECT ACTIVITIES

Fishing Gear and Methods

1. *Fishing Method Diversification (BGD/FMD)*

To identify suitable fishing methods for diversified fishing operations in Bangladesh.

2. Fishing trials were conducted during the 1979/80 winter season under the direction of a consultant masterfisherman in the Dubla Char area. Two small (38 ft.) fishing boats and a support vessel were used in cooperation with the BFDC. Because of technical problems with the support vessel, the effective fishing period was only about six weeks. Different fishing gears-trawls, longlines and gillnets- were tried. The results were very disappointing; it was only the small-boat trawling that showed some promise.

3. It has therefore been decided to continue the trawling effort. Two-boat trawling activity started from Cox's Bazar end-October 1980. The fishing operations are being conducted in cooperation with the Swedish Free Mission project at Bhola which already has some experience with this type of fishing. Since the prime purpose of the effort is to demonstrate the fishing method, Cox's Bazar was selected as base; logistics and good marketing outlets for fish caught were the criteria. The trials will go on for about six months.

4. *Fishing Gear Improvement (BGD/FGI)*

To improve the large-mesh driftnet and the set-bag net (behundi) fisheries in Bangladesh by reducing capital and maintenance costs at maintained or augmented catching efficiency.

5. Fishing trials for improving the large-mesh driftnets were undertaken between October 1979 and February 1980 in cooperation with CARITAS. A comparative study of the data revealed that PA nylon nets of thinner twine size, which cost about 40% less than the nets now in use, caught about 40% more fish. Polyethylene (PE) nets which cost even less, also caught about 40% more fish but sustained greater damage.

6. To further promote and demonstrate the use of thinner twine driftnets, a demonstration and extension programme, in one of the major fishing centres where the traditional heavy twine driftnets are used, commenced end-October 1980.

7. In order to determine the most suitable mesh size for the driftnet fishery, further fishing trials with nets of mesh sizes ranging from 100 to 180 mm (4" to 7") stretched mesh, commenced early November.

8. Fishing trials for the improvement of set-bag nets commenced early August 1980. The nets were hand-braided and made out of polyethylene twine which is cheaper and more resistant than nylon. The polyethylene nets catch as much as those made of nylon. The use of polyethylene material reduced the initial cost by approximately 25%. The trials continue, to ascertain the durability of the material.

9. Problems have been encountered in monitoring the activities, particularly in data collection, in the absence of counterpart staff. At the end of the reporting period two officers have been assigned. Together with the fleet manager of CARITAS, they have undertaken a study tour to Sri Lanka to observe the relatively advanced large-mesh driftnet fishery there.

10. *Two-boat Trawling (IND/TBT)*

To study the economic feasibility of diversion of fishing effort from shrimp to fish in the inshore trawl fishery in Palk Bay and Gulf of Mannar, Tamil Nadu, India.

11. The project commenced early February 1980. It is being implemented in cooperation with the Directorate of Fisheries, Tamil Nadu, which has provided two boats and adequate counterpart input. The fishing operations have been going on continuously at a high rate of

intensity from Mandapam and Tuticorin. Preliminary findings are very encouraging and indicate that, through technical innovations, the diversion of fishing effort from shrimp to food fish is economically feasible (BOBP/WP/10).

12. The project is planned for one year and should terminate February 1981. After an evaluation, discussions with State and GOI fishery authorities will determine the follow up.

13. Demersal Fishing (SRL/DEF)

To develop and demonstrate demersal fishing gear and methods for harvesting under-exploited demersal resources in Sri Lanka.

14. Fishing trials for improvement and expansion of bottom set longlining were undertaken from October 1979 until March 1980. They were carried out in cooperation with a private boat owner under the supervision of a consultant masterfisherman and a fishing technologist of the Ministry of Fisheries. The fishing trials were disappointing from a production point of view; catches were far below the initial expectations. Nevertheless, further trials were recommended to be undertaken in other areas where previous surveys indicated a heavy concentration of demersal fish (BOBP/WP/6).

15. Thus, the Ministry of Fisheries, in association with BOBP, has resumed fishing activities in August 1980 on the east coast and along the north west coast by employing four 3½ tonners on a charter basis. These activities are envisaged to continue through 1981. A national consultant has been engaged full time to assist in the work.

16. Fishing trials with bottom-set gillnets were carried out for three months in cooperation with a small-scale fisherman. The large-mesh gillnets (6") provided by BOBP proved to be efficient in catching large-sized commercial species. Efforts will be made to popularise such improved nets.

17. The Ministry accords a high priority to the demersal fishing project and national input is considerable.

18. Fishing Gear Improvement (SRLIFGI)

To upgrade the large-mesh driftnet fishery by demonstrating the use of more appropriate fishing gear materials (lower investment costs, higher catching efficiency) in Sri Lanka.

19. Fishing trials, undertaken since February 1979 in cooperation with private fishermen, showed that nets of thinner PA twine (21 ply) cost less money and catch more fish than nets of thicker PA twine (27 ply) ; and that polypropylene (PP) is as effective as Kuralon (PVA) for framing ropes and costs much less (ref. BOBP/WP/3).

20. It was agreed that these findings needed dissemination. BOBP cooperated with the Ministry of Fisheries in publishing an extension leaflet for fishermen in Sinhala and Tamil. (The leaflet is now under print). Meetings were also organized with extension officers and with suppliers and manufacturers of fishing gear.

21. Fishing trials with polyethylene driftnets were being carried out since July 1980 in cooperation with a private fisherman/boat owner. Initial trials with polyethylene (PE) monowire twisted and fibrillated (\$ 1 .00) driftnets were not successful. Trials with nets of thinner fibrillated polyethylene twine (\$ 0.75) commenced in September and are continuing. Results are encouraging.

22. It is envisaged that this project will be terminated early 1980 since the objectives have been achieved and only marginal improvements can be expected by further experiments.

23. Cottage Industry for Net Making (BOB/CIN)

To evaluate the feasibility of manual production of fishing nets.

24. Further to the preliminary work reported last year, manufacturers of netting machines and other appropriate technical institutions all over the world were contacted to obtain information about manually operated braiding machines. No positive response was received. It is believed that the only way cottage net-making can be significantly improved is by devising an intermediate technology product like a manual braiding machine. If this is not possible the project should be discontinued.

25. *Low-cost Net and Line Haulers (BOB/ENG)*

To develop and demonstrate the use of simple net-hauling and line hauling devices.

26. Four different prototypes of haulers -a mechanically driven pedestal type for nets and lines, and three hand-cranked line haulers — have been designed with the assistance of a consultant. Three of the prototypes were constructed in Madras, one in Colombo. All the four prototypes are ready for testing. Most of these tests will be undertaken in Sri Lanka. Suitable haulers have also been acquired from outside the region in order to compare performance and facilitate the adoption of proven ideas using locally available materials and skills.

Other Fishing Gear Methods/Activities

27. Echosounders: Experiments are being undertaken in cooperation with a German manufacturer of echosounders to explore the possibilities of using low-cost flashing-type echosounders in small-scale fisheries. These experiments are being carried out in connection with the demersal fishing project in Sri Lanka.

28. A Consultation on fishing gear and methods was held in Madras, 22-26 September. A report of the consultation is attached, as Annexure I.

Fishing Craft Technology

29. *Fishing Boat Design and Prototype Construction (BGD/FIB)*

To develop suitable fishing boats for the Bangladesh fisheries.

30. It was agreed with the Bangladesh government that this work should be undertaken in cooperation with the DANIDA-supported boatyard of the Bangladesh Fisheries Development Corporation (BFDC). At present, the boatyard is building a series of small coastal trawlers. Discussions were held with BFDC/DANIDA, and outline specifications of a 13-metre trawler were agreed upon. Since a boat of this size cannot be considered a small-scale fisheries boat, the BOBP will not be directly engaged in the construction of these boats. A decision on DANIDA support has also not yet been made.

31. The prospects for introducing small fishing craft in Bangladesh are not very good, since the delta area is already heavily exploited. To be economic, the new craft would need an extended fishing area and season. The most promising fishing method to push production appears to be trawling. The possibilities of employing boats of modern design, say about 35 feet long, may be worth exploring. They can be used for pair trawling during fair weather periods and also for other fishing operations as single units. BOBP is suspending further action on this activity until the BFDC takes a final decision on the type of boats it will construct.

32. *Motorization of Country Craft (BGD/MCC)*

To investigate the feasibility of motorizing traditional fishing craft in Bangladesh.

33. A project has been prepared which will test the feasibility of using "longtail" type engines on the "Chandi" boats common in the estuarine waters of Bangladesh. Engine specifications and installation details have been prepared, and four engines from two different manufacturers, besides fishing gear, have been ordered. The trials are likely to commence in November 1980. BFDC is the cooperating agency and has arranged for the charter of the Chandi boats. The Swedish Free Mission is to provide assistance in the repair and maintenance of the engines. The project will be located at Bhola. The trials will continue for at least one winter season,

34. Beach Craft Development (IND/BCD)

To develop a suitable small craft which can be operated from open beaches under moderate-to heavy surf conditions along the east coast of India.

35. Four prototype boats have been constructed. Two of the boats are displacement mono hulls; the third is based on the kattumaram principle with polystyrene blocks providing the buoyancy; the fourth is of the twin hull type. The first three are motorized by a small (4.5 hp) inboard diesel engine and the twin hull craft is propelled by a (6 hp) outboard engine. All the craft are equipped with sails.

36. The prototypes were tested during a period of six weeks at a fishing village near Madras in light-to-moderate surf conditions. Two of the prototypes — one of the two displacement mono hulls, and the buoyancy-block boat—were found technically feasible and will undergo commercial fishing trials (Ref. BOBP/WP/7). These two prototypes have been sold at a subsidized price to the fishermen who participated in the trials and they are now being used in commercial fishing. Three new boats, of the single hull displacement type, have been built for further tests and fishing trials in Andhra Pradesh.

37. Good progress has been made towards the solution of the beachcraft problem. Specific achievements relate to the design of the craft, the watertight box in which the air-cooled engine is installed and the arrangements by which the shaft and propeller can be lifted up into a tunnel in the hull while on the beach or touching the beach. Further design or development work will depend on the results of the fishing trials in Andhra Pradesh — which commence in October and will go on for several months.

38. Kattumaram Improvement (IND/KAT)

To investigate the possibilities of increasing the productivity and profitability of kattumaram fishing in India.

39. A five-log kattumaram has been procured and two of the logs have been pressure-treated. The kattumaram has just been put into commercial operation at the end of the reporting period. Deterioration of the treated and non-treated logs will be observed and compared. Attempts to obtain alternative and cheaper wood species from the Andaman Islands were unsuccessful.

40. The inventory of the kattumarams of Andhra Pradesh and Tamil Nadu, major work for which was completed last year, has been finalized and the report is expected to be ready at the very end of this reporting period (BOBP/WP/2).

41. The progress of this project has been slower than planned, and there is no particular achievement to record. Reasons: first, priority for programme staff and consultants was accorded to the beachcraft development project; second, there was hardly any counterpart input; third, the problems in obtaining logs from the Andamans.

42. Beachcraft Development (SRL/BCD)

To develop a suitable low-cost craft to be operated by small-scale fishermen in Sri Lanka.

43. Three different craft have been constructed and tested. One is a 7-metre boat built at the CEYNOR boatyard in Colombo. It has a strip-planked bottom and marine plywood sides. Initially, an attempt was made to install a low powered engine (5 hp) as in the Indian beach prototypes. However, this power was found to be insufficient, and as an interim measure, a 15 hp outboard engine has been used for propulsion during tests. The boat has been received well by the fishermen; it has a good load carrying capacity and is comfortable at sea. The fuel consumption of the outboard engine, however, is prohibitively high and arrangements are now being made to obtain a 12 to 15 hp air-cooled inboard diesel engine. The installation of engine and stern gear will be nearly identical to the system used for the beach landing prototypes in India. Adequately powered, the boat is likely to be a good beachable alternative to the present boats. Intensive trials will be undertaken with the new engine installation.

44. The second craft tested is a twin-hull fibreglass craft with a bamboo platform connecting the two hulls. The craft is made for sailing with provision for an auxiliary outboard engine. It was put to use in a fishing village on the east coast, and apart from some suggestions to modify the hull, the craft was well received. It will be tested further in connection with the extension project in Batticaloa.

45. A third type of craft is a trimaran using one of the hulls from the twin-hull craft, with two outrigger floats. The craft is very slender, and can move fast with low power. It was put to use in a fishing village on the east coast, and apart from some suggestions to modify the hull, the craft was well received. It will be tested further in connection with the extension project in Batticaloa.

46. The progress of the Sri Lanka beachcraft development project has suffered from inadequate counterpart staff input. Delays in the construction of the craft and shortcomings in the trials could have been avoided if suitable counterpart staff had been assigned to the project.

47. *Inboard Motorization of Small FRP Boats (SRL/IBM)*

To demonstrate the use of small light-weight fuel saving diesel engines in FRP boats in Sri Lanka.

48. The installation of the engine and technical trials were completed early in the year (ref. BOBP/WP/4), and the boat was handed over to the Ministry for test and demonstration fishing. The installation demonstrated the technical feasibility of installing a small inboard engine in that particular type of boat. The earning capacity of the boat would be the same as that of a hull propelled by an outboard engine: the difference in economics will only relate to the capital and running costs of the two different types of engines. Because of the high fuel consumption of the outboard engines, there are clear economic advantages in the use of diesel inboard engines wherever possible.

49. As in the case of Sri Lanka beachcraft development, this activity too has suffered from inadequate counterpart staff input. No further activities will be undertaken under this project but the concept of using low-fuel consumption engines will be promoted continuously through the beachcraft development project.

50. *Reinforced Vulcanized Rubber-RVR Boats (BOB/RVR)*

To investigate the technical and economic feasibility of RVR construction for small craft

51. Different methods of construction using rubber material have been investigated. The first method, by which a couple of small boats had been constructed in Sri Lanka, had to be abandoned because of corrosion problems. This method utilised a steel mesh between two laminated layers of rubber. The water cannot be completely kept out, and the steel mesh corrodes quickly. There is also the danger of fatigue because of the high flexibility of the construction.

52. Another possible method would be the technique used when producing tyres. However, in this case the entire hull would have to be put into an enormous autoclave and a pressure of 80 kg/cm² would have to be applied at high temperature. This might be technically possible but it would require a very high capital outlay and no rubber manufacturer has ever attempted such a venture. The third possible solution would be to cover a metal or wooden frame with a conveyor belt type rubber sheet — a technique similar to that used in building boats of plywood. Such belts are commercially available with synthetic reinforcement and have very high abrasion resistance. However, in addition to being expensive, this method would depend on a strong internal frame of metal or wood adding to the weight; there will also be problems in gluing the rubber on to the framing.

53. Worldwide enquiries have been made regarding the construction of RVR boats, but no positive response has been received. It is therefore concluded that the construction of boats

using RVR as originally envisaged is not likely to be feasible, and that a solution will require extensive research and development work. In this context too, the response from rubber manufacturers and research institutes has not been very enthusiastic. It is therefore suggested that this project be discontinued.

54. Boatbuilding Materials (BOB/BBM)

To study the availability and cost of traditional boat building materials in relation to novel materials such as FRP and ferrocement.

55. A consultancy firm from India was engaged to gather information on the availability and the costs of materials such as wood, plywood, ferro-cement and aluminium used in India for building small craft. The information has been analysed by project staff and consultants and presented in a working paper, BOBP/WP/9. The analysis concludes that ferro-cement is not a suitable material for small craft construction and that none of the other materials is superior to the others in terms of total cost over the lifetime of a fishing boat. The wood, plywood, and FRP materials vary slightly in costs, often depending on duties and taxes. A matter of concern, though, is that the wood prices seem to have risen at a much faster rate than the prices of other materials.

56. No further activities are suggested for the time being. But the feasibility of using aluminium as a material for boats that require a light construction — beachlanding craft — might be worth investigating.

Other Fishing Craft Activities

57. A Consultation on Fishing Craft Technology was held in Madras 13-17 October 1980. A summary report is attached as Annexure 2.

Fish Utilisation

58. Fish Collection and Distribution System (BGD/CDS)

To demonstrate an improved system of fish collection for the Dubla Char fisheries in Bangladesh.

59. This is a follow-up of the pre-feasibility study for a floating fish receiving and distribution unit that was undertaken at the end of 1979. The outcome of the study was that such a unit would be neither economically nor technically viable. The mission that undertook the study suggested an alternative project using collection and carrier vessels. The matter has been discussed with the fisheries authorities, and it is agreed that in order to launch a meaningful project, full cooperation from the various parties involved in the catching-distribution chain will have to be secured. Efforts to this effect have been made but without conclusive results. At the time of reporting it appears that the assumed prerequisites for a successful venture cannot be attained.

60. Training Courses for Fish Marketing Personnel (IND/MAR)

To impart training in marketing management and related subjects to middle level officers of marketing organizations in India.

61. The first course was conducted in Madras for two weeks in December 1979 for 21 participants from Tamil Nadu. The course is built around a "Business Game" developed by the White Fish Authority (UK). Details of the course are set out in Report BOBP/REP/9.

62. At the request of the Directorate of Fisheries, Andhra Pradesh, a second course will be conducted in November 1980 for about 20 participants, mainly from the Andhra Pradesh Fisheries Corporation (APFC). This course has the basic components of the previous one, but has been specially tailored to the needs of the APFC.

63. Fresh Fish Handling (IND/FFH)

To demonstrate the use of ice for fish preservation in insulated boxes on board fishing boats in India.

64. The project started in the second half of 1979 in Chandipur, Orissa. Fifty insulated boxes were made available by BOBP for distribution to traditional fishing craft. The Programme also provided ice and handling services for the boxes free of charge. Despite these BOBP inputs, only 10-12 boxes could be put to use by the fishermen. Winter 1979 was a poor season for hilsa -one factor responsible for the low utilisation of the boxes. No conclusive results were obtained. For the 1980 season, a national consultant was engaged for on-the spot monitoring of the project. The difficulties in utilizing the boxes continued. Serious problems in securing a regular supply of ice were also experienced. Further, fishermen were reluctant to take the boxes on board since they did not see the benefits; the fishing is carried out very close to the coast and there is no clear deterioration in the quality of the hilsa. The second fishing season too failed to produce any positive results.

65. During the experiments, a cooperative employing motorized boats (about 30 feet long), showed keen interest in the project. These boats go further out fishing and depend on the tide to enter the landing centres. The fish is therefore usually kept for longer periods on board and the need to preserve the fish is more apparent. It has therefore been decided to transfer the boxes to the Rajlaxmi Fishermen's Cooperative Society, Chandipur on the condition that reports about their use will be submitted to the Programme.

66. A report of the activities undertaken to date is under preparation and the reason for the unsuccessful trials will be analysed. There seem to be two reasons: (a) wrong assumptions about the potential benefits and (b) weak counterpart input in executing the project.

67. Fish Drying Technology (IND/FDT)

To demonstrate improved solar drying techniques in India by use of racks and polyethylene tents.

68. A project site — Nuwalarevu in Srikakulam district, Andhra Pradesh — has been selected, and a project description prepared. Arrangements have been made for local manufacture of drying racks, for participation by fisherwomen in the drying activities, and for local monitoring and supervision. The project is behind schedule. One reason is that the movement of polyethylene tents from the Calcutta supplier to the project site was affected by floods. The project will hopefully start in November.

69. Village Fish Receiving and Distribution Unit (IND/VFU)

To demonstrate the use in India of appropriate facilities to improve the quality, and thereby the price of fish by better handling, storage, preservation and distribution.

70. At the request of the Fisheries Department of Tamil Nadu, the earlier decision to site the activity at Punnakkayal was reconsidered and Adhiramapattinam in Tanjavur District was selected. A project outline has been prepared. Preliminary surveys- concentrating on the socio-economic characteristics of the village and of required technology inputs- have been undertaken. Although the main purpose remains, several other aspects, both technical and social, are being added, and the project is taking on the shape of an integrated village extension project with the cooperation and active participation of the villagers and of local and state authorities.

Coastal Aquaculture

71. Coastal Aquaculture (BGD/CAC)

To establish a demonstration centre for shrimp culture at Cox's Bazar, Bangladesh.

72. A project preparation mission was fielded in November/December 1979. Its outcome was a project proposal with two components : a pilot project to involve traditional fishermen in shrimp farming, and the developing of an extension and experimental centre for shrimp culture. In subsequent discussions with the Government it was agreed that the first part (a pilot project to involve fishermen) may not be feasible at this stage; and that the second part-the demonstration centre -should be considered for implementation.

73. As an advance component of the project, three Bangladesh fishery officers are to be given fellowships for training in shrimp culture at the Central Marine Fisheries Research Institute, Cochin, India. One of the officers will receive further practical training in pond engineering in the Philippines. The selected officers have been assigned to shrimp culture work and they will, on the completion of the training, serve as full-time counterpart staff of the project.

74. Aquaculture Demonstration of Family Size Units in Ban Merbok, Kedah state, Malaysia (MAL/CAC)

To establish a pilot-scale brackish water aquaculture project in Malaysia.

75. The project will demonstrate the potential of shrimp pond farming in six four-acre farm units, and assist in the designing of a hatchery and in the training of officers, extension workers, fishermen and farmers. Implementation was due to commence in January 1980. There was however, a delay of about six months because the site selected earlier for the demonstration ponds had to be reconsidered. Consequently, only pre-project activities, including training, were undertaken during the major portion of 1980, and work on the development of premises commenced only during the last quarter of the year.

76. Aquaculture Demonstration for Small-Scale Fisheries Development – Phang Nga (THA/ACD)

To demonstrate ways of improving incomes and living standards at the village level through an integrated pilot-scale project in Thailand.

77. Demonstration of aquafarming techniques : The demonstration of cockle culture in one of the villages was successful; the Phang Nga provincial government has now approved funds (\$90,000) for a major commercial cockle culture project. In green mussel culture, the stock has grown to marketable size, but is being maintained as breed-stock without harvesting until sufficient spat is collected. Oyster culture is in progress at two locations and arrangements are being made for spat collection. The initial work on cage culture of fin-fish suffered a setback due to scarcity of fry and lack of know-how on the nursing of fry and on cage construction. Presently, however, satisfactory progress is being observed with 1,400 grouper fingerlings stocked in cages and 9,000 seabass fry stocked in nursery cages.

78. Village infrastructure facilities : The construction of a rainwater storage tank in one of the five villages was subject to considerable delays due to difficulties in transporting materials and supplies and lack of fresh water for use in construction. Work is in progress. Arrangements are also being made for the construction of a well, tank and windmill pump in another village for supply of fresh water to a number of villages.

79. Training : The women's component included several training courses- one on simple village-level fish processing methods, and a series of courses on improvement of shrimp paste quality. A handicrafts training course was conducted late 1979; this year a handicrafts study tour of the Philippines was sponsored for three persons. Other training provided through the project included a short course on the operation of a village-level nursery for sea bass fry, an aquaculture study tour for village fishermen, and an aquaculture study tour of Japan, Hong Kong, Singapore and Malaysia for the project's team leader and technician.

Other coastal aquaculture activities

80. The Programme is exploring the possibilities of a TCDC mission, under which fisheries personnel from Indonesia will prepare a project for the development of coastal aquaculture in Andhra Pradesh, India.

81. The Programme sponsored an observation tour of brackish water fish pond farming in Thailand and Singapore for a six-man team from Sri Lanka, consisting of four small-scale fish farmers, an aquaculturist from the Ministry of Fisheries and a bank official concerned with agricultural credit. The team was provided with orientation on the management and operation of brackish water fish farms in the two countries.

82. At the request of the Ministry of Fisheries, Sri Lanka, the Programme is making TCDC arrangements for the release of two officers of the Tamil Nadu Directorate of Fisheries to help design and implement an experimental shrimp farm project in Sri Lanka.

83. The Programme sponsored the participation of four scientists from Bangladesh, Malaysia, Sri Lanka and Thailand in a symposium on coastal aquaculture conducted in January at Cochin by the Marine Biological Association of India.

Extension Services

84. Marine Fisheries Extension in West Bengal (IND/XWB)

To plan for a systematic extension service for marine fisheries in West Bengal, India.

85. A project outline has been prepared. A preparatory study of 10 landing sites is being conducted at the end of the reporting period. A socio-economic survey may be carried out next year; since marine fishing activities are only carried out during the four winter months, and fishermen migrate during that period from their home villages to temporary settlements, it is necessary to survey both landing sites and home villages. Progress of this project has been hampered by the delay in assignment of counterparts.

86. Extension training – Orissa (IND/XOR)

To develop the technical capability of 30 newly recruited extension officers to implement an extension programme for improving the fishing craft and gear of marine small-scale fishermen in Orissa, India.

87. The project provides for a field study of traditional craft and gear by a local fisheries expert in association with the extension staff, and the formulation of an extension work plan based on the findings of the study. The capabilities of the extension staff are to be strengthened in many ways-by providing them with sea experience in local fishing boats; orientation in artisanal fishing operations in Sri Lanka under a TCDC arrangement with a private sector agency; specialised training for a limited number of officers, as required; and on-the-job training. Technical guidance and direction, training facilities and supplementary inputs such as fishing gear, equipment and prototype fishing craft developed in other projects are to be provided by BOBP.

88. The field study of fishing craft and gear has been completed. An initial batch of six officers is acquiring sea experience; they are due to undergo orientation in artisanal fishing in Sri Lanka in November. There has been a time lag of about three months in the schedule due to procedural delays in the grant of formal approval and clearance at state and central governmental levels,

89. Extension Training – Sri Lanka (SRL /EXT)

To develop a new approach to beach-level technical extension work by utilising and upgrading the capability of the technical staff of the Batticaloa Fisheries Training Centre, Sri Lanka.

90. The approach will be tested in seven fishing villages of Batticaloa district in which the training centre staff, working as a mobile extension unit, will, in close consultation with the fishermen, and with technical guidance from BOBP staff, prepare and implement an extension work plan to provide technical support services to the fishermen. BOBP will further provide motor cycles, fishing gear, prototype craft, engine tool kits and funds for workshops/study tours. The expected outcome is a methodology for technical extension work replicable elsewhere in

Sri Lanka through the other training centres and through on-the-job training for the concerned staff.

91. A data survey to gather base-line information on the existing fisheries situation in each village is in progress. An initial six-month extension work plan is under preparation. Promotion of supplementary income-earning activities by the village families is being considered for inclusion in the work plan.

92. Female Resources Development in the Fisheries Sector (SRL/WOM)

To formulate an action programme for the improvement of women's economic and social skills that contribute to the betterment of the small-scale fisheries family/community in Sri Lanka.

93. The Women's Bureau of Sri Lanka has been subcontracted to survey the present status and role of women in selected small-scale fisheries communities, and to identify needs and available resources. The study will form the basis for specific recommendations on possible future projects. The Programme is committed to sponsor follow-up action starting early 1981.

Other extension service activities

94. The programme cooperated with SEAFDEC by providing supplementary funding for a project to identify marine fisheries training needs in five South-East Asian countries. The purpose of the project is to determine the requirements for exchange visits between fisheries personnel and the conditions under which fisheries training facilities could be made available for the training of non-nationals.

Fishery Resources

95. Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal (BOB/STA)

To review the current status of stock assessment of the coastal fishery resources in the Bay of Bengal region; to consider the requirements for development and management; and to identify problems and priorities for action needed in the areas of resource assessment, development and management.

96. Fisheries scientists from all the participating countries attended the consultation, which was held in Chittagong, Bangladesh in June. A paper on the status of stock assessment was contributed by each country. The outcome of the consultation was a better knowledge of the exploited and exploitable fish resources of the shelf area of the Bay of Bengal, and a consensus on the measures needed to solve the problems encountered and to achieve proper development/management of coastal fishery resources. The outcome of the consultation has been published in BOBP/REP/10.1 and BOBP/WP/8; BOBP/REP/10.2 is under print.

97. Since stock assessment is not a major component of the BOBP, follow-up activity by BOBP has necessarily to be marginal and will relate mainly to dissemination of information. Major work is expected to be a function of the Bay of Bengal Committee and its specialised support programmes for fisheries development and resource monitoring.

Other fishery resources activities

98. Conference on Fish Resources of Sri Lanka: The Development Adviser took part in a Ministry of Fisheries/NORAD conference on fish resources of Sri Lanka, August 26-27, held as a follow-up to the Fridtjof Nansen surveys in Sri Lanka waters.

Other Topics

99. In accordance with the recommendation of the 4th AC meeting, the Programme has made an attempt to further promote TCDC activities in the region. A consultant has been engaged to visit the participating countries and the South China Sea Programme to hold discussions

with senior officials of the administrations concerned. A summary report is presented in document AC5/8, "TCDC possibilities".

100. BOBP sponsored the participation of senior fishery officials in the IPFC Symposium on Management and Development of Small-Scale Fisheries held in Kyoto. The Programme Director also participated and assisted in the conduct of the Symposium, and attended the 19th Session of the IPFC.

Information Service

101. This year the information service was primarily engaged in putting out technical literature resulting from the BOBP's activities in the form of attractive, readable publications, and sending it to an appropriate mailing list of recipients within and outside the region. Seven reports, ten working papers and one miscellaneous paper were issued in 1980. These publications were sent to more than 300 people (scientists, researchers, officials, librarians) -about 240 from the Bay of Bengal region and FAO, about 70 recipients from 18 countries outside the region. The mailing list is reviewed and revised periodically.

102. Non-technical literature : A "primer" of basic facts about the BOBP was first issued in January 1980 and revised twice. An extension leaflet for Sri Lanka fishermen explaining the findings of the BOBP's large-mesh driftnet improvement project is under print. The first issue of a newsletter — Bay of Bengal News -focussing mainly on the activities of BOBP but also reporting briefly on development projects concerning small-scale fisheries in the region, is under preparation.

103. Media publicity: A press conference on May 2, 1980 generated significant coverage in leading Indian newspapers such as *Hindu*, *Hindustan Times*, *Indian Express* and *Economic Times*, and a 15 minute television feature. The beachcraft trials at Ennore were also televised, and figured in a five-minute television bulletin. Reports or articles about BOBP activities have appeared occasionally in the Sri Lanka and Bangladesh press and quite regularly and prominently in *Fishing News International*.

104. Photographs and slides: The BOBP's collection of photographs and slides is gradually building up, and is presently being classified. A slide show introduction to BOBP will be possible in the not-too-distant future.

105. Library: The BOBP library's holdings include about 1,000 FAO reports and some 1,500 other publications (books, reports and reprints). The BOBP subscribes to about 25 journals within and outside the region and receives 37 journals on a complimentary or exchange basis. Contacts for information exchange have been established with fisheries research institutions, government agencies and libraries.

PROJECT INPUTS

106. The financial inputs available to BOBP for the second year of operation, including savings from the first year, have been utilized to the order of 75%. As per the FAO financial statement, the commitments incurred amount to about 90% of the inputs, but this includes some commitments already incurred for 1981 plus 1980 commitments which will not be fully utilised because of delays in implementation. The major areas not fully utilised are personnel services and contractual services. Estimated expenditures under different headings are given in Table 1.

107. All professional staff posts provided for in the budget as revised after the 4th Advisory Committee Meeting and the subsequent FAO/SIDA Annual Review Meeting, have been filled during the year (Table 2). However, the recruitment of the Sociologist (Women Officer) was delayed by eight months and that of the Fisheries Engineer by two months. The present Fish Utilisation Specialist is leaving in November and the post will be refilled as soon as a suitable incumbent can be recruited by FAO.

108. The requests for Associate Experts have resulted in four incumbents at post at the time of reporting (Table 2). They are from Germany FR (2), Netherlands and Sweden. BOBP has

received no response to the requests for Associate Experts in the fields of Fishing Craft and Fish Utilisation. Funding for the Associate Experts, including travel costs, is by the respective donor Governments.

109. It has not been possible to fill any INSTA posts. INSTA (In Service Training Awards) are fellowships for young professionals from developing countries and are funded by a special FAO Trust Fund (Netherlands). Several nominations were received from the participating countries after considerable delays. By that time the 1980 funds for the scheme were exhausted. No indication has been received of INSTA possibilities for coming years.

110. The number of consultant man months provided for in the budget has been exceeded, thereby compensating somewhat for the below-budget expenditure on Programme staff (Table 3). For implementation of the various projects, 13 international and five national consultants have been engaged. Furthermore, four FAO headquarters officers and two national officers have assisted in the Programme's implementation on a deputation basis — i.e. only travel cost and subsistence allowance were charged to the Programme.

111. The recruitment of supporting staff as agreed in the FAO/SIDA Annual Review has been completed during the year.

112. Programme staff have travelled extensively in connection with the planning, execution and monitoring of the many projects. The number of days spent on duty travel last year by the international Staff vary from 97 to 135.

113. The Programme has continued, to the best possible extent, to utilise national organisations and institutions—both public and private—for implementation of activities. This is being done through formal FAO contracts wherever necessary and otherwise on a casual and informal basis. A list of the agreements in force during the year is provided in Table 4.

114. Major items of equipment, materials and supplies for the Programme have been employed for projects concerning fishing gear and methods and fishing craft technology, and for the Madras office (vehicles received last year but charged this year).

115. The training component of the Programme has been utilised as follows: 46 persons have participated in consultations and seminars in different subjects; study tours concerning fishing operations, handicraft and aquaculture — ranging in duration from one week to two months — have been sponsored for 48 persons; three fellowships in aquaculture, of three-month duration, are expected to commence before the end of the year; about 100 villagers have been given short term training, 75 in fish processing and 30 in aquaculture, in connection with the Phang Nga project; some 20 middle level officers were given training in fish marketing in India for about two weeks. Details are provided in Table 5.

116. The counterpart inputs to the different projects vary considerably with the type of project : some of them do not require any substantial financial input, Notable inputs are for the Programme headquarters and for the two boat trawling projects in India; the domersal fishing project in Sri Lanka ; the aquaculture project in Malaysia ; and the Phang Nga project in Thailand.

Table 1
1980-BUDGET AND ESTIMATED EXPENDITURE - GCP/RAS/040/SWE
(As per FAO financial statement, September 1980) (In US \$)

| Codes | Object of Expenditure | Budget | Estimated | | Balance |
|------------|------------------------------------|-----------|------------------------|--------------------------|----------|
| | | | Expenditure up to 30.9 | expenditure up to 31 .12 | |
| *10 | Personnel Services | 663,200 | 331,437 | 569,468 | 93,732 |
| *20 | Duty Travel | 104,500 | 64,541 | 126,684 | (22,184) |
| *30 | Contractual Services | 261,500 | 25,410 | 147,261 | 114,239 |
| *40 | General Operating Expenses | 72,500 | 31,486 | 54,130 | 18,370 |
| *50 | Supplies and Materials | 134,500 | 52,527 | 114,093 | 20,407 |
| *60 | Furniture and Equipment | 114,500 | 72,108 | 153,121 | (38,621) |
| *80 | Fellowships, Grants, Contributions | 105,500 | 16,456 | 151,854 | (46,354) |
| | Sub-total | 1,456,200 | 593,965 | 1,316,611 | 139,589 |
| *90 | Project Servicing Cost | 203,868 | 83,170 | 203,868 | — |
| | Grand Total | 1.660.068 | 677,135 | 1,520,479 | 139,589 |

* Includes some outstanding commitments for staff for 1981

Table 2
1980 — PROFESSIONAL STAFF - GCP/RAS/040/SWE

| S.No. | Post | Name of Incumbent (Nationality) | Date of | |
|----------------------------|--|------------------------------------|---------|-----------|
| | | | Arrival | Departure |
| International Staff | | | | |
| 1. | Programme Director | Engvall L.O. (Sweden) | 11/78 | |
| 2. | Development Adviser | Pietersz V.L.C. (Sri Lanka) | 1/79 | |
| 3. | Fishing Technologist | Pajot G. (France) | 1 /79 | |
| 4. | Fishing Craft Specialist | Ravikumar R. (India) | 9/79 | |
| 5. | Fish Utilization Specialist | Nathan M.T. (India) | 2/79 | 11/80 |
| 6. | Fisheries Engineer | Overa A. (Norway) | 9/80 | |
| 7. | Sociologist (Women Officer) | Patchanee (Ms.) N. (Thailand) | 8/80 | |
| 8. | Fishing Technologist (Ass. Expert) | Bergstrom M. (Sweden) | 10/80 | |
| 9. | Extension-Sociologist (Ass. Expert) | Blase F.W. (Netherlands) | 12/79 | |
| 10. | Socio-Economist (Ass. Expert) | Drewes (Ms.) E. (Germany FR) | 10/80 | |
| 11. | Economist (Ass. Expert) | Tietze U. (Germany FR) | 10/80 | |
| 12. | INSTA fellows | | | |
| National Staff | | | | |
| 13. | Information Officer | Madhu S.R. (India) | 10/79 | |
| 14. | Administrative Officer | Sivaraman N. (India) | 4/79 | |
| 15. | Project Officer - Bangladesh | Kashem A. (Bangladesh) | 11/79 | |
| 16. | Project Officer - Sri Lanka | Perera B.W. (Sri Lanka) | 8/79 | |

Table 3
1980-CONSULTANTS - GCP/RAS/040/SWE

| S.No. | Name | Nationality | Project | M/M |
|--|---------------------|-------------|------------------|------|
| <i>International Consultants</i> | | | | |
| 1. | Crockett, J. | U.K. | IND/TBT, BGD/FMD | 7.8 |
| 2. | Juliusson, H. | Iceland | SRL/DEF | 3.0 |
| 3. | Mutton, B. | U.K. | BOB/ENG | 0.7 |
| 4. | Saevik, O. E. | Norway | BGD/FMD | 2.6 |
| 5. | Gowing, G. P. | Australia | IND/BCD | 2.25 |
| 6. | Gulbrandsen, f | Norway | IND/BCD | 3.0 |
| 7. | Tong, N. | Thailand | BGD/MCC | 2.0 |
| 8. | Doe, P. | Australia | IND/FDT | 0.5 |
| 9. | Haywood, K. H. | U.K. | IND/MAR | 1.0 |
| 10. | Nicholson, R. J. A. | U.K. | IND/MAR | 1.0 |
| 11. | Antony Raja, B. T. | India | BOB/STA | 3.0 |
| 12. | Eddie, G. | U.K. | INF | 0.5 |
| 13. | Nichols, E. H. | U.K. | TCDC | 1.5 |
| <i>National Consultants</i> | | | | |
| 1. | De Bruin, H. P. | Sri Lanka | SRL/DEF | 3.5 |
| 2. | Ramamoorthy, P. V. | India | IND/TBT | 10 |
| 3. | Varadarajan, B. | India | IND/BCD | 2.0 |
| 4. | Ramanandan, R. | India | IND/FFH | 4 |
| 5. | Artachinda, A. | Thailand | THA/ACD | 0.8 |
| <i>FAO HQ Consultants on Deputation</i> | | | | |
| 1. | Scharfe, J. | FAO | FGM | 0.5 |
| 2. | Gurtner, P. | FAO | FVT | 0.5 |
| 3. | Ruckes, E. | FAO | IND/MAR | 0.5 |
| 4. | Ayazi, R. | FAO | MRM | 1.5 |
| <i>National Consultants on Deputation</i> | | | | |
| 1. | Menon, T. R. | India | IND/TBT | 1 |
| 2. | Chakraborty, P. K. | India | IND/FDT | 1 |

Table 4

**1980-COOPERATION AGREEMENTS WITH NATIONAL ORGANIZATIONS/
INSTITUTIONS - GCP/RAS/040/SWE**

| S.No. | Project | Name of Organization | Services |
|--------------|----------------|--|---|
| 1. | IND/BCD | A.P. Fisheries Corporation Kakinada | Construction of a 7.00 metre beach landing boat |
| 2. | IND/BCD | Aquamarine Private Limited Madras | Construction of 2 nos. 7.00 metre beach landing boats IND-11. |
| 3. | IND/BCD | Indian Sea Crafts, Madras | Construction of 4 nos. beach landing crafts. |
| 4. | SRL/BCD | Ceynor Foundation, Colombo Sri Lanka | Construction of 7 metre beach landing craft. |
| 5. | IND/BCD | Fishermen, Tamil Nadu/ Andhra Pradesh | Testing of beach landing craft. |
| 6. | SRL/BCD | Mr. Warunasri, Fisherman Ambalangoda, Sri Lanka | Testing of beach landing craft |
| 7. | BOB/BBM | Matsyasagar Consultancy Services | Study on boatbuilding materials |
| 8. | BGD/FGI | CARITAS and Kalidaha, Bangladesh | Providing boats for fishing trials. |
| 9. | BGD/FGI | Various fishermen Bangladesh | Providing boats for fishing gear experi- ments |
| 10. | BGD/FMD | Swedish Free Mission Bangladesh | Trawling experiments. |
| 11. | SRL/DEF | Lion Trawlers Industries Ltd., Sri Lanka | Providing 38-ft. GRP boat for bottom- longlining trials. |
| 12. | SRL/DEF | Various fishermen, Sri Lanka | Providing boats for demersal fishing trials. |
| 13. | SRL/FGI | Various fishermen, Sri Lanka | Providing boats for fishing gear experi- ments. |
| 14. | IND/FFH | Messrs. Marine Traders, Orissa | Handling of fish boxes. |
| 15. | IND/FFH | Various fishermen, Orissa | Using fish boxes on board their boats. |
| 16. | IND/XOR | Youth Fisheries Training Centre, Thalahoma, Negombo | Conduct of courses on fishing for exten- sion officers from Bangladesh and Orissa. |
| 17. | SRL/WOM | Women's Bureau, Sri Lanka | Survey of fishing communities and the present role of women's involvement. |

Table 5
1980 -TRAINING ACTIVITIES - GCP/RAS/040/SWE

| Subject | Dates/ Duration | Venue | Number of Participants | | | | |
|--|--------------------|-------------|------------------------|-----|-----|-----|-----|
| | | | BGD | IND | MAL | SRL | THA |
| 1. Consultations /Seminars etc. | | | | | | | |
| 1.1 Aquaculture symposium | 12-18 Jan. | Cochin | 1 | — | 1 | 1 | 1 |
| 1.2 IPFC symposium | 21-30 May | Kyoto | 2 | — | 2 | 3 | 2 |
| 1.3 Stock assessment consultation | 16-21 June | Chittagong | 5 | 3 | 2 | 2 | 3 |
| 1.4 Fishing gear and methods consultation | 22-26 Sep. | Madras | 2 | 3 | 1 | 2 | 1 |
| 1.5 Fishing vessel technology consultation | 13-17 Oct. | Madras | 2 | 3 | 1 | 2 | 1 |
| 2. Study Tours | | | | | | | |
| 2.1 Aquaculture | 1-2 weeks | Asia | — | — | 1 | 6 | 2 |
| 2.2 Small-scale fishing operations | 2 weeks | Sri Lanka | 3 | — | — | — | — |
| 2.3 Small-scale fishing operations | 2 months | Sri Lanka | — | 7 | — | — | — |
| 2.4 High-opening bottom trawling | 1 week | India | — | — | — | 1 | — |
| 2.5 Handicrafts | 2 weeks | Philippines | — | — | — | — | 3 |
| 2.6 Aquaculture | 1 week | Thailand | — | — | — | — | 25 |
| 3. Fellow wships | | | | | | | |
| 3.1 Aquaculture* | 3 months | India | 3 | — | — | — | — |
| 4. Training Courses | | | | | | | |
| 4.1 Fish processing | 1 week | Phang Nga | — | — | — | — | 75 |
| 4.2 Aquaculture | 1 week | Phang Nga | — | — | — | — | 30 |
| 4.3 Marketing | 11-16 Nov. | Hyderabad | — | 20 | — | — | — |

* May not materialise until 1981

5th Advisory Committee Meeting, 3-7 November 1980, Penang, Malaysia

SUMMARY REPORT OF THE CONSULTATION ON FISHING GEAR AND METHODS

1. The meeting was held 22-26 September, 1980, at the BOBP headquarters in Madras. It was attended by technical officers from all the participating countries, a senior officer from FAO headquarters in Rome and Programme staff.

2. The purpose of the consultation was to review the results, performance and scope of the work undertaken by the BOBP in the field of fishing gear and methods, so as to generate ideas and guidelines for (i) dissemination of conclusive results (ii) suitable operational arrangements for ongoing and future activities and (iii) future areas of work in the participating countries.

3. A review of the relative importance, present and future, of different small-scale fisheries gear and methods revealed that in :

Bangladesh: The most important gear are driftnets and *behundi* nets (setbag nets). There are indications from recent, past, and ongoing projects that small boat trawling might be a feasible proposition. A major problem in this regard is the non-availability of suitable boats that can be operated during the monsoon season.

Sri Lanka: The most important fishing gear at present is driftnets, both of small and large meshes. The driftnetfishery has reached a relatively high level of efficiency. For the near future, gear and methods for demersal fishing are likely to be important in view of the under-utilized resources of demersal and semi-demersal fish.

India: Gillnets are the most important fishing gear along the east coast of India. There are prospects for improving gillnets by transferring experience from one area to another and it was felt that improving the catching efficiency of traditional craft should be accorded the highest priority in future.

Malaysia, Thailand: The problems are not primarily to develop fishing gear and methods but to solve the conflicts between different groups of fishermen or sub-sectors employing different gear.

4. In a general discussion on dissemination of results, there was a consensus in the meeting that practical demonstrations with gear at sea are by far the best way of achieving results. Theoretical extension in classrooms and the use of printed material is of limited value. It was also agreed that though the prime purpose is to reach the poorest fisherman, the best way of introducing new technologies is to work through the more progressive fishermen, who usually are not the poorest.

5. The reports on fishing trials with large-mesh driftnets in Sri Lanka and Bangladesh using thinner twine than commonly used were reviewed. The thickness of the twine is probably the most important factor in the gillnet since it determines the cost of the nets, and largely, the catch efficiency. Minor improvements could be achieved by further experimentation with different materials such as monofilament, the use of natural fibres for lower framing lines of the nets, use of low-cost material for floats, etc.. All these are, however, considered to be marginal improvements.

6. The discussion on the demersal fishing trials in Sri Lanka resulted in a recommendation to diversify the gear and to experiment with traps and drop lines. The reason is that the fishing grounds are very small, consisting of rocky patches over which only a limited number of hooks can be set; availability of fish between the patches is close to zero. Another reason is the difficulty in obtaining and storing bait. There were mixed views about the use of gillnets for demersal fishing. It may sometimes be an efficient method but the gear is expensive and in

case of losses has a damaging effect on the environment and fish stocks; it should be used as a last resort. The use of low-cost echosounders is a must in the prevailing bottom conditions.

7. In discussing the fishing trials with high-opening bottom trawls in Tamil Nadu, India, the effectiveness of this type of trawl, from a fish production point of view, was endorsed. However, a cautious approach should be adopted to trawling to prevent interference with traditional fisheries. Another reason for going slow with trawling is the high energy consumption it entails. It is only in cases where other fishing methods are not likely to be feasible that trawling should receive a high priority. It was also suggested that, instead of trawling, more attention should be given to different seining methods with small craft. The behundi (setbag net) fishery in Bangladesh should receive continued attention because of its low (nil) energy requirements.

8. Although net-making is in theory an ideal cottage industry, it was the consensus of the meeting that many other external factors—such as government policies on machine-made nets, imports, subsidies, etc., will effect the feasibility. One should of course look out for opportunities to assist in the hand-braiding of nets but not promote such industry per se.

9. It was agreed that hauling devices always have technical advantages, particularly when the quantity of fish to be handled is large. However, the devices tend to be costly and the economy is the determining factor. For handling, it was suggested that a small hand-operated reel should be promoted. For longlining in deeper waters, the use of haulers would simplify operations, or in some cases make them possible, and they would reduce dangers to the operations. The feasibility of using net-haulers for surface driftnets is doubtful in small-scale fisheries in the area. For bottom-set gillnetting in deeper waters, however, a hauler would be of great advantage and it should preferably be of the girdie type.

10. Small and simple echosounders are seldom useful in detecting demersal fish near the bottom. However, because of the bottom conditions common in the area, with only small patches of rocky grounds on which the fish is concentrated, it is important for the fisherman to locate the patches before starting fishing. The conventional echosounders with paper recorders are not technically suitable for operation in small boats, and other types — e.g. the flashing type — would be worth trying.

11. There was a lively discussion on fish aggregation devices (FAD). These appear to be universally applicable and they are very small-scale fisheries oriented. Rafts or other objects can be anchored at sea to aggregate the fish and small fishing craft can operate in their vicinity. The discussion revealed that there are already several aggregation methods applied in the region and a first step would be to undertake a study of these and see if experience from one area can be applied in another.

12. On mothership operations, the meeting agreed that in theory it is an ideal operation, energy saving and suitable for small-scale fisheries. However, a cautious approach was recommended because of the many difficult organizational problems in making an operation efficient. Bigger entrepreneurs would probably be required to achieve commercial feasibility, but then the benefits would probably not accrue to the many small operators.

13. The availability of information and exchange of information on fishing gear and methods in the area was discussed. The BOBP was requested to assist in collecting such materials and distribute them to technical officers in the region.

5th Advisory Committee Meeting, 4-7 November 1980, Penang, Malaysia

SUMMARY REPORT OF THE CONSULTATION
ON FISHING CRAFT TECHNOLOGY

1. The meeting was held at the BOBP headquarters in Madras, 13-17 October. Technical officers from all the participating countries — Bangladesh, India, Malaysia, Sri Lanka, Thailand — and consultants and staff of the Programme took part.
2. The purpose of the consultation was to review the performance and the scope of the work undertaken by the BOBP in the field of fishing craft technology so as to generate ideas and guidelines for (i) dissemination of conclusive results, (ii) suitable operational arrangements for ongoing and future activities and (iii) future areas of work.
3. *Kattumaram Improvement — India:* The difficulties in improving the kattumaram fisheries were accepted by the consultation. But it was felt that in view of the importance of this fishery along the east coast of India, the subject should receive further and may be intensified attention. Improvements may be secured by treating the logs used for the craft and possibly also by using other wood species; the benefit would be reduction of investment cost/and or increased service life. Other possible areas of improvement included surf-crossing aids, particularly when leaving the beaches. Improved manual (oar) techniques, and the use of towing ropes were suggested. Attention should also be paid to the possibility of developing alternative small craft as a substitute for the existing kattumarams. These would probably be made of materials other than timber, and be of different design, without deviating from the basic principle. However, any such craft with higher carrying capacity would probably be more dependent on external surf-crossing aid devices.
4. *Oru Improvement-Sri Lanka:* The common outrigger canoes, called Oru in Sri Lanka, are considered to be very suitable craft because of their good sailing qualities and relatively good surf-crossing capabilities. They are particularly useful for light capacity fishing with lines and hooks. The rapidly increasing cost of the wooden logs is a matter of concern. Refinements of this craft may be worth considering. Development possibilities include slight modification of design and use of other materials such as strip-planking, plywood, FRP, or even aluminium. The meeting concluded that any definite advantages in adopting a multi-hull configuration for the craft are not apparent and that it would be better to work with the outrigger concept.
5. *Chandi Boats — Bangladesh:* No definite improvement possibilities were identified, but the motorization trials to be undertaken by the BOBP were endorsed and seen as a possible means of improving the performance of this type of craft.
6. *Inshore trawlers — Bangladesh:* Larger vessels are required in Bangladesh to enable operation during the monsoon period. However, the high investment costs of even moderate-sized trawlers would put them out of the reach of any small-scale fisheries operator. Further consideration should therefore be given to the use of smaller craft and their operation for pair trawling. Smaller craft may not be able to negotiate the roughest weather but would have the advantage of being able to operate gillnets or employ other fishing methods when trawling is not feasible because of bad weather.
7. *Gillnetters- Bangladesh:* The absence of good seaworthy boats in Bangladesh has been identified by the BOBP as a constraint in developing small-scale fisheries. On the question of transferring to Bangladesh gillnetters found suitable in other countries of the region, it was concluded that Sri Lanka-type gillnetters would not be suitable in Bangladesh, where the harbour-to-fishing ground distance is in general much greater. Therefore the boats would have to be larger to accommodate the fish and crew for trips as long as one week.
8. *Beachcraft Development — India:* Beachcraft development trials undertaken by the BOBP were endorsed as a possible avenue for improvement. However, doubts were expressed that

the installation of an engine might not be economically feasible and must be proved by the commercial fishing trials to be undertaken. In this connection, it was suggested that the sailing qualities of the beachcraft should receive high attention. It was also suggested that, in spite of the clearly demonstrated benefits of an engine in crossing the surf, other means should be investigated, like improved rowing techniques and towing by ropes. It was noted that the Ennore trials indicated that a mono-hull is superior to a twin-hull for crossing the surf and handling on the beach.

9. *Boatbuilding materials:* On the discussion about the possibilities of using reinforced vulcanised rubber as boatbuilding material, there was a consensus that this material does not appear to be suitable. The only application might be for sheathing of hulls made of wood or other materials. Regarding preferences for any of the most commonly used materials for construction of small fishing craft, i.e. wood, plywood and FRP, it was concluded that it is not possible to state that one material is superior to another. The rapidly increasing prices of wood are a matter for concern and efforts should be made to improve the wooden construction by suitably treating the wood to increase its service life, improving the design to reduce waste, and sheathing of wooden hulls to resist attack by marine borers. Strip planking was also seen as a possible way of reducing the cost of wood construction. As for alternative boatbuilding materials, aluminium was mentioned; it is still very expensive but might be justified, particularly for beachlanding craft where the weight factor is of crucial importance. In contrast with materials like wood and FRP, aluminium has value as scrap material after the boat has completed its useful life. Finally, it was also submitted that novel materials that increase the service life of the craft are expensive and usually require financial assistance.

10. *Motorization:* The consultation agreed that there is a tendency to overpower fishing boats and that it is very difficult to convince the fishermen and operators about the benefits of reducing the power. Wherever governments grant subsidies or operate incentive schemes for investment in fishing craft, special incentives to low-powered engines may be considered. However, before doing this on a massive scale, it may be necessary to obtain adequate cost and earnings data. On the issue of motorization, different views were expressed at the meeting, but the conclusion was that although fishing craft should ideally rely on sailing power, a blanket recommendation to this effect is not realistic.

11. *Sailing improvements:* The meeting concluded that there are two areas in which the sailing of existing fishing craft can be improved — i.e. improved sailing cloth and improved sailing rig. The former offers some distinct possibilities, while the possibility of improving the rig is uncertain. The purpose of any improvement in sailing should be to make the craft a better economic unit, and not to improve the sailing per se. In order to achieve this, careful studies would have to be undertaken about the fisheries and the operational pattern.

12. *New sailing boats:* On the subject of introducing novel sailing boats as an alternative to existing fishing craft powered by different types of engines, the possibilities appear to be limited. As in the case of sailing improvements, very careful studies of the operational pattern of the fisheries will be necessary. Motorization has taken place because of its definite economic advantages. Despite the increasing fuel costs, which are partly compensated for by higher fish prices, a motorized craft is still the best option financially, in most situations.

5th Advisory Committee Meeting, 4-7 November 1980, Penang, Malaysia

WORK PROGRAMME

The following outline of a work programme for 1981 is, as in previous years, a preliminary framework of suitable projects and activities matched to the likely capacity of the Programme. Final and detailed plans are subject to the recommendations of this meeting, budget approval by SIDA and discussions with the cooperating agencies concerned regarding counterpart inputs. It may also happen that a closer scrutiny of proposed activities and progress of ongoing projects will result in reduction or expansion of the now envisaged effort for various technical reasons.

In selecting suitable projects for implementation, the following criteria are being followed :

- (i) They should be subject matter oriented and as far as possible be of a single purpose nature. However, many projects will require a cross disciplinary approach, which will be followed wherever necessary but not *per se*.
- (ii) The composition of projects should be in accordance with the priority rating given under "scope and objectives" in the 4th Advisory Committee meeting.
- (iii) They should lead to tangible results in a foreseeable future.
- (iv) Projects for dissemination of results and demonstration follow-up should receive the highest priority.
- (v) National projects must be genuinely supported by the cooperating agencies concerned, by provision of adequate counterpart staff.

For implementation, further efforts will be made to utilize national organizations and institutions in the public and private sectors to the maximum extent possible.

All projects proposed to be discontinued, ongoing projects, and new proposals are listed below under the subject matter headings.

(a) Fishing Gear and Methods

This subject covers all matters related to fishing gear (design and material), methods, and fishing aids (fish finders, haulers and other equipment).

Discontinued:- Fishing gear improvement (Sri Lanka) -as far as experimental work is concerned but will continue for dissemination of results obtained from the completed trials.

- Two boat trawling (India)
- Cottage Industry for Netmaking

Ongoing: —Fishing gear improvement (Bangladesh) which concerns improvement of the large-mesh driftnet fisheries and the behundi net fishery.

- Fishing method diversification (Bangladesh) -will concentrate on the use of high-opening bottom trawls employing small existing fishing boats.
- Demersal Fishing (Sri Lanka).
- Development and testing of line/net haulers.
- Training of fishery extension officers in Orissa (India).

- New:**
- Fish aggregation devices (FAD) -study of the use of FADS in the Bay of Bengal area and elsewhere as a lead into concrete follow-up projects.
 - Trawling and seining methods for traditional craft.

(b) Fishing Craft Technology

Comprises all matters concerning fishing craft i.e. design, construction (methods, materials) powering (oars, sails, engines) and landing facilities as they relate to beach craft.

Discontinued:- Reinforced vulcanized rubber (RVR) boats.

- Studies on boatbuilding materials.

- Ongoing:**
- Motorization of country craft (Bangladesh).
 - Kattumaram improvement (India) -will also include new activities to attempt development of alternative craft to replace the kattumaram.
 - Beachcraft development (Sri Lanka and India).
 - Fishing boat design and prototypes construction (Bangladesh).

- New:**
- Improvement of sailing performance of existing craft.
 - Development of new sailing boats (already proposed last year).
 - Experimental work to explore the possibilities of utilising aluminium as a construction material for beachlanding craft.

(c) Fish Utilisation

This subject covers all matters related to post harvest technology i.e. handling, preservation, processing, distribution and related equipment and materials,

Discontinued:- Nil.

- Ongoing:**
- Fresh fish handling in Orissa (India) -will require less direct input from BOBP in the coming year but will be monitored.
 - Fish drying technology (India) -has just about started and will, subject to progress, be extended to other areas.
- New:**
- Means for distribution of fish — a study will be undertaken to identify improved distribution devices and facilities. This is also related to the study of energy requirements listed below under “other topics”.

(d) Coastal Aquaculture

By coastal aquaculture is meant the farming of fish and crustacea in brackish waters — priority is given to demonstration of techniques already developed and to easily marketable species.

Discontinued:- Nil

- Ongoing:**
- Demonstration farm at Cox’s Bazar (Bangladesh).
 - Aquaculture demonstration of Family Size Units in Ban Merbok, Kedah State (Malaysia).
 - Aquaculture demonstration for Small-Scale Fisheries Development — Phang Nga (Thailand).

- New.*
- Aquaculture development (India and Sri Lanka) -subject to provision of an aquaculture post in BOBP.
 - Technical consultation on coastal aquaculture will be held in connection with the Phang Nga project.

(e) Extension Services

Under this heading fall all projects and activities concerning multi-disciplinary work with large components of social inputs primarily directed towards fishermen families.

Discontinued:- Nil

- Ongoing.*
- Village fish receiving and distribution unit (India) which started as a fish utilisation project will be transformed into a multi-disciplinary project with fish utilization as one component.
 - Extension training (Sri Lanka).
 - Marine fisheries extension (West Bengal).
 - Female resources development (Sri Lanka).
- New.*
- Female resources development (Bangladesh) -similar to the Sri Lanka project.

(f) Other Topics

Under this heading are listed projects and activities which cannot be referred to any of the subject matters above.

Discontinued:- Stock assessment,

- Ongoing:*
- Nil
- New.*
- Energy requirements — a study which was already proposed for the 1980 work programme.
 - Legislative measures -to explore the possibilities of improving the lot of small-scale fishermen through legislative measures.
 - Training policy — a case study in one country, of the training requirements for personnel of different levels concerned with small-scale fisheries, to identify a rational approach to manpower development.

information Services

The responsibility of the information service is to disseminate results of work undertaken by the Bay of Bengal Programme and to promote small-scale fisheries development in general.

Discontinued:- Nil

- Ongoing:*
- Production of BOBP reports, working papers and other information material.
 - Maintaining a library service.
- New:*
- Pictorials of successful work of the BOBP.
 - Descriptions, narratives and bibliographies of subjects or issues of particular interest to small-scale fisheries development in the region.

5th Advisory Committee Meeting 4-7 November 1980, Penang, Malaysia

THE POSSIBILITIES FOR TCDC WITHIN FISHERIES

by E. H. NICHOLS, Consultant

The following represents a brief assessment of the possibilities for TCDC activities within the fisheries sector of the countries within the Bay of Bengal. Comments are also made on such influencing factors as interest and willingness to participate, priorities, funding, and procedural arrangements.

This assessment has been made following a tour of the area from 4th October to 2nd November, 1980; and is also based on many years' experience within the Indo-Pacific Region. The views expressed are those of the Consultant and do not necessarily reflect those of either the BOBP or FAO.

1. Summary

1.1 There are identifiable opportunities for TCDC activities within fisheries in the Bay of Bengal. Both need and matching competence are available and it only remains to marry the two together under suitable funding and procedural arrangements.

1.2 No objections, in principle, to TCDC have been expressed either by policy makers within Governments or executing agencies. Policy attitudes are, however, tempered by the advantages to be derived from such involvement. This applies both to TCDC as such and to the BOBP as an integral part thereof as a supportive agency. There are, in many cases, alternatives available. What remains to be tested is the strength of the expressed willingness to effectively implement TCDC arrangements.

1.3 A major problem area for TCDC is funding. This applies both to national Governments and to supportive organisations. Although certain basic funding can be met from within normal national budgetary processes, there are extraneous costs — usually involving foreign exchange — which present particular funding constraints at national level.

1.4 A further constraint is the availability of competent staff for assignment to TCDC activities. This is becoming an increasing problem as development plans take shape and are implemented. Governments and/or executing agencies are becoming more reluctant to release staff, for anything other than short term assignments (2-3 months or preferably less) and to impose tighter conditions upon their use.

1.5 Attitudinal barriers exist and cannot be ignored. If TCDC is to be a reality such barriers must be overcome or at least neutralised.

1.6 In broad terms those countries declaring greatest needs are seeking assistance on a priority basis in the aquaculture sector of the industry. This includes both inland fresh water fisheries and coastal brackish water fisheries. There is lower priority accorded to marine fisheries even though identifiable TCDC activities are known.

1.7 In the light of the known constraints, and reflecting the opinion of several member governments, there is urgency in the need to precisely identify and define "needs" and "solutions" and to clearly identify priority and urgency of need. This is a prerequisite if limited resources in terms of funding, staff and facilities are to be used to greatest advantage.

1.8 One way of facilitating 1.7 above could be for member countries through their executing agencies to prepare twin and complementary “shopping lists”, which identify need and priority on the one hand and competence and availability on the other.

1.9 Hitherto the secret of successful implementation of TCDC activities has been the capacity of supportive agencies to provide “seed” funding, or “tapping up” monies to cover areas of financial deficit. An ongoing need for such supportive funding is clearly seen, both by member Governments and the Consultant. Withdrawal or non availability of such funding will seriously jeopardise the whole TCDC application within fisheries; and will undoubtedly slow down development process as a whole unless it is replaced by alternative input arrangements.

1.10 There are more than adequate mechanisms and procedures for effecting TCDC activities. In particular the coordinative and facilitating supportive role of the BOBP should be recognised. Strengthening of the BOBP role, by more core staff to cover the new interest areas now opening up and by increased funding for TCDC activities, should be seen as a key to future fisheries development within the region.

2. Outline Proposals for TCDC Activities in Marine and Brackish Water Fisheries Within the Bay of Bengal Region

2.1 Although interest in and uptake of the following will, in the final analysis, depend upon a variety of factors — including the interest of individual countries, the necessary funding arrangements being agreed, and the establishment of suitable procedures—several areas for ongoing and perhaps increasing TCDC activities suggest themselves as worthy of more detailed consideration. Whilst such activities can in the main be met by cooperation within the BOBP and region, the extension of such cooperative efforts to adjacent countries and areas, such as those included within the purview of the South China Sea Programme should not be excluded. There are links whereby such joint activities can be effected through the normal liaison channels of the BOBP and SCSP.

2.2 *Coastal and Brackish Water Fisheries:* Interest in the region is heavily weighted in favour of the development of this sector fishery. There are many reasons for this, which it is not necessary to enumerate herein, and it would appear that this is one of the major areas in which TCDC activities should be concentrated. Bangladesh, Sri Lanka and Malaysia have all expressed interest in this sector, and both Thailand and India are actively promoting this sector and have considerable expertise therein.

2.3 Although there is need to precisely identify and define individual TCDC activities before embarking thereon, the following outline areas would seem to hold out promise of fruitful results :

(a) There is interest in the culture of Penaeid prawns, both as an export oriented venture and for domestic consumption. Both India and Thailand, and neighbouring Indonesia, have experience and expertise that can be tapped to advantage by other participating countries.

(b) Any development of this sector fishery will inevitably lead to the culture of pondfish, such as milkfish, *Chanos* etc., and here there is expertise to be obtained from India and perhaps even more so from Indonesia and the Philippines.

(c) Where feasible cage culture should be developed, and this could include a wide range of species including *Lates* and *Siganus* and also others if true marine cage culture is included. Although this is a relatively new area for development, there is expertise within the region in Malaysia and Thailand, and — particularly in marine cage culture — in Hong Kong.

(d) The culture of oysters and mussels could be important in individual economies, and interest has already been expressed therein by Bangladesh, expertise is available from India and Thailand.

(e) With the current proposals for relatively rapid expansion of this sector fishery in such countries as Sri Lanka and Bangladesh there is a very real need foreseen for training of staff. This includes not only scientific/research staff involved in the foregoing types of TCDC activities, but also specialised technicians and others concerned with extension activities in the field.

Such training could perhaps best be given at least initially by “tailor-made” courses for trainers at, say, suitable institutes in India, Thailand and elsewhere according to individual country needs; and followed up by wider impact workshop training courses within countries using trained local staff backed up by TCDC expertise.

(f) Although stated in the context of reservoir and fresh water ‘tank’ farming there would appear to be need for further enquiry into the development of fishing gear for harvesting from lagoon and estuarine fisheries. This is a difficult area in which to pin down expertise but, dependent upon the individual fishery as defined in (a)-(d) above, such expertise will probably be best obtainable therefrom; but special attention would need to be paid to this particular aspect of production.

(g) Although not specifically identified by any country as an area of interest it is considered that aquaculture engineering will become an increasing point of interest and importance in this sector fishery — especially as hydraulic problems develop. Attention therefore is invited to the fact that the Asian Institute of Technology (AIT), Bangkok, is considering aquaculture engineering as part of its future syllabus. In the interim expertise is available, albeit on a limited scale, from the Philippines.

2.4 Marine Fisheries: Whilst development of this sector fishery attracted less “political” interest than the former it remains very important for most countries within the region. This is especially valid when considering the development of coastal fishing, where there is still much to be achieved in terms of improved craft and design, fishing gear technology and methods, navigation and engineering standards, etc.

2.5 Discussions with Fisheries Department staff concerned with operational development problems within the industry lead one to suggest that there is scope for TCDC activities in the following major areas within marine fisheries :

(a) There continues to be interest in evolving new and improved fishing gear technology and associated fishing techniques; this would include net making, mesh size, shaping, etc., as well as ‘line’ fishing techniques. Although all countries have, or are developing, their own centres specialising in this area there would seem to be merit in promoting TCDC exchange with expertise available from, say, India, Thailand and Malaysia.

(b) Likewise there are needs seen in further expanding and developing navigation and engineering skills; and here again expertise is available from, say, India should advantage wish to be taken thereof.

(c) One country in particular expressed interest in what may be described as “craft technician” training, to equip the extension worker with the necessary expertise to advise both fishermen and boat-builders on craft design and lines for adaptation to more modern designs or more flexible fishing techniques, and to facilitate monitoring of loan funds given for construction of new boats etc. (This does not imply training to the level of a naval architect but to sub-professional/specialised technician standards). There probably is wider need for such training; and this is available from India.

(d) There is need for the training of extension workers, in both “overview” and more specialised techniques, for the development of the marine fishery. Although most countries have developed, or are developing, their own centres for such training, in the interim countries such as Sri Lanka and Bangladesh may wish to take advantage of facilities available in India and Thailand.

(e) Marketing and post-harvest technology, including quality control, continue to present problems for marine fisheries and all countries are actively engaged in these subject areas. Exchange of knowledge and expertise could be advantageous to all countries; and TCDC “workshop” approaches may be considered, based on selected centres of excellence in differing countries. India, Thailand and Sri Lanka for example, with focus on *specific* subjects, such as fish and prawn processing, quality control measures, etc.

(f) Although enquiry evoked a negative response from India, there does seem scope for the introduction of technical cooperation in joint stock assessment where countries have contiguous

fishing boundaries and where migratory common stocks are being fished. There are several global examples where failure to reach agreement on such stock exploitation—and this can mainly be agreed only through joint stock assessment discussions — has led to disastrous diminution of specific stocks, with serious effects for both producers and consumers as well as the economy as a whole. Successful joint stock assessment workshops have been held between Malaysia and Indonesia in respect of the Malacca Straits. Comparable workshops could be fruitful between India and Sri Lanka in respect of the Gulf of Mannar and Palk Bay.

2.6 /n/and freshwater Fisheries: Although not specifically included in the Consultant's terms of reference, in view of the very strong interest expressed by most countries in developing this sector fishery, and especially by Bangladesh and Sri Lanka, attention is drawn to the possibilities of TCDC activities in inland freshwater fisheries. It is appreciated that it may be necessary to broaden the "brief" to which the BOBP works to enable it to facilitate such activities.

2.7 All countries are engaged in development/production activities in this fishery; but not all production is at the same developmental stage and thus useful TCDC exchange can take place. This even applies in areas where activities are on a par but where all share common problems. The following outline areas are put forward for further and more detailed consideration :

(a) A major interest in the development of inland fisheries is through the massive pond culture of carps. Both India and Malaysia have expertise and experience in this field, as has Indonesia ; and this can be used with advantage especially by Bangladesh and Sri Lanka.

(b) Commercial catfish culture (*Pangasivs*) is well developed in Thailand and India; and again this experience and expertise could be used with advantage in other countries especially Bangladesh and Sri Lanka.

(c) *Tilapia* culture is well developed in India, and Indonesia, and that technology merits transfer to other countries of the region.

(d) Poly culture of carps with or without other fish species is another area in which there are distinct possibilities for TCDC activities improving production. Here the greatest expertise lies outside the region in China, Indonesia and Hong Kong, although Malaysia and India could provide alternative focal points for training and exchange of experience.

(e) Integrated fish culture, with ducks, poultry and pigs, also provide TCDC opportunities with Thailand within the region, but more especially with China, Hong Kong and to a lesser extent, with the Philippines.

(f) A potentially important area for development is in the culture of the Giant Freshwater Prawn, *Macrobrachium rosenbergii*, and here there is expertise and experience available specially from Malaysia and Thailand within the BOBP, and Indonesia through the SCSP.

3. Assessment of Interest and Willingness of Respective Governments in TCDC and their Orders of Priority

3.1 Most if not all of the participant governments have been involved in some form of mutual technical cooperation with other developing countries for many years now. They are politically committed to the concept of TCDC and all are in one way or another, actively engaged in implementing that concept. TCDC does involve more than the fisheries sector however; and in the final analysis commitment resolves itself as a matter of priorities — usually in relation to funding availability — other than interest and willingness as such. Having said this it must be noted that attitudes to TCDC, and thereby the BOBP, are tempered -at least at policy decision taking levels, if not so much at executing agency levels-by the direct advantages to be obtained therefrom. Where no discernible advantages accrue there is reluctance to committal, other than in expressions of agreement in principle. Conversely where there are clearly discernible advantages to be seen then there is marked increase in enthusiasm. Both these stances are, in turn, further modified by the question of from where funding will originate.

3.2 *Bangladesh* relies on inland and freshwater fisheries for two thirds of its fish consumption, which in turn provides the greater part of the country's protein intake. Marine fisheries, apart

from providing a lesser amount of the national diet intake, face consumer product resistance which keeps prices depressed relative to fresh-water fish. The recently stated fisheries development target for the next 4-5 years clearly indicates the priority given to the expansion of inland fresh water fisheries production. To a lesser extent it is hoped to expand development of the coastal, brackish water fisheries, Marine fishery expansion is least important in planning priorities. Hitherto, in the main, marine fisheries exploitation has been by joint ventures with Thailand; there are however, problems arising therefrom.

3.3 Attitudes to TCDC inputs at policy decision taking levels are undoubtedly influenced by the plethora of other "aid" inputs which are currently being injected into Bangladesh. Whilst the need for assistance in the priority fisheries areas indicated is clearly seen within national planning, the part to be played by TCDC may be less certainly defined. The need for TCDC assistance to supplement national efforts is most clearly seen within the executing agencies (mainly the Department of Fisheries).

3.4 Fisheries TCDC activities in Bangladesh should concentrate on inland and coastal brackish water fisheries activities. Other fisheries TCDC activities to take second place.

3.5 Sri Lanka has clearly defined its interests and priorities in a "Master Plan", also for the next 4 years. This plan advocates development of the deep sea resources to, and through, foreign assistance (probably joint ventures). Offshore fishing (30-50 miles) is to be developed with foreign assistance-largely under foreign aid programmes-but this does not preclude TCDC involvement, although clearly there is no TCDC input into deep sea fishing development. Government's direct marine fisheries development programme will concentrate on the coastal zone (up to 25-30 miles) ; and will aim at increased catch and effort through the introduction of more modern craft and gear design, techniques and infrastructure. There is thus scope for TCDC activities within this sphere.

3.6 However, a major *effort* is to be made in fisheries development within the 344,000 acres of inland tanks and reservoirs, and the 300,000 acres of brackish water lagoons, estuarines and mangrove swamps which are currently under-exploited. There is, at present, an FAO Aquaculture Development Project Team in Sri Lanka undertaking a study with a view to putting up development proposals for UNDP funding for these areas. There is, or should be, considerable scope for TCDC involvement in such a development programme.

3.7 The Sri Lanka Government quite clearly expressed the view that, in fisheries, priority should be given to aquaculture development in TCDC activities. It recognised funding and other constraints, and did not wish in any way to detract from the area of main thrust in fisheries TCDC needs as seen by it.

3.8 *India's* expressed fisheries interests presently lie in developing the shrimp resources off its eastern seaboard for export-oriented production. The "startline" for such development rests in a basic survey and assessment of these resources; and this clearly lies outside the scope of TCDC capabilities.

3.9 Generally there is no objection to TCDC, but as a country more likely to be giving than taking it is worth noting that a recent policy statement (by the Minister responsible for fisheries matters) indicated that a much more critical assessment will be made of the release of Indian expertise at least for assignment overseas. Whether or not there will be a comparable tightening of criteria in accepting trainees, including those under TCDC arrangements, remains to be seen. **At** present the climate of opinion remains optimistic in this respect. This is somewhat critical because, by virtue of sheer size and capacity, India is probably best suited to accept reasonable numbers of trainees at any given time.

3.10 Although India has allocated a sizeable portion of its current IPF to fund TCDC activities it may well be significant that there are examples of expertise now only being offered on a "commercial basis" as paid consultancies. (This development of locally based consultancy services in developing countries has been noted elsewhere and in adjacent regions). The implications for TCDC activities are self evident.

3.11 Discussion with the Directorates of the various Central Institutes liable to be involved in training or linked research-cum-training commitments, indicated a willingness to participate in TCDC activities. Subject of course to policy clearance and satisfactory funding arrangements.

3.12 At policy decision taking levels stress was strongly placed on the need to precisely identify and define need and capacity existing within TCDC undertakings. Given that these criteria can be met then India could participate.

3.13 *Thailand* has long expressed its interest in obtaining wider fishing access to new grounds to absorb the catching capacity of its fleet. It is keen therefore to establish fishing agreements that can provide such access to joint ventures. Although not in themselves TCDC activities there can be TCDC elements within the related agreements and joint ventures.

3.14 Thailand is firmly committed to TCDC, and is willing to participate, and does so over a wide front. Willingness to become involved faces two constraints. These are, funding limits and limited manpower-availability for overseas assignments. The latter must be of only short term (2-3 months) duration. There are fewer constraints on training within Thailand, although the preference is to set up training courses as such rather than deal with indefinite numbers and timing of individual "training visits". Details can be worked out, but disappointment was expressed in the poor response to a comprehensive fisheries training course offered this year. There were less than 10 participants in a course set up for 40; and Thailand was meeting all costs including travel.

3.15 It should be recognised that Thailand has alternative options open to it in respect of TCDC affiliations. It already has strong linkages with the SCSP, and through SEAFDEC and the ASEAN Secretariat. There are also bilateral arrangements for cooperation with Malaysia and other countries. In hard terms it does not obviously stand to gain from TCDC linkages within the BOBP unless through satisfactory joint venture arrangements arising therefrom. This is not to say that Thailand will not support TCDC — it is already heavily committed thereto and through Thai-Aid programmes complementary to such concepts.

3.16 Malaysia's interest in marine fisheries within the Bay of Bengal is limited. Its "regional" marine fishing activities lie within the coastal waters of the Malacca Straits, which it shares with Indonesia. Most of its future marine fisheries development lies in its eastern waters in the South China Sea. Within marine fisheries therefore there seems little likelihood of TCDC involvement other than in response to requests. There is, however, keen interest in aquaculture activities; and subject to the normal funding and staffing constraints there is willingness to cooperate in this sector in particular.

3.17 Malaysia also has alternative options open to it in respect of TCDC affiliation. These options, which are to all interests and purposes similar to those for Thailand, in many ways offer more positively advantageous TCDC exchanges than are available through the BOBP. This factor should be borne in mind as a potential influence on policy attitudes and commitments to the programme.

4. Funding and Procedural Matters Relevant to TCDC

4.1 There are various options open to countries for the funding of TCDC activities, and there are examples of these alternatives within countries of the region. It must, however, be appreciated that when a country decides to seek a TCDC allocation from its national budget, or its IPF, that allocation relates to all areas that fall within TCDC jurisdiction and not just fisheries. Whilst it has proved possible to obtain a broad view therefore of funding allocation, it has not been possible to determine precise details for the fisheries sector-if indeed they are fully known due to a 'masking' effect when partial use of fisheries departmental resources are injected in a wide manner of ways.

4.2 *India* has allocated 10% of its current IPF budget to TCDC activities; this represents some US \$5 million. *Thailand* on the other hand refused to allocate any of its IPF, and instead has allocated US \$500,000 for all its TCDC activities. *Sri Lanka* has fully utilised its own IPF and cannot make an allocation, per se, from the national budget. It would however, be prepared

to agree to an allocation to TCDC activities from the Regional IPF. *Bangladesh* also has fully committed its IPF and is not in a position to budget nationally for TCDC activities. *Malaysia* tends to the view that national IPF funds should not be used for TCDC activities. It was not possible to determine whether there is any specific provision for TCDC in the national budget but this seems likely — what seems more likely would be provision for a specific project which was attractive.

4.3 What is also significant in relation to TCDC generally, or to the fisheries sector in particular, is the presence of several other established mechanisms for “TCDC” activities. These include :

- (a) The Indo-Ceylon Joint Economic Cooperation Agreement under which known but non-fisheries TCDC has been effected.
- (b) The Thai-Bangladesh Fishery Agreement — through which joint ventures have been effected.
- (c) A formal agreement between Malaysia and Thailand to cooperate in ‘Agriculture’, including fisheries.
- (d) An informal understanding between India and Thailand from which private sector joint ventures in fisheries have been effected.
- (e) An Indonesian-Ceylon agreement to cover cooperation in expert services and mutual use of training facilities is currently under “formalisation” procedures.
- (f) ASEAN (The Association of South East Asian Nations) -through a joint secretariat in Bangkok provides a standing mechanism for TCDC activities- through in this case its Committee on Fisheries (at present only Malaysia and Thailand are involved from the BOBP).
- (g) SEAFDEC (Southeast Asian Fisheries Development Council) which is specifically for collaborative fisheries research, training and extension activities. Again only Malaysia and Thailand are directly involved but, subject to negotiation, staff from other countries may be accepted for training purposes.

This is not an exhaustive list and should be treated as indicative only. The point made is that there are alternative mechanisms, fundings and procedures for TCDC implementation.

4.4 Whilst the above mechanisms, may, in theory, have a role to play in fisheries TCDC activities, in practice their impact to date has been relatively limited. This does not apply to the same degree to the two latter organisations (f) and (g) which are marginal to BOBP but whose impact within their own organisational confines have been most effective.

4.5 Hitherto the success of fisheries TCDC has revolved round the availability of supportive funding from within the UN development system and or from Trust Funds. These funds have been used either as ‘seed’ money, to “prime the pump” or to supply hard currency foreign exchange monies for external travelling expenses, airtickets, etc. Unless such funding is continued, and preferably expanded, then despite the financial inputs by member countries-in terms of staff salaries and local costs, etc. -the future for TCDC does not look bright in practical terms. Failure of the TCDC mechanism could have severe impacts on fisheries development, especially in terms of programme planning and time periods for implementation.

4.6 At the national level TCDC focal points have been, or are being, established. The extent and effectiveness of coordination between the national and sectoral (e.g. fisheries) focal points varies amongst countries. In many instances sectoral focal points are well established and have long standing reciprocal contacts in neighbouring countries. These contacts between “executing” agencies should be strengthened but within a closer nationally coordinated programme. The national focal point could well concentrate on overall policy and planning, and assist by obtaining increased funding for TCDC projects, which are then handed over to the executing agencies to implement.

4.7 *Thailand* has a national focal point within the Department of Technical and Economic Cooperation; the sectoral focal point is the Department of Fisheries. *India* has a focal point,

the Director of the International Cooperation Division, within the Ministry of Agriculture and Irrigation; this focal point coordinates TCDC activities in the Fisheries Department and in the Central (Fisheries) Institutes administered by the Indian Council of Agricultural Research. Sri Lanka coordinates its TCDC through the International Economic Cooperation Division, of the Ministry of Finance and Planning, in association with the External Resources Department of the same Ministry. Malaysia has the national focal point in the Economic Planning Unit of the Prime Minister's office with the sectoral focal point in the Department of Fisheries. In Bangladesh all fisheries TCDC is channelled through the Ministry of Fisheries, which then undertakes clearance with other Ministries.

4.8 There are more than adequate mechanisms and procedures for effecting TCDC activities. In particular the coordinative and facilitating supportive role of the BOBP should be recognised. Strengthening of the BOBP role, by more core staff to cover the new interest areas now opening up and by increased funding for TCDC activities should be seen as a key to future fisheries development within the region.

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