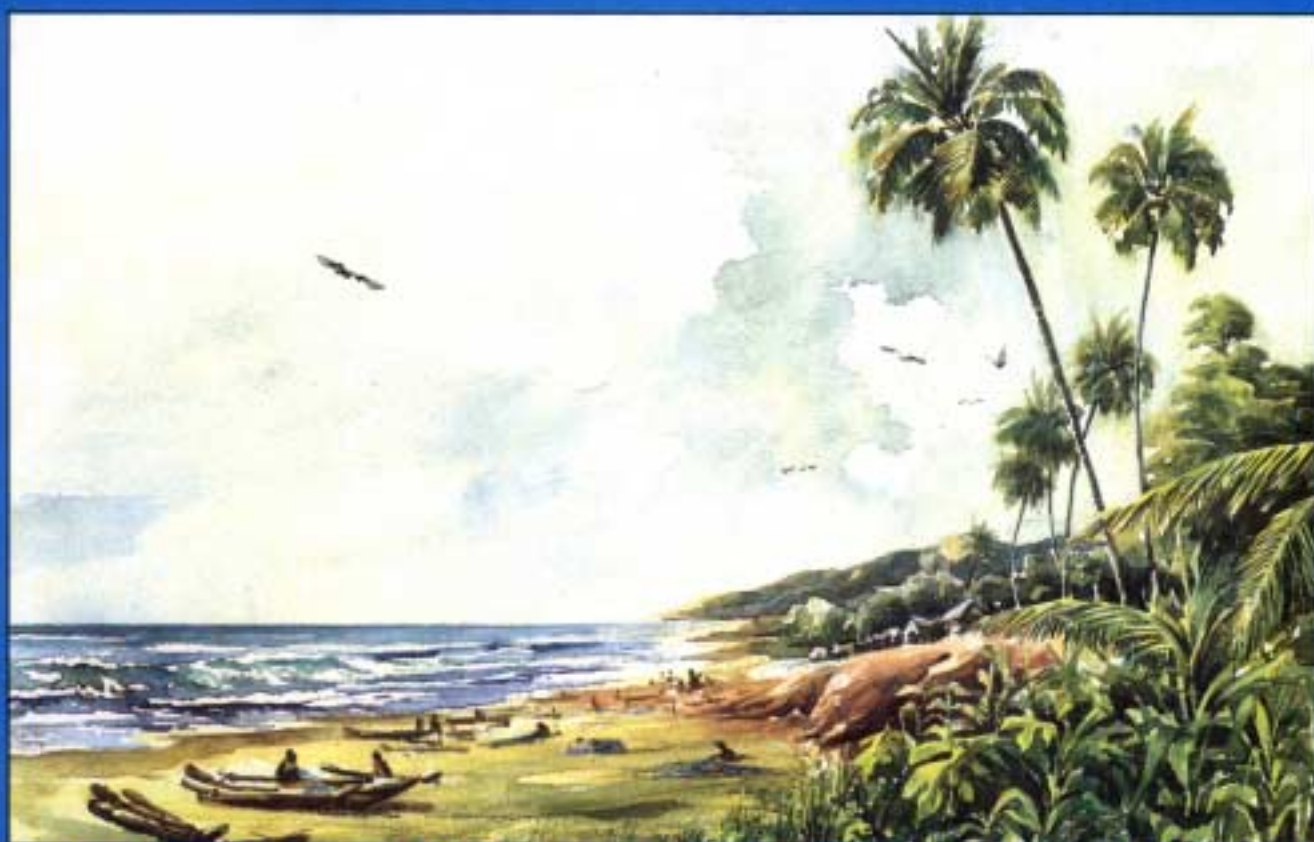


Report of the 23rd Meeting of the Advisory Committee



INTEGRATED COASTAL FISHERIES MANAGEMENT

**REPORT OF THE TWENTY-THIRD MEETING
OF THE ADVISORY COMMITTEE**

27-28 March, 1998
Negombo, Sri Lanka

**BAY OF BENGAL PROGRAMME
Chennai, India
1998**

This document records the recommendations of the 23rd Meeting of the Advisory Committee of the Bay of Bengal Programme (BOBP). The meeting was held on 27-28 March, 1998, in Negombo, Sri Lanka.

The document contains a Progress Report for 1997, which includes Project Factsheets that chronologically describe the progress of activities carried out in each country under the Coastal Fisheries Management project during the BOBP's Third Phase (1995,1996,1997). The document also contains a two-year Regional Workplan for 1998-1999.

The BOBP's Advisory Committee is composed of member-countries, agencies funding BOBP projects, and the FAO. The Committee usually meets once a year by rotation in member-countries.

The Bay of Bengal Programme is a multi-agency regional fisheries programme that operates in seven countries around the Bay of Bengal – Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, Thailand. The Programme plays a catalytic and consultative role in developing coastal fisheries management in the Bay of Bengal, thereby helping improve the conditions of small-scale fisherfolk in member-countries.

The BOBP is sponsored by the Governments of Denmark and Japan. The executing agency is the FAO (Food and Agriculture Organization of the United Nations).

CONTENTS

Report of the 23rd Meeting of the Advisory Committee

Appendices

A.	List of Participants	
B.	Inaugural address by the Hon. Mahinda Rajapaksa (Minister of Fisheries & Aquatic Resources Development, Sri Lanka)	7
C.	Agenda	9
D.	List of Documents	10
E.	State of the Programme	11
F.	Progress Report 1997: Coastal Fisheries Management in the Bay of Bengal	14
G.	Proposed Two-Year BOBP Regional Workplan for 1998 - 1999: Coastal Fisheries Management in the Bay of Bengal	40
H.	Project Inputs and their Utilization	50
I.	Progress Report 1997-98 : Post-Harvest Fisheries Project (DFID - PHFP)	58
J.	NACA's statement to the BOBP Advisory Committee	82
K.	Publications during the BOBP's Third Phase	84

REPORT OF THE 23rd MEETING OF THE ADVISORY COMMITTEE

Opening of the Meeting

1. The Advisory Committee of the Bay of Bengal Programme (BOBP) held its twenty-third meeting on 27-28 March 1998, at the Browns Beach Hotel, Negombo, Sri Lanka. The list of participants and observers is given in Appendix A.
2. The Hon. Mahinda Rajapaksa, Minister of Fisheries and Aquatic Resources Development, Government of Sri Lanka inaugurated the meeting.
3. The meeting was chaired by the outgoing Chairman, Dr Y S Yadava, Development Commissioner (Fisheries), Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India.

Election of Chairperson

4. The Advisory Committee unanimously elected Mr. Neville Piyadigama, Secretary, Ministry of Fisheries and Aquatic Resources Development, Sri Lanka as its Chairperson, to hold office until the beginning of the next meeting.

Adoption of the Agenda

5. The Advisory Committee adopted the Agenda for the meeting (as in Appendix B). The documents made available to the Committee are listed in Appendix C.

Coastal Fisheries Management

6. There is an urgent need for the Member Countries, FAO and Donors to seriously consider the possibilities of evolving an inter-governmental body in the Bay of Bengal region, to facilitate and enable improved management of fisheries and aquaculture, beyond the project period of the BOBP (3rd Phase).
7. The fisheries sector in the Bay of Bengal region is increasingly facing an external onslaught of non-tariff trade barriers, and there is a need for the Member Countries and FAO to jointly address this concern, which threatens a vital part of the economy and the food and livelihood security of a large number of fishers.
8. Bangladesh, in the context of promoting alternative income generation options and empowering fishers to enable them to reduce fishing effort in the ESNB and PN fisheries in its BOBP-assisted effort, is constrained by availability of funds and seeks assistance.
9. In the context of the need to share the learning generated in BOBP-assisted pilot projects amongst Member Countries, study tours and regional workshops for BOBP counterpart staff are encouraged.
10. Indonesia, in spite of its difficult economic situation, is still committed to contributing towards BOBP activities in the spirit of national execution, particularly to conduct national workshops on sea-farming and community-based fisheries management. Indonesia requested that activities should be planned well ahead and implemented on time to enable the allocation of budgets.

11. Indonesia, in the context of its BOBP-assisted effort, suggested that there is immediate need to identify a consultant to help improve the handling and processing of anchovy, and an experienced private-sector consultant from Indonesia may fill the requirement.
12. In the context of evolving community-based fisheries management, to improve the quality of management, make it more people-centered and reduce the costs of enforcement, the success of such efforts depends to a large extent on people and organizations to promote social action. This would suggest that there is a need to focus more on the human and social dimensions of fisheries management.
13. Maldives, in the context of implementing the Integrated Reef Resources Management Plan, needs direction in determining strategies and evolving decision making platforms for management, and emphasized the need to undertake the proposed study to document and learn from traditional management practices as soon as possible.
14. Sri Lanka, in the context of better managing its coral reef resources and reducing damage to its marine habitats, is interested in reducing the extraction of coral, and seeks assistance in identifying appropriate technologies and alternative sources of lime, which is the primary product of coral.
15. Sri Lanka is committed to and is in the process of reorganizing the Ministry of Fisheries and Aquatic Resource Development and the Department of Fisheries and Aquatic Resources, in order to improve their performance and better address their mandate, and requires assistance to strengthen its Monitoring & Evaluation and Management Information Systems.
16. Thailand, in the context of its interest in extending the learning of the BOBP- assisted activity to other parts of the country, is very interested in better understanding the performance and impact of the activity and seeks assistance to undertake an assessment.
17. The Member Countries are in the process of considering seafarming as a means to provide food and livelihood and as a way to reduce excess effort in capture fisheries. Given the learning in related aquaculture activities, the Member Countries are interested in better understanding the social, environmental and legal implications of such efforts to enable them to take a precautionary approach to management. In this context, the Committee felt the need for a regional workshop to expose them to these diverse, macro-level issues and concerns and requested FAO to advise them and explore possibilities.
18. Given that the Member Countries are signatories to a variety of international conventions, regulations and laws pertaining to the environment and fisheries, which often have important national and regional impacts and implications, there is a need to build awareness on these issues amongst Member Countries, through workshops and dissemination of information.
19. In order to help Member Countries to be exposed to and benefit from the work undertaken by Associate Professional Officers attached to the BOBP, periodic reports of their work should be circulated.

Post-Harvest Fisheries

20. The Committee was informed by the Project that its term was coming to an end shortly and it would cease its operations on 31 March 1998. Bangladesh, India and Sri Lanka, where the project had been functioning, expressed their satisfaction with the project's efforts, and added that they had wished for an extension to address important post-harvest needs in the countries. They recorded their appreciation of the project, its efforts and the benefits that had accrued from it and extended their good wishes to the project's staff.

21. The FAO and the Bay of Bengal Programme, referring to the long association they have had with the project, recorded their appreciation of the Department for International Development - UK, the Project, its efforts and contribution to the field of post-harvest fisheries, and extended good wishes to Mr Duncan King, Project Field Manager and his staff.

Cleaner Fishery Harbours

22. The Committee was informed of the completion of the project in Sri Lanka, and the progress of the project in the Maldives, where it would be completed in the near future. It was also informed of the development and production of a **manual** for the region, aimed at fishery harbour managers and administrators, which would provide them with guidelines and document the project's learnings.

Other Matters

23. The Committee was informed about the progress made in the development of the proposal on Sustainable Management of the Bay of Bengal Large Marine Ecosystem, which had been submitted to GEF for financing as a Block B Grant. The Committee was also informed of the GEF Secretariat's final approval of the Block B Grant. Further, the GEF eligibility criteria were reviewed with special emphasis on **the** incremental cost concept. And, within this context, it was clarified that the eventual GEF Regional Project, while building on the results of BOBP, would not constitute an extension of BOBP's current activities.
24. The Committee was informed by the FAO about important current initiatives in the area of fisheries and aquaculture development and management, specifically the forthcoming consultations and technical working group meetings on management of fishing capacity, conservation and management of sharks and reduction of incidental catch of seabirds in longline fisheries. The FAO also took the opportunity to brief the Committee on the outcome of the FAO Technical Consultation on Policies for Sustainable Shrimp Culture, held **in** Bangkok, December 1997.
25. The Committee concurred with the recommendations of BOBP's Mid-Term Evaluation and proposed that efforts be taken to provide the fishery agencies of Sri Lanka and the State of Tamil Nadu in India with assistance to develop and strengthen their overall monitoring & evaluation and management information systems.
26. Indonesia expressed concern about the economic situation in their country and informed the Committee that the government was in the process of re-considering its commitment to regional and international bodies.
27. Bangladesh, wishing to facilitate the progress of BOBP-assisted activities, recommended that periodic meetings of BOBP staff and counterpart staff be held to review progress and give direction to future actions.

Next Meeting

28. The Committee graciously accepted the kind invitations of Bangladesh and Thailand to host the next meeting of the BOBP's Advisory Committee, **in conjunction** with the 11 th Session of the IOFC/BOBC, subject to government clearance and approval. The final decision will be taken in consultation with FAO, **the** IOFC/BOBC Secretariat and the concerned Member Countries.

Adoption of Report

29. The Committee adopted the report on 28 March 1998.

Appendix A

LIST OF PARTICIPANTS

Bangladesh

Md. Abdul Wahhab
Deputy Secretary
Ministry of Fisheries and Livestock
Bangladesh Secretariat
Dhaka

Md. Harun-or Rashid
Deputy Director (Marine)
Department of Fisheries
Chittagong

FAO

Blessich, Dora
Project Operations Officer
RAPA, Bangkok

Seilert, Heiko
Marine Fisheries (APO)
RAPA, Bangkok

Cooney, Barbara
Investment Centre (TCI)
FAO, Rome

Willmann, Rolf
Senior Fishery Planning Officer
FAO, Rome

India

Yadava, Y S
Fisheries Development Commissioner
Government of India
New Delhi

Indonesia

Sugiarto, Djoko
Director of Program
Directorate General of Fisheries
Jakarta

Siregar, Sihar
Chief, Sub Directorate of Mariculture Development
Directorate of Production
Directorate General of Fisheries
Jakarta

Malaysia

Ahmad Sabki bin Mahmood
Director of Corporate Planning
Department of Fisheries
Kuala Lumpur

Chong, George
Head of Resources Management
Department of Fisheries
Kuala Lumpur

Maldives

Ahmed, Hafiz
Deputy Director
Marine Research Section
Ministry of Fisheries and Agriculture
Male

Sri Lanka

Piyadigama, Neville
Secretary
Ministry of Fisheries and Aquatic Resources Development
Colombo

Piyasena, G
Director, Planning & Monitoring
Ministry of Fisheries and Aquatic Resources Development
Colombo

Nagodavithana, M T K
Acting Director
Department of Fisheries and Aquatic Resources
Colombo

Fernando, H V C
Deputy Director
Department of Fisheries and Aquatic Resources
Colombo

Kulatunga, A A
Deputy Director, Environment Division
Ministry of Forestry & Environment
Colombo

Ekanayake, M B
Additional Director
Department of National Planning
Colombo

Thailand

Somsak, Chullasom
Marine Fisheries Specialist
Department of Fisheries
Bangkok

Pimoljinda, Jate

Director
Andaman Sea Fisheries Development Centre
Phuket

Observers

Broadfield, Robin

GEF Operations Coordinator, World Bank, U S A

Jayasekara, A.M.

Vice-Chairman, Governing Council
Network of Aquaculture Centres in Asia (NACA)
Colombo, Sri Lanka

Secretariat

Chong, Kee-Chai

Programme Coordinator

Roy, R N

Snr. Communication Adviser

King, D

Post-Harvest Fisheries Adviser

Verduijn, R

Fisheries Economist (APO)

Bierhuizen, B

GIS Officer (APO)

Scurville, S

Administrative Officer

Verghese, C

Secretary

Appendix B

INAUGURAL ADDRESS BY THE HON. MAHINDA RAJAPAKSA

(Minister Of Fisheries & Aquatic Resources Development, Sri Lanka)

Your Excellencies, distinguished delegates, FAO officials, staff of the Ministry of Fisheries and Aquatic Resources Development, ladies and gentlemen.

First and foremost I wish to thank the organizers of this meeting for the very kind invitation extended to me to inaugurate the 23rd Advisory Committee meeting of the FAO/Bay of Bengal Programme and to address this distinguished forum. I consider it a great honour and privilege to have this opportunity to be associated with you and also to share a few thoughts with you. I understand that delegates from Bangladesh, India, Indonesia, Malaysia, Maldives and Thailand are here to participate in this expert consultation on matters related to the Bay of Bengal region.

Let me then take this opportunity to extend a warm welcome to the distinguished delegates of the member countries of the Region, staff of the FAO and to all the distinguished representatives of the donor agencies who have come to Sri Lanka to attend this meeting of the Advisory Committee of the Bay of Bengal Programme. At this stage, it may not be inappropriate to remind this forum, that the Government of Sri Lanka is very happy to offer host facilities for this meeting, particularly due to the fact that it was in Sri Lanka that the Bay of Bengal programme was launched in the late seventies, and that its headquarters was first located in Colombo.

As participating countries, we have reason to be satisfied with what has been achieved by the three phases of the programme during the past two decades. In this regard on behalf of the government of Sri Lanka, let me thank the FAO and the Bay of Bengal Programme for the useful services rendered concerning management and development of fisheries in the region.

The challenges confronting the Bay of Bengal Region with regard to fisheries are many and formidable. I would like to present some of my views concerning measures deemed necessary for sustainable development of this important sector.

The first is the awareness of the importance of fisheries. It is vital for the general public and the regional and international community to understand that fisheries are extremely important in economic development and food security in the developing countries, both for increasing job opportunities and for promoting the welfare of those engaged in fisheries. Promoting this understanding should be the very pre-requisite for all other steps to follow.

Second, inshore resources, including ornamental fish resources in most of the countries of the region, continue to be under intense pressure. This calls for an effective fisheries management system in a manner which ensures sustainability of resources and brings about a recovery of depleted stocks so that the highest possible benefits go to fishing communities.

Third is the preservation of the aquatic environment. Environmental problems are cropping up as a result of illegal activities, discharge of waste, pollution and coastal migration. Despite the growing awareness and concerns, coastal and other aquatic ecosystems continue to be degraded by pollution and unsound forms of utilization. These have negative impact on fisheries and on shallow-water fish habitats such as mangroves, seagrass beds, coral reefs and estuaries which are biologically the most productive and the most ecologically diverse aquatic environments. These issues need to be adequately addressed. Those responsible for fisheries should cope more positively with preventing the degradation of the aquatic environment and preserving coastal zones.

Lastly there is the need to formulate and implement sound sector development plans and ensure that development will be more orderly, realistic and rational and, in particular, take into account the lessons we have learnt in the past. It should be mentioned here that all countries in the region have benefited immensely from the technical co-operation received from the BOBP programme to handle these situations satisfactorily.

Appendix C

AGENDA

Friday 27 March 1998, 0900 hrs.

1. Inauguration of the Meeting
2. Election of Chairperson
3. Adoption of Agenda
4. Report 1997 & Workplans 1998- 1999 - Coastal Fisheries Management Project (BOBP-FAO)
5. Report 1997 - Post-Harvest Fisheries Project (DFID-UK)
6. Report 1997 - Cleaner Fishery Harbours Project (IMO)
7. Briefing on Current Issues & Concerns of Fisheries by FAO
8. Report on Status of GEF Proposal
9. Other Matters

Saturday 28 March 1998, 1400 hrs.

10. Next Meeting
11. Adoption of Report

Appendix D
LIST OF DOCUMENTS

1. Agenda (Provisional)
2. List of Documents (Provisional)
3. List of Participants (Provisional)
4. State of the Programme Report
5. Report 1997 & Workplans 1998-1999 - Coastal Fisheries Management Project (BOBP-FAO)
6. Report 1997 - Post-Harvest Fisheries Project (DFID-UK)
7. Report 1997 - Cleaner Fishery Harbours Project (IMO)

Appendix E

STATE OF THE PROGRAMME

As we begin the last two years of our Project, it is heartening to report some positive trends - the result from heightened management awareness of the “managed fisheries” process in some member countries. The trends are reflected in the steady gains in the recovery of certain fisheries stocks and resource habitats, which in turn show up in improved fish catches by fishermen in pilot project areas. Our collective effort should not slacken now. Close follow-up and the need to stay “engaged” with all the stakeholders are called for.

Our Project has demonstrated that basic awareness in the community we work with creates its own co-operative spirit in the stakeholder community and leads to “community bonding” (members of the community coming together and working together). More important, awareness fosters “ownership of the problems”- what fishermen used to perceive as someone else’s problems are now regarded as their own. Earlier perceptions of the problems as those of someone else, to be tackled and solved by others, did not help overcome the problems or generate any perceptible benefits. This sense of community and spirit of community are increasingly observed in our pilot project areas.

Example: Until recently, fishermen used to regard the fisheries as a common pool resource just there for the taking. They were not concerned with productivity or sustainability. In other words, the fish are there to be harvested and the government is there to ensure that the resource system will continue. All this is now changing, after years of work in awareness-building and other management interventions, mainly undertaken by the government.

Today, the government and the coastal stakeholder community are at several places working together . The approach is consultative and participatory. It is community-based management in action to promote fisheries conservation. The stage has been set for even greater community participation in fisheries and coastal resource sustainability.

I hope you have each received a copy of two papers in your ACM package: “Emerging Trends and Prospects in Fisheries Management”, and “Stimulating Community Bonding among Stakeholders to Promote Management: An Example from Phang-Nga Bay, Thailand.”

Our Project is now at the stage where member countries can share learnings and experiences in fisheries management. This will benefit one and all and further the stakeholder approach to fisheries management. The new changing mind-set among our stakeholders is a healthy development and augurs well for the future.

The Mid-Term Evaluation of our Project, completed July last, recommended that BOBP and its member countries strengthen the Programme’s regional visibility. It also suggested activities to address transboundary problems affecting coastal resources, including of course fisheries. An early transboundary activity could be to strengthen the coordinated implementation of UNCLOS or the United Nations Convention on the Law of the Sea. An informal BOBP working group can be constituted from member countries to coordinate such activities. As UNCLOS is well accepted by BOBP member countries, its implementation would not be problematic. Such inter-governmental collaboration can lead to more effort in addressing other BOB transboundary issues and problems, such as Bay pollution from land-based sources.

Another potential area for collaboration centres on co-operation in reducing conflicts arising from transboundary resources. However, before any management of a transboundary resource problem or of transboundary character can be undertaken or even considered, management on a smaller localised scale must be shown to work and succeed in reversing resource over-exploitation or bringing about sustainable production. In other words, management on a larger geographical scale as in a Bay of Bengal large marine ecosystem (lme) calls for even greater political will and commitments. Our experiences in our pilot project sites as reported in the papers on “emerging trends and prospects in fisheries management” and community bonding show that we are well on the way to tackling transboundary issues and problems to come up with solutions on a regional level. Today, there is a greater willingness among fisheries policy-makers, administrators, planners

and managers to take an integrated and holistic approach to fisheries planning, management and development. This multi-sectoral approach reflects the growing shift in professional thinking behind government interventions in fisheries and coastal zone management. Such professional and managerial attitudinal change has brought about the emerging trends discussed in the two papers referred to earlier.

Many member governments have initiated incremental changes in their fisheries administrative structures. Once-unresponsive and once-unwieldy bureaucracies are now becoming more proactive, more people-centred and more ecosystem-based. There is today forethought rather than afterthought in fisheries management planning, a switch from conflict control after the event to conflict prevention through co-operation by bringing different stakeholder groups together.

Also evident is the growing number of national activities employing indirect methods rather than direct approaches to reduce fishing effort. This is partly because indirect methods of controlling fishing effort are relatively less difficult to implement, more acceptable and less disruptive of fishermen's daily lives. The hard punitive approach to enforcement is steadily giving way to a more humane, peer-pressure-driven, soft non-punitive approach.

Experiences in member countries show that fisheries management is not difficult to implement if we know how to operationalize it . . . the key is to start it first and work at it consistently. Provide fishermen the opportunity to experience it and be part of the process.

Information Service (GCP/RAS/117/MUL)

The Information Service provided active support to the core projects of BOBP during the year, through publications and promotion. Four issues of the quarterly newsletter, **Bay of Bengal News**, were produced and disseminated. Four technical publications were out (reports of the 21st and 22nd Advisory Committee meetings, the Maldives workshop on integrated reef resource management, a manual on fishes of the Maldives). Two more reports (on the carrying capacity of the Pulau Payar Marine Park, Malaysia and on the Workshop on Community-based Fisheries Management in Phang-Nga Bay, Thailand) are almost ready. Awareness materials on fisheries management included five posters - "Our sea, Our wealth", "A brief history of world commercial fishing", "A simplified mode! of how fish stocks can be managed", "Ghost fishing" and "Marine fishery resources in the Maldives". A 1998 desk calendar devoted to "Fisherwomen of the Bay of Bengal region", a 1998 pocket diary and T-shirts emblazoned with the motto "Save our seas" were also produced.

Department for International Development's Post-Harvest Fisheries Project

The second largest project under the BOBP umbrella deals with post-harvest fisheries. It is executed by the National Resources Institute (NRI) of the United Kingdom (UK) and supported by the Department for International Development (DFID) of UK at a level of US\$2.25 million over a five year period (1993-1998). The project, operating in Bangladesh, India and Sri Lanka, seeks to enhance the incomes of artisanal fishing communities and petty fish traders, increase the diversity of fish products marketed by these communities and strengthen the ability of NGOs to secure sustainable benefits from project activities. Based in Chennai, the project has set up regional offices in Kakinada, Andhra Pradesh and Dhaka, Bangladesh.

The project undertakes a broad-based approach to addressing the economic, institutional, social, technical and marketing needs of a wide target group amongst the rural coastal poor. It also promotes awareness-raising in post-harvest issues in the region and increased regional co-operation and communication. Its focus is on identifying solutions to post-harvest problems and assisting local government and non-government institutions and fisherfolk organizations to overcome these problems.

The project, which has worked with small-scale artisanal fisherfolk communities since 1987, is in the final phase. The termination of the project will also end a long and successful partnership with various government and non-government agencies working in the fisheries sector which has been crucial to the project's success and provided a vital mechanism for close interaction with fisherfolk communities. Project activities will be completed by March and the DFID office in Chennai will close in June 1998.

Cleaner Fishery Harbours Project (IMO) (EMP/RAS/830/MUL)

The Cleaner Fishery Harbours Project (CFH) set out with IMO sponsorship to help countries in the Bay of Bengal region to better manage their fishery harbours. The idea was to clean up harbours and ensure good working environments, pollute less and ensure that the fish was hygienic. The pilot effort in Sri Lanka has been completed. A National Workshop was held in Negombo to review the work of the project and to consider ways and means to extend the learnings of the project. To ensure the quality of its fish and fish products, and to retain its global competitiveness, Sri Lanka has embarked on a larger, donor-supported activity to strengthen quality assurance, with a large component addressing fishery harbour and landing sites concerns.

In the Maldives, the completion of the project has been delayed but the preparation of awareness materials is in the final stages. A National Workshop to review the project and give direction to extension of the project's learning is planned later in 1998. With that the pilot activity will be completed. Meanwhile, the project's Consultant, with the help of an FAO expert, has completed work on developing a manual for the region aimed at fishery harbour managers, to define learnings and provide guidelines. The manual is expected to be produced and ready for distribution within the next quarter. With the project coming to an end, and given the importance of the concerns being addressed, it would be appropriate for the Advisory Committee to consider ways and means of extending the methods evolved by the project to the region.

Concluding Remarks

In closing, BOBP is an instrument available to member and donor countries. It is for them to use it or not use it. Tremendous information and knowledge have been assembled. These must be put into the hands of the end users, to arouse, create, build and spread awareness.

The ideas promoted by the Programme are making an impact. One has only to go through the agenda of demands of Kanniyakumari fishermen, hear about fishermen joining government officers as volunteer enforcement wardens and sea rangers in Phang-Nga Bay, read what students in Maldives have to say about the reef resource, or notice the helping hand extended by fishermen to the authorities in Pulau Payar Marine Park, to realize that winds of change are blowing. Fishermen and other stakeholders are committed as much to resource sustainability as to their own welfare.

Fisheries management is a gradual process. It calls for attitudinal change. It calls for readiness to forego immediate benefits in exchange for long-term gains. It certainly demands a spirit of co-operation to replace one of competition, rivalry, antagonism or confrontation. When the various stakeholders become articulate, put forward ideas of their own, and stop regarding the government or other stakeholders as adversaries but as potential partners, the job of management is half done.

We have to travel much, much farther on the road to management. But the journey has begun, and roadblocks are being slowly removed. What offers hope and promise is that when projects or governments speak out, theirs are not voices in the wilderness. Others speak out as well, in support or dissent. The future lies in dialogue.

Appendix F

PROGRESS REPORT 1997 : COASTAL FISHERIES MANAGEMENT PROJECT

Project Factsheets

BANGLADESH: DOF-BOBP Coastal Fisheries Management Project

Functional Focus: Management of Estuarine Set-Bag Net (ESBN) and Push-Net (PN) Fisheries.

Geographical Focus: Coastal Districts of Bangladesh; **pilot efforts in Chittagong and Cox's Bazaar districts.**

Implementing Agencies: Marine Wing of the Department of Fisheries (DOF); Marine Fisheries Survey, Development and Management Project (MSDMP) of the DOF; and Fisheries Research Institute (FRI). (Approximately 43 staff)

National Project Coordinator: Mr Harun-or Rashid, Deputy Director in-charge, Marine Wing, DOF.

Project Objective: In the context of conserving coastal fish resources and ensuring the sustainability of coastal fisheries, to facilitate and enable improved management of the ESBN and PN fisheries in selected coastal areas of Bangladesh, through awareness building, strengthening the institutional capacity of concerned agencies and provision of technical assistance.

Background Note: A situation analysis undertaken by the DOF in 1994 identified the ESBN and PN fisheries as problem fisheries whose management needed immediate improvement. Their analysis was based on a very thorough bio-socio-economic analysis of the *P. monodon* fishery undertaken in a UNDP- supported activity during the 2nd Phase of BOBP.

The Problem: The ESBN is a traditional fishery which not only provides livelihood to a large population of mostly poor rural inhabitants, but also provides a sizable proportion of the marine and brackishwater capture fisheries production. The fishery provides most of the animal protein consumed by the rural poor. The ESBN fishery which interacts with at least seven other fisheries has been shown to be destructive, and could lead to growth and recruitment overfishing of several important marine and brackishwater species.

The PN fishery is of more recent origin, having evolved to supply Bangladesh's rapidly growing coastal aquaculture industry with *P. monodon* and *M. rosenbergii* fingerlings. The fishery is very destructive, because over 90% of its catch consists of by-catch, made up of commercially important species of marine and brackish-water organisms, which are discarded and left to die on the beach. The fishery not only provides over 95% of the seed requirement of the coastal aquaculture industry, which happens to be the second largest foreign exchange earner of Bangladesh, but also provides seasonal livelihood to several thousand poor people, most of whom are women and children. The Government of Bangladesh is under considerable pressure from trawler owners to ban the ESBN and PN fisheries as they feel that the fisheries are destroying their potential yields.

Chronological List of Activities Undertaken:

1995:

1. MOFL assigned the Marine Wing of DOF, MSDMP of DOF and FRI as implementing agencies; initiated development of Technical Assistance Plan Proforma (TAPP) to clear the activity; and, allocated staff and Taka 300 000 to help staff travel/subsistence, in anticipation of clearance of TAPP.
2. 35 staff of DOF/FRI were given an orientation to the BOBP project and approaches; and provided training in undertaking stakeholder identification, stakeholder analysis and stakeholder communications and perception

analysis, using participatory rapid appraisal methods. Staff designed and planned field work to undertake stakeholder studies.

3. DOF/FRI staff undertook stakeholder studies in six sample locations chosen as representative locations of ESBN and PN fisheries of coastal Bangladesh, over a two-month period, and documented their findings.
4. DOF/FRI staff used the findings of stakeholder studies, and in a workshop, undertook problem analysis and stakeholder problem perception analysis, to evolve a strategy and workplan to address the problems and concerns of stakeholders of the ESBN and PN fisheries. The workplan for 1996 was approved by DOF and MOFL and agreed to, in anticipation of clearance of the TAPP by Government.
5. BOBP in collaboration with the FAO (Japanese Trust Fund - RAS/138/JPN) and ODA (UK) supported MOFL and DOF to hold a National Workshop on Fisheries Resources Development and Management, which discussed the status and trends in fisheries in Bangladesh and recommended directions for the future.

Project Strategy: In the ESBN fishery the only available options to improve the management of the fishery are to reduce the fishing effort and attempt modification of the gear to make it less destructive. The possibility of achieving the latter seems difficult and more analysis is needed. The possibility of reducing effort, through closed seasons or closed areas not only depends on ESBN fishers and other stakeholders being aware of the need for, the benefits of and methods of management, but, more importantly, having alternative sources of income generation to ensure livelihood and food security. The project will focus on awareness building of stakeholders at all levels, promoting consultation and collective, negotiated decision making, in building the capacity of the DOF/FRI to undertake such efforts, and in undertaking a few pilot efforts of seasonal and area closure to test the feasibility of the idea and gauge the social and economic implications of such initiatives.

The ideal management option for the PN fishery would be to ban it. This option is impossible given the coastal aquaculture sector's dependence on it and given the number of poor men, women and children who make a living from it. The project hopes to influence policy through awareness building and consultation amongst stakeholders to work towards sustainable aquaculture, based on hatchery-produced seeds. Meanwhile, the project will focus on working with seed collectors and other stakeholders to reduce by-catch mortality and mortality in handling and transport of target seeds.

Fishing is only one part of the lives of the coastal peoples of Bangladesh. A variety of factors and actors, often far removed from fisheries, affect their food and livelihood security. The solutions to the fisheries management problem may well lie outside of the fisheries sector. A key strategy of the project will be to promote a more holistic and comprehensive policy perception that looks at the food and livelihood security of coastal peoples as a whole in determining options.

1996:

1. 36 DOF/FRI staff were trained in communications and in the mediation of consultations and negotiations.
2. Two one-day consultations were held with ESBN fishing communities to discuss problems and solution options.
3. 15 DOF/FRI staff undertook fieldwork to hold consultations with ESBN and PN stakeholders to evolve messages that need to be communicated to facilitate the DOF's management initiatives in the ESBN and PN sectors.
4. NGO/private sector group were identified to develop media and awareness materials to facilitate the management initiatives of the DOF and FRI in the ESBN and PN fisheries. SAVE, a private sector group, was shortlisted and a contractual service agreement was developed for the task.

5. MSDM project staff undertook a study to recommend locations and seasons where and when closures of the ESBN fishery can be tested in pilot efforts in the Chittagong and Cox's Bazaar districts.
6. A study was planned to identify alternative non-fisheries income generation options for ESBN fishers, to determine preliminary social and economic feasibility of the options and to evolve a strategy to promote such ventures. Discussions were held with NGOs capable of undertaking such a study and the study was designed.
7. 10 DOF staff and two staff of CODEC, the fisherfolk NGO, were trained in the design, planning and management of participatory exploratory fishing trials by an international consultant, Dr Marcel Giudicelli. The trained staff started to develop a project proposal to undertake a series of participatory exploratory fishing trials to identify alternative fishing income-generating options for ESBN fishers, which DOF and MOFL hope to put up to donors for support.
8. DOF with support from FRI initiated a review to document feasible technologies and methods to reduce by-catch mortality and to reduce mortality of target species through improved handling and transport techniques for extension to PN collectors.
9. BOBP made a special presentation to the Local Consultative Group of Donors in Fisheries in Bangladesh on the issues and concerns of marine and coastal fisheries sectors in Bangladesh.
10. A study to assess skill gaps and training needs in agencies concerned with the management of fisheries was discussed, the Terms of Reference was agreed to, and efforts were initiated to identify an institution or a group of consultants to undertake the study.

1997:

1. SAVE, a private sector organization active in extension, was contracted to produce awareness materials and media to support and facilitate management initiatives of DOF/FRI staff. Materials included poster exhibitions, audio tapes, comic books and radio programmes to be broadcast on Radio Bangladesh. The products of this exercise are expected to be ready early in 1998.
2. CODEC, the fisherfolk NGO, was contracted to conduct a study to identify non-fisheries income generating options for ESBN communities, determine their preliminary feasibility and propose a strategy to promote such ventures. The study was completed and a detailed report submitted to DOF and BOBP.
3. BOBP, DFID (UK) and MOFL organized a senior decision makers' consultation which will bring together Members of Parliament from coastal constituencies, Ministers and Senior Administrators and technical staff of ministries concerned with coastal development to discuss coastal people's food and livelihood security issues and concerns. (Reported in *Bay of Bengal News*)
4. DOF and FRI staff were trained in designing strategy and campaigns to implement management initiatives for ESBN and PN fisheries. The DOF/FRI staff prepared a detailed strategy, workplans and budgets for selected management initiatives for the ESBN and PN fisheries in selected areas of Chittagong and Cox's Bazaar districts, and submitted the proposals to MOFL and BOBP for support.
5. Planning was undertaken to organize a national workshop early in 1998, to build awareness on the precautionary approach to fisheries management and the Code of Conduct for Responsible Fisheries,
6. The Sr. Communications Adviser was deputed by FAO to prepare a proposal for funding by UNDP, addressing the food and livelihood security concerns of coastal fishing communities. The proposal, with empowerment of fishing communities as its basis, was prepared and submitted to UNDP and GOB for their consideration.

Assessment: The activities in Bangladesh are on schedule, progressing well in spite of delays in **some** components. The level of performance of the junior and middle level staff is high, and they are quite enthused about the project. The organizational culture of the department and the managerial environment is often not conducive to supporting innovative and creative efforts such as fisheries management. Fund shortages are a major constraint, which not merely makes national execution difficult but raises the question of post-project sustainability. The Marine Wing, responsible for implementation, does not have staff presence at the implementation level, namely the district and thana levels, and this will result in implementation problems. Testing of management initiatives will require issue of regulations, ordinances and notifications which can take time because of bureaucratic processes, and this can delay the project. Management initiatives, all of which depend on reduction of fishing effort, will succeed only if alternative income generation options exist and are accessible; initial indications are not very promising. Promoting alternative income-generating schemes is a complex and expensive task requiring skill training, credit support, managerial assistance and marketing help, and without the support of other government agencies and donors it will be difficult for BOBP and DOF to justice to this task. In spite of all these constraints and problems, a lot has been achieved in Bangladesh.

Bangladesh is the only member country of BOBP where BOBP's Coastal Fisheries Management Project and the DFID (UK)'s Post-Harvest Fisheries Project are working closely together, addressing the needs of the ESNB fisherfolk. At the senior decision-makers' consultation, MOFL announced the development of a comprehensive fisheries policy and proposed the establishment of a high-level, inter-ministerial task force, with the Prime Minister as Chairperson, to give direction to, coordinate and oversee coastal development, including development and management of marine and coastal fisheries. With MOFL taking increasing responsibility and gearing itself up for testing management initiatives, BOBP's role during the rest of the Project period will be reduced to conducting periodic reviews, providing technical assistance as required, documentation of the process and sharing the learnings of member countries' efforts through regional workshops and study tours.

INDIA: DOF/BOBP Coastal Fisheries and Aquaculture Management Projects

Functional Area:	in Tamil Nadu	coastal fisheries management/management of trawl fishery
	in Andhra Pradesh	coastal aquaculture management
	in Orissa	coastal fisheries management
	in West Bengal	coastal aquaculture management
Geographical Area:	in Tamil Nadu	Kanniya Kumari and Chennai Districts
	in Andhra Pradesh	East Godavari, West Godavari & Krishna Districts
	in Orissa	Baleshwar and Cuttack Districts
	in West Bengal	North 24 Parganas, South 24 Parganas & Midnapore Districts

Implementing Agencies: Departments of Fisheries of the states of Tamil Nadu, Andhra Pradesh, Orissa and West Bengal, in co-operation with the Central Marine Fisheries Research Institute and the Central Institute of Brackishwater Aquaculture.

Project Objective:

- 1. To enable and facilitate improved management of coastal fisheries in selected districts of the states of Tamil Nadu and Orissa,** through awareness building, strengthening institutional capacity of concerned agencies, and technical assistance.
- 2. To enable and facilitate improved coastal aquaculture management in selected districts of the states of Andhra Pradesh and West Bengal,** through awareness-building, strengthening institutional capacity of concerned agencies, and technical assistance.

Background Note: In 1994 the Central Marine Fisheries Research Institute (CMFRI), at the request of the Government of India (GOI) undertook a situation analysis of coastal fisheries along the east coast of India, identified and prioritised the problems, and proposed that the Governments of the States of Tamil Nadu and Andhra Pradesh improve the management of coastal trawl and fisheries and coastal aquaculture with assistance from BOBP. Early in 1995, after the 19th Meeting of BOBP's Advisory Committee had agreed to and endorsed the Situation Analysis proposal, the GOI suggested that the geographical scope of BOBP-assisted activities along the east coast of India be expanded to include the states of Orissa and West Bengal. At a workshop, which brought together representatives of GOI and the four east coast states, it was agreed that BOBP-assisted activities would focus on coastal fisheries management in the states of Tamil Nadu and Orissa and on coastal aquaculture management in the states of Andhra Pradesh and West Bengal.

The Problem: Small-scale fisherfolk dominate the fisheries along the east coast of India not only in terms of their numbers but also in terms of their contribution to the total catch. The larger-scale trawl fishery has expanded considerably in the last two decades, and there have been several instances of social conflict with small-scale fisherfolk, into whose area of operation the trawl fishery often intrudes. While production and catch rates of the-trawl fishery have shown no signs of decline, there are other indications – such as reduction in average sizes of species in the catch and changing species composition in catches-which suggest the need for management. There is also the concern of by-catch discards in the trawl fishery which is sizeable. Amongst the small-scale fisherfolk the picture is not very good. Catches have been declining, and with it earnings, in spite of increased prices of fish. The scarcity in resources, and the paucity of alternative options for income generation, has affected the quality of life of small-scale fishing communities adversely, creating a climate wherein conflicts often arise.

Coastal aquaculture, primarily for the culture of *P. monodon* developed rapidly along the east coast of India causing a variety of problems both environmental and social. Salinization of soil and groundwater, pollution due to water and soil disposal, disease problems, damage to mangroves, destruction of by-catch and destruction of wet-lands during collection of wild seed for culture, indiscriminate conversion of agricultural lands, and land use conflicts are some of the concerns that have arisen.

The state governments and the GOI, concerned with the status and trends in coastal fisheries and aquaculture, are committed to improving the management of the sectors to ensure sustainability of resources, conservation of the ecosystem and improving the quality of lives of coastal poor fisherfolk and fish farmers. Realising the complexity of the problems, and given the constraints they face in terms of manpower and resources, the governments are interested in addressing the problems comprehensively with the participation of the stakeholders.

Chronological List of Activities Undertaken:

1995:

1. A National Workshop of representatives of GOI, the states of Tamil Nadu, Andhra Pradesh, Orissa and West Bengal, and BOBP decided the scope and modalities of BOBP-assisted activities in India. Execution of the projects by the States, implementation modalities such as staff allocation, pilot area locations and project foci were discussed and agreed to.
2. GOI communicated the proceedings of the Workshop and the decisions taken to the four east coast states, seeking their formal support and commitment, and requesting them to incorporate the proposed projects into state plans and appropriate budget allocations into state budgets, to facilitate execution by the states
3. BOBP staff visited all four east coast states and had discussions with counterparts, visited pilot areas and had detailed discussions with selected stakeholders of the fisheries and aquaculture sectors. These visits and discussions generated a better understanding of the problems faced by the stakeholders and their causes
4. On the basis of the discussions with counterparts and stakeholders, and in anticipation of positive responses from the states, workplans for 1996 were drawn up and agreed to.

Project Strategy: The strategy in all four states was to identify the stakeholders, get to know them and about them, understand their perceptions of problems and solution options; and based on the findings, to determine and design awareness-building campaigns where necessary, and evolve workplans in consultation with the stakeholders to improve the management of fisheries and aquaculture. The strategy would also determine technical assistance needs if any, and address them through training and technical inputs. In a sense the strategy was process-oriented rather than goal-oriented, and based on participation.

1996:

In Tamil Nadu

1. 15 DOF staff from Chennai and Kanniyar Districts and four Catholic Priests of Kottar Diocese were given an orientation on the BOBP project and its approaches; and provided training in undertaking stakeholder identification, stakeholder analysis and stakeholder communications and perceptions analysis, using participatory rapid appraisal methods. The staff designed and planned fieldwork to undertake the stakeholder studies.

2. A one-day consultation was held with representatives of stakeholders of coastal fisheries in Kanniyar district to discuss their problems and solution options.
3. The participating DOF staff and the Catholic priests undertook six weeks of fieldwork in their respective districts to do the stakeholder studies. The final reporting and a planned workshop to discuss the findings of the stakeholder studies and to evolve a strategy and workplan for the future was delayed because staff were deployed for relief operations following a tropical cyclonic storm that hit Tamil Nadu.
4. A training programme for selected DOF staff on the design, planning and management of **participatory** exploratory fishing trials, by an international consultant, Dr Marcel Giudicelli, was cancelled because of delays in GOI clearance for the Consultant.

In Orissa,

1. 26 DOF staff from Cuttack and Baleshwar districts and two staff from DOF HQs were given an orientation on the BOBP project and its approaches; and provided training in undertaking stakeholder identification, stakeholder analysis and stakeholder communications and perceptions analysis using participatory rapid appraisal methods. The staff designed and planned field work to undertake the stakeholder studies.
2. A one-day consultation was held with representatives of stakeholders of coastal fisheries in Baleshwar and Cuttack Districts to discuss their problems and solution options.
3. The participating DOF staff undertook six weeks of fieldwork in their respective districts to do the stakeholder studies. The follow-up workshop to discuss the findings of the stakeholder studies and to evolve a workplan for the future was delayed because of scheduling problems and other pre-occupations of the staff.
4. 10 DOF staff were trained in the design, planning and management of participatory exploratory fishing trials, by Dr Marcel Giudicelli, international consultant.

In Andhra Pradesh,

1. 30 DOF staff from East Godavari, West Godavari, Krishna, Prakasam and Nellore districts were given an orientation to the BOBP project and its approaches, and to management of aquaculture to ensure sustainability; and provided training in undertaking stakeholder identification, stakeholder analysis and stakeholder communications and perceptions analysis using participatory rapid appraisal methods. The staff designed and planned field work to undertake the stakeholder studies.
2. A one-day consultation was held with representatives of stakeholders of coastal aquaculture in East Godavari and Krishna Districts to discuss their problems and solution options.
3. Fieldwork to undertake the stakeholder studies had to be indefinitely postponed, because all DOF staff were deployed for relief and rehabilitation work following the two severe cyclonic storms that devastated the Andhra Pradesh coast during a period of two weeks.

In West Bengal,

1. 29 DOF staff from Midnapore, South 24-Parganas and North 24-Parganas district were given an orientation to the BOBP project and its approaches and to management of aquaculture to ensure sustainability; and provided training in undertaking stakeholder identification, stakeholder analysis and stakeholder

communications and perceptions analysis using participatory rapid appraisal methods. The staff designed and planned fieldwork to undertake the stakeholder studies..

2. A one-day consultation was held with representatives of stakeholders of coastal aquaculture in North 24-Parganas and South 24-Parganas Districts to discuss their problems and solution options.
3. The DOF staff of North 24-Parganas undertook six weeks of fieldwork to do the stakeholder studies. The staff in the other two districts could not undertake the studies because of delays in receiving government orders, and had to postpone the studies to a later period.
4. A follow-up workshop for 27 DOF staff was held to discuss the findings of the stakeholder studies of North 24 Parganas district, and to evolve a strategy and workplan based on the findings. Staff of all three districts agreed to complete their stakeholder studies and develop district-wise workplans and budgets and submit them to DOF and BOBP for their consideration and support.
5. Staff in all three districts undertook a series of stakeholder meetings to determine the awareness and communications needs of the stakeholders, which could be used to evolve materials to assist the staff in implementing selected management initiatives.

In consultation with counterpart staff in the four east coast states and based on the preliminary findings of the stakeholder studies conducted, workplans for 1997 were evolved.

1997: General:

1. Review of BOBP activities in India with 20 senior fisheries officials from New Delhi and the East Coast states of Tamil Nadu, Andhra Pradesh, Orissa and West Bengal, at a meeting in Chennai on 19.08.97.
2. Visit to SENRIC (Delhi), Survey of India and Indian Institute of Remote Sensing (both in Dehra Dun) to discuss present GIS projects in the region and to obtain geographical data and permission to use coastal zone maps of India.

In TamilNadu,

1. A follow-up workshop was held for DOF staff of Chennai and Kanniya Kumari districts to discuss the findings of the stakeholder studies. The staff evolved a strategy and workplan for their future efforts with budgets, which were submitted to BOBP and DOF.
2. Strategies and work plans, evolved from the findings of the stakeholder studies in Chennai and Kanniyakumari, were discussed with the DOF. Discussions with DOF staff led to a strategy and workplan for their future efforts with budget estimates.
3. The DOF and the Government of Tamil Nadu allocated Indian Rupees 1 million to supplement the efforts of BOBP-assisted activities in Tamil Nadu for the financial year 1997-1998.
4. A training workshop on design, planning and implementation of participatory exploratory fishing trials was conducted for eight DOF staff, to enable them to facilitate diversification of fisheries programmes in the target districts.
5. A series of stakeholder meetings was held in the two districts by DOF staff to involve the stakeholders in a planning exercise to determine joint action to be taken for selected management initiatives.

6. At the request of DOF, a project proposal with budget was prepared for “Diversification of Fishing Effort for Inshore/ Coastal Fishermen to Tap Untapped/Under-tapped Offshore Pelagic Resources of Tamil Nadu for funding by the Government of India over a 5-year period.
7. DOF/TN initiated participation of BOBP staff in their monthly review meetings to facilitate awareness-building and regular interaction.
8. Discussions were held with the Secretary, Ministry of Fisheries and Animal Husbandry, TN, about the possibilities of helping fisherfolk communities in the non-fishery sectors, through catalytic action and coordination. The Secretary requested detailed, village-level need profiles in Kanniyakumari district to enable him to call an inter-ministerial meeting to progress the effort.
9. Two studies have been initiated in Kanniyakumari district in co-operation with the local church authorities. One is to collect village level socio-economic and infrastructure-availability data to develop non-fishery needs profiles. The other is to collect village-level fishery practices data to develop a GIS presentation to visualize the interactive nature of fishing, the intensity of fishing and the conflicts resulting from these. The information from the two studies will be used at a stakeholder meeting planned for March 1998 to discuss and plan participatory management initiatives in Kanniyakumari. Two workshops were conducted for volunteers from each village to train them in data collection for the studies. The fieldwork will be undertaken in January-February 1998.

In Andhra Pradesh,

1. A follow-up workshop was held for DOF staff of East Godavari, Krishna and West Godavari Districts to discuss the findings of the stakeholder studies. The staff, on the basis of the findings, evolved workplans for future actions, which included identifying one cluster of aquaculturists in each district who they can work closely with and help in working towards sustainable aquaculture.
2. DOF staff undertook fieldwork to identify and select a cluster of farmers in each district, using the same water source, and collected preliminary information on aquaculture and socio-economic aspects of the selected clusters.
3. A four-day training workshop was conducted on farming systems research, participatory rapid appraisal methods and collection of local and indigenous knowledge, for 9 DOF and NGO staff. The participants evolved a detailed workplan for conduct of FSR and PRA in the selected clusters, to get a better understanding of present aquaculture practices and problems. The fieldwork will be undertaken early in 1998, leading up to an expert consultation to determine guidelines for sustainable, small-scale coastal aquaculture.
4. BOBP staff visited DOF, National Remote Sensing Agency, and the State Remote Sensing Application Centre in Hyderabad to obtain information (IRS-C satellite data) for a possible GIS component in BOBP-assisted activities.

In West Bengal,

1. A seven-day training programme was organised at the Ramkrishna Mission Krishi Vigyan Kendra for 29 DOF staff to train them in improved participatory training and extension methods.
2. A one-day workshop was conducted, in which district-level and senior staff of DOF presented workplans and budgets for management initiatives in the three target districts. These were discussed and appropriately modified and submitted to the Government of West Bengal through the Director of Fisheries for their consideration and support.

In Orissa:

1. Field study on stakeholder perceptions and communications was undertaken by DOF staff trained at an earlier workshop (August 1997), and reported on.

At BOBP's headquarters in Chennai, the opportunity of FAO staff visiting from HQs in Rome was used to organise a series of seminars on a variety of subjects, in co-operation with local research and NGO institutions, and they included seminars on:

- * Emerging needs for Information Services in Fisheries
- * GIS as a Tool for Management of Fisheries and Aquaculture
- * Prevention of Disease and Health Management in Aquaculture
- * Safety at Sea
- * Changing Technologies and Reaching Rural Women
- * Quality Assurance Approaches in the Fisheries Sector
- * Cleaner Fishery Harbours and Fish Quality Assurance

In collaboration with the M S Swaminathan Research Foundation, BOBP organised a three-day Regional Workshop on the Conservation and Sustainable Management of Coral Reefs. The meeting brought together participants from India, the Maldives, Sri Lanka and regional agencies involved in reef conservation and management. Country papers were received from Bangladesh and Pakistan, though their participation was not possible. The meeting reviewed the status and trends of reefs and their utilisation and management in South Asia. It also discussed, around theme papers, a variety of subjects including research, monitoring, education and training, eco-tourism, law and policy pertaining to coral reefs. On the basis of group discussions, the participants evolved recommendations for strategies for conservation and sustainable management of reefs in the region.

Assessment: In spite of delays in implementation, partly due to natural calamities and partly due to delays in issue of government orders and other pre-occupations, it can be said with confidence that the staff are by and large committed to and interested in their work. Their performance has been good. In fact the quality of the work in some states has been outstanding, particularly because junior officers took the initiative and persuaded their senior staff to find ways around bureaucratic hurdles. National execution of the projects proceeded less smoothly. The states face severe financial constraints and have had problems even in providing travel and subsistence support to their staff. With the operational stage of the project at hand this situation may prove difficult. Tamil Nadu has taken the lead by generously allocating funds for the BOBP-assisted activities, and one hopes this will help in persuading the other states to follow suit. The other states feel that the government of India and BOBP will have to carry the bulk of the financial responsibility for the activities, unless the GOI takes the lead and comes up with alternative options to enable national execution.

In Orissa, due to several unavoidable reasons, progress has been very slow, and with the end of the project approaching it may not be possible to achieve anything of sustainable benefit. It may be worthwhile to close down the activity in Orissa and help the staff of DOF to learn from the activities and experiences of other Member Countries and that of Tamil Nadu in particular. In the three other states, management initiatives have been identified and planned, and implementation awaits government approval and support. BOBP's inputs over the rest of the project period would be to facilitate periodic reviews, provide necessary training inputs and technical assistance and enable sharing of learnings and experiences among Member Countries through regional workshops and study tours.

INDONESIA: DGF/PFS/BOBP Coastal Fisheries Management Project

Functional Focus: Community-based management of fisheries and mariculture.

Geographical Focus: Tapian Nauli Bay area in North Sumatra Province of Indonesia.

Implementing Agencies: Directorate General of Fisheries (DGF), Provincial Fisheries Service of North Sumatra Province (PFS), and concerned District Fisheries Services (DFS) in Tapian Nauli Bay area. (1 DGF, 6 PFS and 10 DFS staff)

National Project Coordinator: Mr Sihar Siregar, Chief, Sub-Directorate of Mariculture, Production Division, DGF supported by Mr Nasiruddin Siregar, PFS, North Sumatra at provincial level. **Project Objective:** In the context of evolving model fishing villages to undertake community-based fisheries management, to facilitate and enable improved management of mariculture, anchovy lift-net fishery and small-scale fisheries in the Tapian Nauli Bay area of North Sumatra Province, Indonesia, through awareness-building, strengthening institutional capacity of concerned agencies and provision of technical assistance.

Background Note: The PFS with support from the DGF undertook in 1994 a situation analysis which proposed that Indonesia with the assistance of BOBP would like to develop model management schemes for coastal fisheries and mariculture using participatory, community-based approaches to conserve and sustain coastal fisheries resources and improve the livelihood of fisherfolk. The government proposed a pilot exercise in the Tapian Nauli Bay area of North Sumatra Province, in the hope that the learnings of the exercise could be extended to other parts of Indonesia.

The Problem: Inadequate management measures and inappropriate enforcement mechanisms have resulted in conflicts between groups of fisherfolk. Fisheries stocks in coastal areas are under stress. Coastal areas often face conflict situations because of several users targeting the same resource. The recent development of mariculture has created problems such as wild seed collection using destructive fishing practices, unmanaged development of fisheries to generate feed for the mariculture sector, and pollution. Further, pollution of coastal areas from various land and sea-based sources is stressing coastal ecosystems. Fisherfolk incomes are low and there is concern about the quality of fish and fish products. The government realizing the complexity of such problems and given the constraints it faces in terms of manpower and resources, is interested in addressing the problems comprehensively through participatory approaches at the community level.

Chronological List of Activities Undertaken:

1995:

1. DGF designated the PFS of North Sumatra and the DFS of Sibolga and Tapian Nauli districts as the agencies responsible for implementing the BOBP-assisted activity. DGF incorporated fund allocations into their annual budget to cover necessary expenses beyond the assistance available from BOBP sources.
2. BOBP assisted the DGF in designing and developing a project proposal for submission to UNDP, which would supplement the limited resources of BOBP and DGF and support and complement the BOBP-assisted efforts. UNDP, however, was unable to support the project under its current finding cycle, and suggested that it be considered in its next cycle.
3. Selected DGF, PFS and DFS staff were trained in the conduct of stakeholder identification, stakeholder analysis and stakeholder communications and perceptions analysis. The staff designed and developed a study design to undertake stakeholder analysis.
4. A stakeholder consultation was organized by the DGF/PFS/DFS staff. It brought together representatives of stakeholders of all three target fisheries to discuss their problems and concerns and suggest solution options.

5. The PFS/DFS staff who had been trained undertook field work for a month to hold discussions with stakeholders and to conduct stakeholder analysis.
6. A workshop was held in Medan, North Sumatra, early in 1996, to discuss the findings of the stakeholder analysis and on the basis of the analysis to evolve a project strategy and workplan for the project. The project workplan was endorsed by DGF, PFS and DFS and commitments were made regarding responsibility and resource allocations to facilitate the project.

Project Strategy: A multi-pronged strategy was evolved on the basis of the stakeholder analysis. At the national level it was proposed that efforts had to be taken to build awareness and promote the concepts of community-based fisheries management and stakeholder approaches. At the local level, the approach was to build awareness on the need for, benefits of and methods of management amongst all stakeholders; promote and encourage consultation and negotiation amongst and between stakeholders to arrive at management plans; and provide technical inputs to enable more sustainable practices in the fisheries. The overall approach was to take the participatory consultative route wherein solutions and strategies would emerge from consultations amongst stakeholders. Central to the strategy was the idea of generating viable technical solutions to promote sustainability in fisheries and mariculture.

1996:

1. The National Workshop on Community-based Fisheries Management had to be postponed. BOBP had hoped that the Japanese Trust Fund in FAO RAS/I 38/JPN) would support the effort as it had done in Bangladesh, Thailand and Sri Lanka. DGF and BOBP are committed to the activity and will jointly organize it early in 1998.
2. Preparatory efforts were undertaken to design a study to review institutions, legislation and regulations in the Tapian Nauli Bay area level, with a view to recommend necessary changes to facilitate participatory community-based management efforts. TORs were developed and candidates identified to undertake the study.
3. The activities relating to improving the management of mariculture, anchovy lift-net fishery and small-scale fisheries depended on BOBP identifying and assigning consultants to study the problems of the sectors and evolving technical inputs based on technology extension, training and fisherfolk manuals. The activities were postponed as appropriate consultants could not be identified and assigned. DGF and BOBP agreed that the related awareness building and consultative approaches should be postponed in order to have on **hand** the technical inputs to give direction to the efforts.
4. Selected staff of PFS and DFS were trained in the conduct of the regional study of values, perceptions and attitudes of fisherfolk and other stakeholders towards fisheries resources, fishing practices, and fisheries management. The questionnaire was translated into Bahasa Indonesia and the staff planned their fieldwork to be conducted in the Tapian Nauli Bay area.

1997:

1. A study to review institutional and regulatory frameworks to facilitate participatory community-based fisheries management was assigned to a group of national consultants and the report of the study is expected later in the year when it will be discussed at a national workshop.
2. A technical consultant for providing technical assistance to the anchovy lift-net fishery in terms of improving the quality of processed anchovy on-board the fishing craft and on land has been identified with the help of DOF, Malaysia and the consultant's assignment is expected in the near future.

3. The fieldwork for the study of values, perceptions and attitudes of fisherfolk and other stakeholders has been completed. The questionnaires were checked and edited. BOBP staff conducted an orientation in the processing of questionnaires into ready-made information for analysis.
4. Efforts were made to collaborate and link PFS/DGF/BOBP model fishing village work with the Kampung Nelayan Indonesia project in the province.
5. Preparations were also made to organize a national workshop on sea-farming technology in mid-1 998 with the support of NACA.

Assessment: While the activities in the project have been delayed due to difficulties in identifying and assigning consultants, considerable groundwork has been done, which has given DGF and BOBP a better understanding of the problems. The DGF is very interested in the progress of the activities and has given high priority to solving the problems of mariculture, anchovy lift-net fishery and small-scale fisheries.

MALAYSIA: DOF-BOBP Coastal Fisheries Management Project

Functional Focus: The promotion of sustainable coastal zone management approaches for marine parks, as productive ecosystems contributing to fisheries production.

Geographical Focus: Pulau Payar Marine Park, Kedah

Implementing Agencies: DOF in the State of Kedah/Perlis and the DOF in Kuala Lumpur, in association with other national and state government agencies of Kedah and Perlis, representatives from EPU, Environment, Forestry, Universities (UPM and USM), fisherfolk, NGOs and WWF.

National Project Coordinator: Mr. George C.M. Chong, DOF

Project Objective: In the context of sustainable coastal zone management, to facilitate and enable development and testing of methods and approaches to improving the conservation and management of marine parks, in a pilot effort in Pulau Payar, near Langkawi Island, off the coast of Kedah and Perlis.

Background Note: In 1994 Malaysia undertook a situation analysis of their fisheries and coastal resources. The analysis recommended a sustainable resource management approach to emphasize the importance of marine parks as productive ecosystems contributing to fisheries and biodiversity.

The problem: A variety of development efforts have contributed to degradation of coastal resources, including destruction of mangroves for land reclamation and conversion into brackishwater aquaculture, agriculture development, rapid expansion of tourism, and destruction of seagrass beds and coral reefs.

Chronological List of Activities Undertaken:

1995:

1. Key stakeholders have been identified and include fisherfolk (primary targets), industry and hotel owners, fish vendors and middlemen, landowners, and Langkawi area Port Authority and developers.
2. The awareness activity objective has been developed; to create an understanding and acceptance among key stakeholders of the need for and benefits of integrated coastal resource management, to enable their collaboration in management as stewards of the local resources.
3. The Special Area Management Plan (SAMP) monitoring objective was developed; to observe whether the Marine Park and areas managed under the SAMP can increase or sustain fisheries resources in the Park waters and surrounding areas.
4. A five-year Workplan was developed which regularly will be reviewed and revised.

Project Strategy: During the first year it was decided to experiment with local-level integrated coastal area management through the implementation of a SAMP.

The DOF is approaching SAMP development through a two-tiered process: Tier I and Tier II committees. During the first tier, the DOF is developing a consensus-based preliminary draft SAMP. This preliminary draft will be used as a platform for discussion, during the second tier, when all the key agencies with jurisdiction in the coastal zone will be brought together, through consensus, to develop the detailed SAMP with consultations at each step in the process with fisherfolk and other resource users and stakeholders. The schedules and terms of reference for the committees were established. The Tier I Committee consists of the DOFM Aquatic Ecology Branch, Marine Parks Branch, Sector Planning Branch and Resource Management Branch. The Tier I Committee was initiated in mid- 1995 and worked closely with

the area stakeholders and State agencies to further assist in the project design, guide the scientific characterization studies, public outreach activities, and institutional review, and draft a skeleton SAMP. The draft SAMP is completed in May 1997.

1996:

1. The SAMP is currently being developed by the Tier I Committee with advisory inputs from BOBP.
2. DOFM/BOBP arranged for key staff in SAMP development and implementation to undergo training in Integrated Coastal Zone Management (ICZM) in Rhode Island (RI), and visits to several ICZM field projects in RI during the training.
3. Forty fisher-folk candidates have been identified for alternative livelihood skills training in ecotourism (a diving course and a eco-guide/ natural history course). The purpose of the training is to enable small-scale fisherfolk to start their own businesses. The programme for the first training has been completed.
4. Preparations for a local ICZM Workshop for Tier II are under way. The Workshop will be held in the second part of 1997 and is to present an overview of the ICZM SAMP process and build a consensus among the Tier II Committee representatives on the objectives and issues of management. The draft Tier I SAMP will be presented to the Tier II Committee.
5. The methodology for conducting the scientific characterization studies was developed along the description of activities, time frame and budget. The interactive approach to develop the study was a useful SAMP planning tool.
6. Five DOF staff from the IPP are conducting the scientific characterization work. The early findings will be presented at the ICZM Workshop in 1997. The ongoing results of this work, together with the results from the socio-economic survey, will form the information base used for SAMP decision-making.
7. The report on the visitor-carrying capacity of Pulau Payar Marine Park has been completed.
8. A socio-economic baseline survey instrument for the SAMP area was developed and translated into Bahasa Malaysia.

1997:

1. Survey orientation and training of DOFM/ Kedah staff (fieldwork orientation, training in the survey objectives, interview techniques and sampling methodology/frames) undertaking the socio-economic baseline study, which complements the scientific study by providing measurements of change in area communities with SAMP implementation.
2. Survey orientation and training of DOFM/ Kedah staff undertaking the VPA study of fishermen in Kedah as part of the regional assessment of Values, Perceptions and Attitudes of fisheries stakeholders.
3. ICZM Workshop prospectus has been drafted and circulated for comments.
4. In August 1997 BOBP assisted in the organization and participated in two workshops held in Kuala Lumpur for senior staff of the Department of Fisheries and from the State Department of Fisheries. The first workshop was on 'Precautionary Approach to Fisheries Management', the second on 'Stakeholder Approaches to Fisheries Management' and on information needs for CBM and strategic planning for facilitation of CBM. In his opening speech, Dato Mazlan Jusoh, Director-General of the DOFM, very clearly articulated a shift in

the policy of DOFM from strict enforcement based on top-down approach to fisheries management to a more participative approach, tentatively known as CBM.

5. From 20-22 October 1997, a DOF Workshop on Integrated Coastal Zone Management was held in Alor Setar. The Workshop was organized to show the results from various impact studies of selected management initiatives and the establishment of the 'Pulau Payar Marine Park' (SAMP) in coastal areas of Kedah. Results of the scientific characterization of the marine and coral reef ecosystem were also shared with the participants. The results were corroborated by some of the work by "Universiti Sains Malaysia" in Penang. BOBP assisted in the organization and participated in the workshop. Further, BOBP presented preliminary findings of the baseline socio-economic survey, which was conducted by a survey team including DOF and BOBP staff.
6. On 26-28 November 1997 a regional workshop on 'Smart Partnership for Sustainability in the Fishing Industry' was held in Penang. BOBP assisted in the organization and participated in the workshop. This regional workshop was jointly sponsored by a Canadian NGO, Institute on Governance. Resource persons were drawn from Australia (2), Canada (1) and Denmark (1).

Assessment: National execution is proving to work in Malaysia. Funds from the Malaysian Treasury are being made available to top up the BOBP budget to implement workplan activities. Interest in fisheries management is high, particularly in consultative and participating management (read CBFM). Even so, some delay is experienced in scheduling of activities due to other pressing government work.

MALDIVES: MOFA-BOBP Coastal Fisheries Management Project

Functional Focus: Integrated Reef Resources Management

Geographical Focus: Maldives, with a particular focus on Vaavu, Meemu, Faafu and Dhaalu Atolls.

Implementing Agencies: The Ministry of Fisheries and Agriculture (MOFA) and the Marine Research Section of MOFA, in close co-operation with other concerned government agencies. (Approximately 8 staff members.)

National Project Coordinator: Mr Ahmed Hafiz, Deputy Director, Marine Research Section, MOFA

Project Objective: Enable and facilitate the development of a model for participatory, atoll and island community-based, integrated reef resources management, in a pilot exercise focusing on Vaavu, Meemu, Faafu and Dhaalu Atolls, through awareness building and consultation, strengthening the institutional capacity of concerned agencies and provision of technical assistance.

Background Note: In 1994 the Ministry of Fisheries and Agriculture (MOFA) determined that the third phase effort of BOBP should assist MOFA in developing an economic-ecological model for island and atoll community-based integrated reef resources management, that could then be extended to the rest of the country, in the context of the National Integrated Reef Resources Management Programme. This decision grew out of BOBP's 2nd phase extension activity in the Maldives which, working in the same pilot area as chosen for the third phase, had evolved into a participatory resource management effort. The efforts of MOFA during the 2nd phase BOBP activity and subsequent to it had also helped to identify the major issues that needed to be addressed:

- * reef fishery (particularly the grouper fishery for export in live form and the collection of aquarium fish, also for export)
- * live bait fishery in the reef area, for the tuna pole and line fishery
- * mining of coral and sand for construction purposes
- * interaction between the tourism and fishery sectors.

The Problem: Reefs are central to the people of the Maldives for their very security from the forces of nature. Reefs are also an important factor in the livelihoods of island peoples as they provide natural resources for construction and trade. In the recent past, without the benefit of formal management processes, the people have seen their reef resources being stressed and even depleted, particularly in the cases of the giant clam and beche-de-mer fisheries and through extraction of coral and sand for construction purposes. The government and the people are very concerned about these developments and about possible conflicts that may emerge amongst users of reef resources. The people have expressed their interest in participating in efforts to sustainably manage their resources, and this interest helped evolve a BOBP 2nd phase extension activity into a participatory reef resources management activity. In the cases of new and developing fisheries, such as the grouper fishery for live-fish export and the fishery targeting aquarium fish, the private sector and the government are keen about management and a shift to more sustainable options such as mariculture, provided such efforts are preceded by environmental impact assessments and accompanied by sound management. The pole and line tuna fishery is the mainstay of the fisheries of the Maldives, and there is concern that its growth and development will be affected by live bait availability in the reefs. The tourism sector in the Maldives is the major earner of revenue and foreign exchange and the government and the tourism sector are very aware that tourists are drawn by the beautiful reefs of the country; problematic interactions between fisheries and tourism activities and any degradation of the reef resources could jeopardize the sector's development. In this context the government has developed a National Integrated Reef Resources Management Plan to address these concerns.

Chronological List of Activities Undertaken:

1995:

1. MOFA designated the MRS as the agency responsible for the implementation of the BOBP-assisted activity. A team of staff from MRS and MOFA was assigned to undertake the project work and firm fund allocations were made in MOFA's budget to enable national execution of the project.
2. Four MRS staff were trained in undertaking stakeholder identification, stakeholder analysis, and stakeholder communications and perceptions analysis.
3. An extended field trip was undertaken to the four pilot atolls for discussions with stakeholders about the orientation of the project and to ascertain the needs and concerns of the communities in the context of IRRM.
4. Preparatory activities were undertaken to hold a National Workshop on Integrated Reef Resources Management to build awareness, seek co-operation amongst stakeholders and give direction to the process of IRRM.

Project Strategy: The primary strategy of MOFA was to hold a National Workshop on Integrated Reef Resources Management early in 1996. This workshop would bring together MOFA and MRS staff, senior representatives of all concerned government departments, representatives of stakeholder groups, and selected experts from all over the world, to deliberate and come up with a strategy and with methods and approaches by which the country and the project could evolve the IRRM programme. Further, given the geographic remoteness of the islands, and their tradition of autonomy, the government is committed to a consultative and participatory approach to IRRM. MOFA hopes that the pilot effort in the four atolls will provide valuable learnings to give direction to an a&country effort.

1996:

1. A five-day National Workshop on Integrated Reef Resources Management was held in Male, which brought together MOFA and MRS staff, senior representatives of all concerned government departments, representatives of stakeholder groups, and selected experts from all over the world, and evolved recommendations and a draft strategy.
2. MOFA and MRS used the recommendations of the workshop to develop a workplan for the high priority actions necessary to follow-up on the recommendations, a draft management plan, and a draft IRRM implementation framework.
3. The draft plan and framework was forwarded to the Fishery Advisory Board, the highest ministerial-level authority to guide fisheries policy and action in the Maldives, for approval. The Fisheries Advisory Board approved of the documents with minor changes.
4. The plan and framework documents were translated into Dhivehi to facilitate the initiation of the implementation process.

1997:

1. BOBP and MOFA/MRS staff undertook an extended field trip to four pilot atolls for discussions with Atoll Chiefs and Atoll Development Committees to determine the priorities of each atoll and to evolve implementation modalities and mechanisms.

2. Atoll Chiefs and Atoll Development Committees, based on formats suggested by MOFA and MRS, agreed to initiate data collection in a geographical format to facilitate future decisions. These data are being maintained at Atoll level and communicated regularly to MOFA and MRS.
3. MOFA and MRS have developed a sector-by-sector precautionary management plan, based on the best available information and on information collected at Atoll level, and these plans will be presented to a workshop in February 1998. The Workshop will bring together technical staff from all concerned departments, Atoll Chiefs, Atoll Development Committee representatives and MOFA/MRS staff to come up with a agreed-to plan of implementation for IRRM and proposed coordination and cooperation mechanisms to facilitate implementation.
4. *Fishes of the Maldives*, an identification catalogue of economically useful species found in Maldivian waters, was designed and developed by MRS and has been published by BOBP and MOFA.
5. MRS and BOBP have published a poster on "Life on a Coral Reef", as an awareness building tool to be introduced into every classroom in the Maldives.
6. Preparatory efforts are under way to design a study to document traditional and local knowledge on fisheries and natural resources management, which could give direction to the IRRM efforts. A non-governmental organization to undertake the study has been identified and the TOR and workplan are being developed to facilitate issue of a contractual service agreement.
7. A proposal is being developed for establishing a GIS database to facilitate the implementation of the IRRM programme, which MOFA and MRS are in the process of setting up. A note on GIS use in IRRM has been distributed for discussion and possible future action.
8. Preparatory efforts are under way to establish an Atoll Learning Centre in Meemu Atoll to facilitate awareness building. As a part of this exercise, the awareness materials development capacity of MRS will be upgraded. Plans and budgets are being evolved for action during 1998.
9. Preparatory activities were undertaken to organize a national workshop on precautionary approaches to fisheries management and the Code of Conduct for Responsible Fisheries. The workshop will be held in Male in February 1998.

Assessment: MOFA and MRS in collaboration with BOBP have embarked on a process, which on the one hand is complex and difficult and on the other politically sensitive. Natural resources management involves ownership and use-rights issues that will have to be evolved in the context of tradition and present political practice, and this is necessarily a slow process, MOFA and MRS have limited staff and resources and this may pose a problem for the project's implementation. MOFA and MRS are committed to the activity and are evolving strategy through a participatory and consultative process that does not lend itself to quick and easy solutions. There is visible progress in change of attitudes and in the perceptions of stakeholders. Mechanisms and modalities are being slowly but surely developed. The project stands a good chance of setting in motion a process that may well have considerable and important impact, though one may not see the establishment of a clear-cut management regime within the life span of the project. The BOBP-assisted activity is well merged into the national plan and the sustainability of the effort seems assured.

SRI LANKA: DFAR-BOBP Coastal Fisheries Management Project

Functional Focus: Management of ornamental fish sector.

Geographical Focus: Sri Lanka, with particular focus on southwest coast, from Puttalam to Hambantotta.

Implementing Agencies: Department of Fisheries and Aquatic Resources (DFAR) (Fisheries Management Division) in co-operation with National Aquatic Resources Agency (NARA). (Approximately four staff supported by district level DFAR staff, as required.)

National Project Coordinator: Mr H. V. C. Fernando, Deputy Director of Fisheries, DFAR

Project Objective: In the context of conservation of critical aquatic habitats such as coral reefs, lagoons, mangroves, sea grass beds, estuarine and riverine systems and sustainable resources utilization from such habitats, **to facilitate and enable improved management of the ornamental fish sector of Sri Lanka**, through awareness building, strengthening the institutional capacity of concerned agencies and provision of technical assistance.

Background Note: A situation analysis conducted by DFAR in 1994 identified the ornamental fish sector as a problem fishery whose management was considered a high priority need. Not much information exists about the ornamental fish sector and there are no data to suggest that any of the stocks are under stress or in danger. However, the government set a high priority to the management of the sector because:

- * Given that ornamental fish live in and are collected from some of the most vulnerable environments such as coral reefs, mangroves, lagoons, estuaries and sea grass beds, there is concern in Sri Lanka about the future sustainability of its rich aquatic resources. Several NGOs express concern that activities such as collection of ornamental fish are destroying the country's biodiversity and putting the environment and the people to risk.
- * Several government agencies have mandates that oversee wildlife, environment and natural resources utilization, and there have been conflicting legislation, rules and regulations evolving out of different agencies to address the same concern. The government felt the need to rationalize the process to promote a more coordinated approach to the multi-disciplinary problem.
- * DFAR was of the opinion that the lessons learnt from improving the management of the ornamental fish sector would guide and give direction to processes to improve the management of larger and perhaps less organized fisheries that target food fish.

The Problem: The problem in the ornamental fish sector needs to be looked at on two levels. First, given that little is known about the populations or the biology of the species, some of which are endemic to Sri Lanka and rare, there is a genuine concern that indiscriminate collection would stress the populations and eventually push them towards extinction. There is also the related question of how these delicate creatures are collected; luckily toxic substances and explosives do not seem to be used in Sri Lanka, though some of the gear and methods used to collect fish, such as 'moxy' nets, are not eco-friendly. Secondly, and less well known, is the problem of human activities and the impact they have on habitats of ornamental fish. A wide range of activities including deforestation, agriculture, the mining of coral for lime and cement, food fisheries, sewage and garbage dumping, industrial pollution and tourism have direct and indirect effects on the habitats, most of which are detrimental. Given this scenario, only managing the collection of ornamental fish may prove futile, even if successfully implemented, if no attention is paid to the quality of the habitats which recruit and provide a home for the creatures concerned. In practical terms the management of the ornamental fish sector is complicated by the fact that several government agencies are involved and they would need to work in concert to come up with a rational and cohesive programme of management.

Project Strategy: The stakeholder analysis suggests that while a lot of differences exist in terms of perceptions of problems and solution options there is a clear commonality, in that all parties feel that they stand to benefit in the long term from a programme that ensures the sustainability of the resources and the habitat. The central aim of the project will be to promote consultations and negotiations amongst and between stakeholder groups in order to arrive at a negotiated management plan. Such a participatory development of a management plan will hopefully lead to participatory implementation, monitoring and enforcement of the agreed plan. To aid and assist the consultation process two parallel activities are planned. One, to add to the knowledge of the sector in terms of the status and trends of the resources and the habitats to provide the stakeholders with the “best available” scientific information to help them in their decisions, and, two, awareness building on the need for, the benefits of and the methods of management amongst all stakeholders.

Chronological List of Activities Undertaken:

1995:

1. MFARD designated DFAR and NARA as the primary agencies responsible for implementation of the BOBP assisted effort. The activity was incorporated into the National Fisheries Development Plan of Sri Lanka 19952000, and the government earmarked a budget of 0.5 million SRL Rupees into the Fisheries Plan to facilitate national execution of the project.
2. Four staff of NARA were trained in undertaking stakeholder identification, stakeholder analysis and stakeholder communications and perceptions analysis. The studies could not be undertaken partly due to the situation prevailing in the country and partly due to manpower shortages which resulted in staff being preoccupied with other priorities.
3. Preparatory work initiated to develop identification catalogues in the form of laminated cards, posters and ring-bound catalogues of ornamental fish whose export is either banned or restricted, to facilitate enforcement and to build awareness.
4. One-day stakeholder consultation held with selected NGOs interested in and concerned with the ornamental fish sector. NGOs agreed in principle to participate actively in the management process.
5. The Project developed a working relationship with a NAM-implemented project, supported by the Marine Conservation Society (MCS) of UK and funded by the Darwin Initiative, which also addresses the management needs of the marine ornamental fish sector. BOBP and Project staff participated in a National Workshop on Management of Marine Aquarium Fisheries and Conservation of Coral Reef Biodiversity of Sri Lanka, organized by NARA and MCS.
6. BOBP assisted FAO in developing a project proposal, “Development of Integrated Fisheries Resources Management in Sri Lanka”, as a follow up to a National Workshop on Community-Based Fisheries Management held in Colombo in 1994.
7. The Programme Coordinator of BOBP organized a workshop on “Prioritization of Research in Fisheries” for MFARD, DFAR and NARA staff around a presentation made.
8. BOBP and Project staff undertook stakeholder analysis by meeting representatives of concerned government agencies, the live fish exporters’ association and the ornamental fish breeders’ association. The stakeholder analysis findings gave direction to development of a project strategy and detailed workplans for the year 1996.

1996:

1. A study to review and document existing data and literature and to acquire local and expert knowledge of the status and trends of resources and habitats in the ornamental fish sector of Sri Lanka was planned and potential candidates to undertake the study were identified and shortlisted.
2. Based on regulations issued by MFARD which specify species of ornamental fish whose export is either banned or restricted, a local artist/diver was contracted to illustrate all the species. NARA and DFAR undertook the task of putting together information about each of the species, including notes on identification, local names, biology and population and habitat characteristics. The first priority was given to producing identification catalogues in the form of loose-leaf binders for the use of Customs officers.
3. BOBP made available the “Fishbase”, a database on CD-ROM produced by FAO and ICLARM, to DFAR to facilitate their identification and management efforts.
4. BOBP and DFAR conducted a two-day Orientation Workshop on Fisheries Management for all middle and senior level staff of MFARD and its associated agencies, including District Fisheries Extension Officers.
5. A study to assess the skill gaps and training needs of agencies concerned with fisheries management was planned. Discussions were held with the UNDP-FAO National Project on Fisheries Management and a joint exercise was agreed to. Suitable institutions and consultants to undertake the study are in the process of being identified.

1997:

1. BOBP and MFARD conducted a stakeholder consultation to bring together senior administrators and technical staff of 15 government agencies, interested in and concerned with the management of the ornamental fish sector, to discuss issues and concerns and invite suggestions on how to improve coordination and cooperation in the sector’s management.
2. Study on Status and Trends of Ornamental Fish Resources and Habitats was commissioned, to be undertaken by a senior staff member of the University of Colombo.
3. The Live Fish Exporters Association of Sri Lanka have established a fund to support research and development efforts in aid of improved management of the ornamental fish sector, and hope to build up the fund by charging a cess of US 50 cents on each box of ornamental fish exported. The fund already has approximately US\$ 3000.
4. Preliminary discussions were held with the Live Fish Exporters Association of Sri Lanka about the need for and the modalities of undertaking a SWOT study of the industry to guide its development into the future.
5. 12 staff of DFAR were trained in the conduct of a regional values, perceptions and attitudes study of fisherfolk and other stakeholders towards fisheries resources, fishing practices and fisheries management.
6. DFAR mounted a multimedia campaign to invite collectors and divers in the ornamental fish sector to register themselves with their local fisheries offices, to enable DFAR to hold district-wise stakeholder consultations with the divers and collectors.
7. DFAR and BOBP conducted a one-day meeting with ornamental fish divers and collectors in the Colombo area, to better understand their problems and elicit their views on solution options.

8. DFAR (with help from NARA) finalized the identification catalogue of ornamental fish for use by the Flora and Fauna Task Force of Sri Lanka Customs. The ring bound volumes were handed over to Sri Lanka Customs by DFAR.
9. DFAR and BOBP conducted a one-day meeting with ornamental fish divers and collectors in the Negombo area, to better understand their problems and elicit their views on solution options. An important issue that came up was the mobilization of the divers into an association or a union to represent their interests.
10. DFAR and BOBP held discussions with leading insurance companies about the possibility of developing custom-designed insurance schemes for accident and life coverage of divers. With the cooperation of MFARD, insurance schemes have been initiated for fisherfolk and divers.

1998:

1. MFARD organized a meeting of the stakeholders of the ornamental fish sector. The meeting resulted in a recommendation to the Hon. Minister to request the Cabinet to establish a high-level, inter-ministerial task force to evolve policy and strategy for conservation and management of critical aquatic resources and habitats and to coordinate and oversee conservation and management efforts.
2. BOBP co-sponsored a trade fair and a seminar to promote the development and management of the ornamental fish sector with MFARD and the Live Fish Exporters Association of Sri Lanka.
3. Planning initiated to develop an illustrated comic book on safety practices for ornamental fish divers.
4. Planning initiated for the development and production of water-resistant ornamental fish identification cards, illustrating the species whose export is either prohibited or restricted. -
5. Planning initiated to develop short training courses for divers in safe diving practices.

Assessment: The prevailing situation in Sri Lanka has not only resulted in disruptions of work and delays but has also drastically affected fund availability to BOBP's counterpart agencies. This has resulted in delays in implementing the project. The other concern is an acute shortage of trained manpower in fishery agencies, particularly in sections concerned with fisheries management. While efforts at building capacity are ongoing, the very act of training often deprives the agency of necessary staff during the periods of training. However, given the government's concerns with fisheries resources and development and the enthusiasm of the stakeholders to ensure some sort of a sustainable future, it is fair to expect that concern will translate into policy and action. MFARD has taken an important step, at the request of the stakeholders, and proposed the establishment of a high-level task force to oversee and coordinate the conservation and management of critical aquatic resources and habitats. However, given the multi-sectoral nature of the problem, progress may be slow and will need facilitation and support. With the establishment of the task force, BOBP's role will reduce to periodic review, provision of technical assistance and training inputs, particularly to the divers. With adequate capacity-building inputs to DFAR and technical assistance to the task force, a more sustained national effort towards conservation and management of ornamental fish resources and habitats is expected.

Thailand: DOF-BOBP Coastal Fisheries Management Project

Functional Focus: The development of community-based participatory approaches to the management of fisheries and aquaculture, in a coastal zone context.

Geographical Focus: Phang Nga Bay along the Andaman Sea coast of Thailand

Implementing Agencies: DOF, NGO, University.

National Project Coordinator: Mr. Jate Pimoljinda, Director, Andaman Sea Fisheries Development Center, Phuket.

Project Objective: In the context of sustainable coastal zone management, to facilitate and enable improved community based fisheries management in the pilot location of Phang Nga Bay, by establishing marine parks, deploying village-based artificial reefs, and better enforcement through improving people's awareness and participation.

Background Note: Thailand's situation analysis identified the following issues both within and outside of the fisheries sector in Phang Nga Bay: utilization of harmful fishing practices, reduction in demersal catch, overexploitation of both pelagic and demersal fisheries, changes in species composition, difficulties in enforcement, degradation of the fisheries habitat, pollution caused by sedimentation, increased nutrients and industrial sources, conflicts between small-scale and large-scale fisherfolk. As a microcosm of Thai fisheries, Phang Nga Bay displays almost all the problems encountered in the country. The Government is keen on developing management approaches facilitated by: establishment of marine parks; deployment of village-based artificial reefs, and better enforcement through improving people's awareness and participation.

The problem: The rapid and dramatic development of the fisheries industry in Thailand over the last few decades has resulted in several problems, including stressed pelagic and demersal stocks, deterioration of fisheries resources and their habitats, conflicts between fisherfolk, between various gear and between capture and culture fisheries, and environmental degradation of fisheries habitats due to waste discharge from aquaculture, industry and tourism. The government has taken various steps to address some of these problems by limiting entry to the trawl fishery, licensing, etc.

Chronological List of Activities Undertaken:

1995:

1. The first year of the DOF/BOBP Third Phase saw development of the objective, design and early implementation of a Community-Based Fisheries Management (CBFM) Project in Phang Nga Bay as to the issues identified by the situation analysis.
2. The following activities listed in the 3-year Workplan were completed (1) Define Initial Area (2) Obtain Consensus on Management Objectives (3) Identify and Obtain Consensus on Village Fishery/ Coastal Resource Problems, and (4) BOBP/DOF CBFM Workshop.

Project Strategy: Site visits identified key fisherfolk leaders for representation and participation in the CBFM, initial geographic area and issues for management. The initial area for management was defined as 11 villages on the eastern side of the Bay. However, the DOF/BOBP CBFM Workshop conducted in February 1996 generated enthusiasm among neighboring villages in the Bay and the project area was expanded to include the CBFM of the entire Bay .

1996:

1. The DOF/BOBP CBFM Workshop was held in February. Fifteen technical papers were presented at the Workshop, and fisherfolk experiences in management initiatives were presented and discussed at several sessions. Participants included fisherfolk, village leaders, government officials, NGOs, Universities, BOBP and FAO. It was the first time that fisherfolk met with government officials to plan fisheries management.
2. The Workshop report and proceedings were edited and sent to the printers.
3. Five individuals who have key roles in implementing CBFM completed a two-week training in ecosystem management at the international workshop 'Creative Approaches to Managing Bays and estuaries' in Sarasota, Florida, US. Reports of the experience were drafted by the study tour participants and sent to BOBP and the donors.
4. Building fisherfolk groups as the local-level CBFM management structure was identified at the Workshop as an important activity for early implementation. CBFM fisherfolk groups or working committees were established in over 10 villages in the Bay.
5. Further strengthening the livelihoods of fisherfolk within the villages is another activity identified at the Workshop to strengthen fisherfolk groups. Training in boat engine maintenance and repair was given to 20 fisherfolk in Ban Bang Can, one of the 10 villages with an established working committee.
6. Early action for CBFM implementation during the remainder of 1996 was identified during the CBFM meetings every two months (i.e. bi-monthly) with DOF, NGO, and the village CBFM working committees of Phang Nga Bay. These include: (a) resource management and rehabilitation; and (b) development of approaches for enforcing the push net and trawl ban.
7. Actions included releasing *Penaeus* spp. in five villages of the Bay. This activity is ongoing and is being rotated between Bay villages.
8. Mangrove and seagrass area rehabilitation implemented. Seagrass beds and mangrove areas under rehabilitation and protection were identified by placing notification boards to inform area residents of the activity.
9. The strategy for achieving compliance with the trawl and push net ban, and discouraging harvest of gravid female crabs started, combining awareness, enforcement and economic incentives:
 - a. cages were established in four villages to place gravid female crabs mistakenly caught by fisherfolk. These were used by fisherfolk, and once the crabs release their eggs, the crabs were sold. The profits were used for village CBFM activities.
 - b. approximately 40 pushnets were reported to continue operations in the Bay. To encourage greater compliance of the pushnet ban, gillnets were offered to the fisherfolk if they traded in their pushnets.
 - c. Results of a study quantifying juvenile fish abundance in seagrass area of the Bay before and after the pushnet ban were being compiled into awareness materials.
10. During a bi-monthly CBFM meeting, fisherfolk requested evaluations by representatives to be held every six months instead of the yearly evaluation originally agreed upon. The first evaluation was held in October 1996. Results included a consensus on additional activities to address environmental issues and conservation.

1997:

1. Public hearings (bi-monthly) continue to be held with fisherfolk in the Bay, with more and more suggestions for resolving problems of resource degradation and pollution.
2. Bimonthly meetings were held in three provinces to share experiences and provide a forum for new ideas and initiatives. T-shirts and jackets were distributed among fisherfolk. This initiative was sponsored by the Phuket Chamber of Commerce and the Government of Thailand.
3. Awareness and public education outreach billboards were posted to improve information dissemination among Phang Nga Bay people.
4. Spawning cages constructed to let female gravid crabs spawn before marketing the animals as an important conservation measure.
5. Shrimp and fish seeds were publicly released by fisherfolk themselves in the Bay.
6. Rehabilitation work done on denuded mangrove areas and seagrass beds (mangrove re-planting scheme).
7. Training **and** orientation on Regional Survey and Study on the Values, Perceptions and Attitudes of Fisherfolk and Coastal Stakeholders towards Ownership of Fisheries and its Exploitation, Management and Sustainability.

Assessment: As awareness is high and still growing rapidly in the Bay communities, DOF/BOBP activities are well received and participated in. Much of the groundwork has been laid by DOF and NGOs working in the Bay. Impact of these activities is beginning to pay off-fleet size of trawlers and pushnet boats is steadily declining, to cite one example

Appendix G

Indicative BOBP Regional Workplan for 1998 - 1999: Coastal Fisheries Management in the Bay of Bengal

Activity Number	Activity Description	1998												1999											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A	SHARING OF LEARNINGS FROM NATIONAL AND REGIONAL EXPERIENCES AND PILOT ACTIVITIES SUPPORTED BY BOBP (Two Stages - Stage 1 - 1998 Documentation Stage 2 - 1999 Transfer of Learnings) 1. Conflict Resolution in Fisheries and Suggested Management Options 2. Fisheries Diversification and Alternative Income Generating Opportunities in and outside Fisheries 3. Fish Sanctuaries and Marine Parks Development in Fisheries Management 4. Ornamental Fisheries and Emerging Industry for Small-scale Coastal Fisherfolk and its Management 5. Integrated Reef and Coastal Zone Management for Sustainable Fisheries.																								
B	REGIONAL THEMATIC WORKSHOPS AND TRAINING 1. Evolving a Self-Financing Scheme and Mechanisms for Fisheries Management 2. Planning and Formulating an Integrated Fisheries Management Plan with Emphasis on Community-Based Management System 3. Fisherfolk Leadership Training in Representation and Negotiation Skills 4. Farming Systems Research, Extension and Development for Food Security and Resource Sustainability																								
C	EXTENSION AND TRAINING MANUALS ON PARTICIPATORY APPROACHES TO FISHERIES MANAGEMENT AND PLANNING 1. Management in Stressed Fisheries: Why, What and How? 2. Promoting Participatory Fisheries Management Through Stakeholder Consultation and Analysis 3. Logical Framework for Planning, Monitoring and Evaluation to Strengthen Fisheries Management																								
D	REGIONAL/NATIONAL STUDY TOURS AND SITE VISITS 1. Community-Based Fisheries Management Systems a. Thailand b. Malaysia																								
E	TERMINAL REPORT PREPARATION I. Terminal Evaluation, if desired by donors 2. Consolidated Report of Findings and Outputs																								
F	POST-ADVISORY COMMUNITY MEETING THEMATIC WORKSHOP (Topics to be decided in consultation with member countries)																								

(Note: Two months must be allowed for wrap-up of activities, **printing of publications**, closing of inventories and equipment still in working order to be sold or donated to government agencies with FAO/UN and donor concurrence)

INDIA, TAMIL NADU : Indicative Workplan for 1998-1999

Geographic Area: Chennai and Kanniyakumari Districts of Tamil Nadu

Programme Area: Improvement of management of trawl fishery and coastal fisheries

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	Awareness-building and consultation with stakeholders on: - need, benefits and methods of fisheries management - alternate fishery option-diversification - offshore fishing options - participatory fisheries management and enforcement - socio-economic status of fisherfolk	- Consultation with stakeholders to prioritize problems and to come up with solutions options - conceptualize and develop awareness materials	- Facilitation and assistance
2	Plan and where possible initiate selected management activities such as - offshore fishery access -diversification of fisheries	- Plan and initiate implementation of selected activities in consultation with stakeholders - funds, logistics and staff support	- Technical assistance in planning/implementation
3	Establish M&E System for Project	- logistics, materials and staff support	- facilitation and assistance - village level socio-economic and infrastructure status study - development of geographic information to visualize fishing practices, interactive nature of fisheries, intensity of fishing and conflicts - log frame and M&E Workshop
4	Assess Training Needs and Skill Gaps of DOF to facilitate capacity building	- logistics, materials, staff support - Workshop to discuss study outcome and recommend capacity building strategy	- Consultant input to undertake study
5	DOF facilitation of coordinated actions among government departments for fisheries and fisherfolk welfare	- Coordination meeting at high level - follow up to coordinate, overview and enable actions	- facilitation/assistance
6	Closure and Reporting	- Reporting - Extension of Learning - Recommendations for future	- facilitation, assistance

INDIA, WEST BENGAL : Indicative Workplan for 1998-1999

Geographic Area: Midnapur, South 24-Paraganas and North 24-Paraganas districts of West Bengal

Programme Area: Improved management of Coastal Aquaculture

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	Awareness and consultation amongst stakeholders on needs for, benefits of and methods of sustainable aquaculture practices	<ul style="list-style-type: none"> - Mass meetings with fish farmers and stakeholders with travelling exhibits - development and dissemination of awareness materials - extension of awareness campaign 	<ul style="list-style-type: none"> - Assistance in development of awareness materials - facilitation
2	Development of guidelines on sustainable coastal aquaculture for small farmers	<ul style="list-style-type: none"> - farming systems analysis of culture in selected clusters of farms - assistance in development of guidelines - extension and dissemination of guidelines 	<ul style="list-style-type: none"> - training of staff in farming system research - expert consultation to evolve guidelines - facilitation/assistance in developing guidelines in the form of illustrated comic book/production
3	Initiation of management options to improve management of coastal aquaculture	<ul style="list-style-type: none"> - Support to plans developed by DOF staff with stakeholders in terms of funds, logistics and staff support 	<ul style="list-style-type: none"> - facilitation and assistance in awareness materials and training of staff
4	Development and establishment of M&E system for Project	<ul style="list-style-type: none"> - logistics, materials and staff support 	<ul style="list-style-type: none"> - M&E trainings and Development Workshop
5	Closure and Reporting	<ul style="list-style-type: none"> - Reporting - Extension of Learning - Recommendations for the future 	<ul style="list-style-type: none"> - facilitation/assistance

INDIA, ANDHRA PRADESH : Indicative Workplan for 1998-1999

Geographic Area: East Godavari, West Godavari and Krishna Districts of Andhra Pradesh

Programme Area: Improved Management of Coastal Aquaculture

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	Awareness and consultation amongst stakeholders on needs for, benefits of and methods of sustainable aquaculture practices	<ul style="list-style-type: none"> - Mass meetings with fish farmers and stakeholders with travelling exhibits - development and dissemination of awareness materials - extension of awareness campaign 	<ul style="list-style-type: none"> - Assistance in development of awareness materials - facilitation
2	Development of guidelines on sustainable coastal aquaculture for small farmers	<ul style="list-style-type: none"> - farming systems analysis of culture in selected clusters of farms - assistance in development of guidelines - extension and dissemination of guidelines 	<ul style="list-style-type: none"> - training of staff in farming system research - expert consultation to evolve guidelines - facilitation/assistance in developing guidelines in the form of illustrated comic book/production
3	Initiation of management options to improve management of coastal aquaculture	<ul style="list-style-type: none"> - Support to plans developed by DOF staff with stakeholders in terms of funds, logistics and staff support 	<ul style="list-style-type: none"> - facilitation and assistance in awareness materials and training of staff
4	Development and establishment of M&E system for Project	<ul style="list-style-type: none"> - logistics, materials and staff support 	<ul style="list-style-type: none"> - M&E training and Development Workshop
5	Closure and Reporting	<ul style="list-style-type: none"> - Reporting - Extension of Learning - Recommendation for the future 	<ul style="list-style-type: none"> - facilitation/assistance

BANGLADESH: Indicative Workplan for 1998-1999

Geographic Area: Selected coastal areas of Chittagong and Cox's Bazar districts.

Programme Area: Management of estuarine set-bag net (ESBN) and push net (PN) fisheries.

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	<p>Awareness-building and consultation with stakeholders on</p> <ul style="list-style-type: none"> - status of fisheries, impacts of fishing need for, benefits of and methods of management - Need for seasonal reduction of ESBN fisheries in selected location - Preferred fishing seasons and locations based on abundance of <i>P.monodon</i> fry - Need for, benefits of and methods of reducing mortality of by-catch and increasing quality of <i>P.monodon</i> fry 	<p>Organize consultations with</p> <ul style="list-style-type: none"> - ESBN fishers/PN Fisheries - policy makers - awareness campaign amongst ESBN fishery stakeholders in support of closed season initiative - awareness campaign amongst PN stakeholders to reduce by-catch mortality and increase quality of <i>P. monodon</i> fry - broadcast of radio programmes on radio BGD - distribution of comic book and audio cassette 	<ul style="list-style-type: none"> - Production and dissemination of communication materials developed by SAVE - Training of DOF/FRI staff in media campaign planning and use of communication materials - National Workshop on PA2FM and CCRF
2	<p>Identification and promotion of alternate fishery income options for ESBN fisherfolk</p>	<ul style="list-style-type: none"> - design and develop detailed proposal for exploratory fishing trials; seek fund support from government and donors and plan for implementation 	<p>Facilitation</p>
3	<p>Review and document methods and techniques to improve fry handling and transport, and identification of optimal methods</p>	<p>DOF/FRI to undertake review in collaboration with aquaculture industry; TOR; undertake activity; report</p>	<p>Assistance in planning</p>
4	<p>Initiate implementation of pilot seasonal closure of ESBN fisheries in selected areas of Chittagong and Cox's Bazar districts</p>	<ul style="list-style-type: none"> - issue regulations to facilitate pilot closure - extension effort with awareness campaign - enforcement in co-operation with district/thana staff of DOF - logistics, funds and staff support 	<ul style="list-style-type: none"> - Training of DOF/FRI staff in extension/communication/participatory enforcement to facilitate campaign
5	<p>Initiate implementation costs of pilot management initiatives in selected areas of Chittagong and Cox's Bazar</p>	<ul style="list-style-type: none"> - issue regulations to facilitate pilot activities - extension effort with awareness campaign - enforcement in co-operation with district/thana staff - logistics, funds and staff support -Technology transfer as recommended 	<p>Training DOF/FRI staff in extension/communication/participatory enforcement to facilitate campaign.</p>
6	<p>Assess performance of management initiatives through establishment of Project M&E System</p>	<p>Organize logistics, materials and staff support and implement M&E System</p>	<p>Technical Assistance/National Workshop on M&E</p>
7	<p>Closure and Reporting of Activity</p>	<ul style="list-style-type: none"> - Reporting of Activity - Extraction of Learnings - Recommendation for future activities 	<ul style="list-style-type: none"> - Facilitation and Technical Assistance

MALAYSIA : Indicative Workplan for 1998-1999

Geographic Area: Malaysia

Programme Area: Integrated Management of Pulau Payar Marine Park

	Activity	1998												1999											
		J	F	M	A	M	J	J	A	S	C	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1	Special Area Management Plan																								
	a. Fisheries Working Group (FEG) Reporting to and Input from Tier I Committee.																								
	b. Fisheries Working Group (FWG) Meeting and Briefing State Planning Unit*																								
	c. Workshop for Direct Stakeholders on Results of October 1997 Workshop																								
	d. Finalization of SAMP with State Coordination Committee (SCC) e. Implementation of SAMP with SCC and Other Stakeholders																								
2	Hydroacoustic Coral Reef Survey and Mapping (RoxAnn/Colour Echosounder System)																								
	a. Co-ordinating Planning and Negotiating Terms with Contractor																								
	b. Mobilisation (eg booking DGPS)																								
	c. Field Survey																								
	d. Digitisation of Maps, and Tracks using GIS Techniques in FRI/DOFM																								
	e. Report Generation (Coral Classification, substrate maps, live/dead coral distribution; distribution of fish)																								
	f. Joint Report Writing and Presentation																								
	g. Publication of Report																								
3	Synthesis and Integration of Data																								
	i. Water Quality Parameters																								
	ii. Indicator Species																								
	iii. Results of (2) above																								
	iv. Others																								

* as preparatory to the formation of the State Co-ordinating Committee (SCC)
Tier I Committee: National Advisory Council for Marine Parks
Tier II Committee: State Co-ordination Committee (SCC)

Fisheries Working Group is the executing group in the DOFM that uses existing administrative mechanism for reporting to the top Management Meeting that meets monthly and comprises the Heads of the Marine Park Section, Resources Management Section and Director of Research.

MALDIVES: Indicative Workplan for 1998-1999

Geographic Area: Maldives (Vaavu, Meemu, Faafu and Dhaalu Atolls)

Programme Area: Integrated Reef Resources Management (IRRM)

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	<p>Atoll and Island Level Implementation IRRM</p> <p>Field Work on IRRM Processes and framework with Stakeholders</p> <p>(a) conduct meetings in Atoll to reach consensus on an adaptive management framework</p> <p>(b) establish membership of committees, roles and responsibilities for local elders/leaders and individuals</p> <p>(c) framework session to prioritize recommendations for action</p> <p>(d) arrange schedule for prioritized actions and commitment for implementation</p> <p>(e) travelling roadshow of posters between atolls</p> <p>(f) Fisherman's Day - BOBP stall</p> <p>(g) Establish Community Learning Centre in Meemu</p>	<p>Organize logistics, materials</p> <p>Facilitate and lead meetings, identify key stakeholders at atoll and island level, and help to ensure that they are represented in process</p> <p>Assist in preparation of relevant materials.</p> <p>Assist in preparation of relevant materials</p> <p>Organize logistics materials and support mechanism in MRS</p>	<p>Resource person(s) for presenting approach! framework options</p> <p>Help to identify follow-up required as next steps to ensure sustainable framework and potential areas of concentration for MRS in its support to the framework and process</p> <p>Develop strategy for involving the continued participation of local level government officials and bridging the gap between government and stakeholders</p> <p>BOBP to prepare relevant materials in cooperation with MRS</p> <p>BOBP to set up stall in cooperation with MOFA</p> <p>BOBP? to prepare and provide relevant assistance and materials</p>
2	<p>Document existing knowledge of marine resources and management systems, in order to provide a sound foundation for IRRM, including traditional systems</p>	<p>Identify local candidate for conducting assessment</p>	<p>Co-fund local expert, review and advise on methodology</p>
3	<p>Initiate establishment of regional data collection and M & E system in Pilot Areas</p>	<p>Organize, implement and provide necessary staff support</p>	<p>Workshop on M&E for staff and stakeholders; assist in organization and implementation</p>
4	<p>Identify other IRRM Recommendations in Draft Collaborative Management Plan for 1998-1999 implementation</p> <p>- Finalize Precautionary IRRM plan for 2 atolls</p>	<p>Finalize all work</p>	<p>BOBP to review and finalize in consultation with MRS/MOFA</p>

SRI LANKA: Indicative Workplan for 1998-1999

Geographic Area: Western and Southern Coast of Sri Lanka

Programme Area: Facilitating and enabling improved management of the Ornamental Fish Sector

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS
1	Promote formulation of Management Advisory Committee for Ornamental Fish Sector to facilitate, enable, oversee and coordinate improved management	<ul style="list-style-type: none"> - Establish inter-ministerial task force on conservation and management of critical aquatic habitats - Develop precautionary management plan for sustainable management of ornamental fish resources and habitats in consultation with stakeholders - Develop and issue appropriate regulations and ordinances to facilitate management of habitats and resources - Implement and Enforce Plans 	<ul style="list-style-type: none"> - National Workshop on Logframe Analysis and M&E Systems - Technical Assistance in development of strategy and planning - Facilitation of consultation with stakeholders and mediation of negotiations
2	Awareness-building amongst stakeholders on the need for, the benefits of and methods of participatory management of ornamental fish sector	<ul style="list-style-type: none"> - logistics, staff support, dissemination and technical inputs - develop and produce comic book on conservation and safety for divers and collectors of ornamental fish - promote campaign to build awareness amongst general public and tourists on habitat conservation and improved management of resources 	<ul style="list-style-type: none"> - produce and disseminate ornamental fish identification cards to facilitate enforcement - facilitation, assistance - facilitation, assistance
3	Review and documentation of status and trends of ornamental fish resources and habitats	Complete study and share learnings in a workshop with a view to evolve research strategy to fill gaps in knowledge	- facilitation, assistance, inputs on research strategy formulation
4	Awareness-building and strengthening capacity of ornamental fish divers with a view to promote participatory management	<ul style="list-style-type: none"> - training of selected groups of divers on conservation and safety in diving - assistance to strengthen association of divers 	- facilitation, assistance
5	Reducing pressure on marine ornamental fish resources through promotion of breeding and culture of coral reef species	<ul style="list-style-type: none"> - identification of technology options - facilitation of technology transfer - promotion of breeding and culture in-country 	- facilitation
6	Establishment of M&E System for Project	- logistics, materials, staff support	<ul style="list-style-type: none"> - Workshop/Training on M&E - assistance
7	Closure and Reporting	<ul style="list-style-type: none"> - Repotting of Activity - Extension of Learning - Recommendation for future activities 	- facilitation and technical assistance

THAILAND: Indicative Workplan for 1998-1999

Geographic Area: Phang Nga bay, along the Andaman Sea coast of Thailand.

Programme Area: Development of community-based participatory approaches to the management offisheries and aquaculture in a coastal zone context.

	Activity	1998												1999											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1	Bi-monthly Public Hearings and Sharing of Learnings and Experiences a. Open water stocking b. Mangrove/seagrass replanting and rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	Develop Long-Term Policy on Territorial Use Rights in Fisheries (TURF) a. Workshop on TURF and Implications i. define and clarify use rights in fisheries ii. continue stock assessment and data analysis iii. determine zoning criteria and propose boundary mapping and zoning scheme b. Workshop on CCRF and PA2FM	<i>(To be scheduled in consultation with counterparts)</i>																							
3	Implement Activities under CSA on CBFM a. Continue Conservation Campaign and Surveillance	_____																							
4	Develop and Implement Monitoring Plans for CBFM Using Scientific and Economic Indicators	_____																							
5	Periodic Visits to Review Progress of work	<i>(Based on Need)</i>																							

INDONESIA: Indicative Workplan for 1998-1999

Geographic Area: Tapian Nauli Bay in North Sumatra province of Indonesia.

Programme Area: Community-based management of fisheries and mariculture.

S.No	ACTIVITY	COUNTRY INPUTS	BOBP INPUTS	REMARKS
1	<p>SMALL-SCALE FISHERIES Translation and Modification of Manual on Stakeholder Approaches to Fisheries Management Preparation for: - National Workshop on Community-Based Management of Fisheries</p> <p>Review of Fisheries Management Related Regulations and Legislation</p>	<p>- Initiate translation and editing</p> <p>Develop TORs and document traditional systems found in North Sumatra, Aceh, Lampung, Djambi etc.</p> <p>PFS staff undertaking review</p>	<p>- BOBP to produce on completion in 1998</p> <p>Conceptualize and design workshop, identify sources for funds, develop prospectus, identify resource persons and initiate assignment and development of materials. BOBP to print study on completion</p>	<p>National Execution</p> <p>BOBP to provide author's contrac and assist in documentation</p>
2.	<p>MARICULTURE Preparation for: - National Workshop on Sea Farming</p> <p>Guidelines for Sustainable Grouper Cage Culture</p> <p>Mangrove Replanting</p>	<p>Develop preliminary TORs and prospectus Search for similar guidelines from Singapore, Taiwan or Thailand and adapt to Indonesian conditions Source mangrove seedlings and other preparatory activities to kickstart replanting initiative</p>	<p>BOBP, NACA and INFOFISH to collaborate and provide support and resource persons. Assist in search for available manual</p> <p>Assist in launching of initiative and share experiences from Phang-Nga Bay. Provide VDO tape on replanting</p>	<p>National Execution</p> <p>National Execution</p>
3	<p>ANCHOVY/LIFT NET FISHERY Improved on-Boat and on-Shore Handling and Processing of Anchovy for Quality Product</p>	<p>Modify TOR and identify consultant for assignment</p>	<p>Recruit and assign consultant as per revised TORs</p>	<p>BOBP to determine if TCDC consultant available</p>

CFMINS

Appendix H

PROJECT INPUTS AND THEIR UTILIZATION

1. GCP/RAS/1 SO/DEN & : Coastal Fisheries Management
 GCP/RAS/151/JPN
 Donors DANIDA, Government of Japan
 Budget US\$3,000,000 from 1994 - 1999

2. GCP/RAS/117/MUL : Information Service
 Donors Member countries
 Budget US\$ 90,000 per year

Table 3 gives details of budget and expenditure

Table 1: GCP/RAS/150/DEN
 Budget and Expenditure (US \$)

<i>Code</i>	<i>Object of Exp.</i>	<i>Budget</i> 1994-98	<i>Est. Exp.</i> 1994-97	<i>Est. Exp.</i> 1998	<i>Balance</i>
10	Personnel	1,079,928	882,941	159,000	
20	Duty Travel	162,000	126,514	35,000	
30	Contracts	32,730	22,730	10,000	
40	Hospitality	4,295	-1,705	6,000	
50	Supplies		-3,577		
	Subtotal	1,278,953	1,026,903	257,050	
90	Servicing cost	166,264	133,497	28,210	
	Unspecified	54,783			
	Grand Total	1,500,000	1,160,400	245,210	94,390

Table 2: GCP/RAS/151/JPN
Budget and Expenditure (US \$)

<i>Code</i>	<i>Object of Exp.</i>	<i>Budget 1994-98</i>	<i>Est. Exp. 1994-97</i>	<i>Est. Exp. 1998</i>	<i>Balance</i>
10	Personnel	346,000	265,492	100,000	
20	Duty Travel	22,002		15,000	
30	Contracts	210,000	79,481	55,000	
40	Gen.Ope.Exp.	161,435	55,862	38,000	
50	Supplies	150,000	-20,001	30,000	
60	Equipment	100,000	42,058	25,000	
80	Fellowship/Training	360,000	147,939	80,000	
	Subtotal	1,327,435	592,833	343,000	
90	Servicing Cost	172,565	77,068	44,590	
	Grand Total	1.500.000	669,901	387,590	442,509

Table 3: GCP/RAS/117/MUL
Budget and Expenditure (US \$)

<i>Code</i>	<i>Object of Exp.</i>	<i>Deposits 1987- 97</i>	<i>Expenditure 1987- 97</i>	<i>Est. Exp 1998</i>	<i>Balance</i>
10	Personnel		450,675	30,400	
20	Duty Travel		56,464	15,000	
30	Contracts		72,470	20,000	
40	Gen.Ope.Exp.		26,580	10,000	
50	Supplies		16,305	5,000	
60	Equipment		498	—	
81	Fellowship/Training		15,212	20,439	
	Sub-Total		638,204	100,839	
90	Servicing cost		31,910	5,042	
	Grand Total	989,765	670,114	105,881	213,770

Table 4
PUBLICATIONS, 1997

Newsletter, Bay of Bengal News

Vol II, No 5, March 1997

Vol II, No 6, June 1997

Vol II, No 7, September 1997

Vol II, No 8, December 1997

Reports

- 1 . BOBP/REP/75 Report of the 2 1st Meeting of the Advisory Committee
- 2 . BOBP/REP/76 Workshop on Integrated Reef Resources Management in the Maldives. Male, Maldives, 16-20 March, 1996.
- 3 . BOBP/REP/77 Report of the 22nd Meeting of the Advisory Committee. New Delhi, India, 23-24 September 1997,
4. BOBP/MAG/21 Fishes of the Maldives
5. BOBP/REP/79 Assessment of the Carrying Capacity of Pulau Payar Marine Park, Malaysia.

Awareness materials on fisheries management

* *Five posters were prepared and produced:*

1. "Our sea, our wealth"
2. "A brief history of world commercial fishing";
3. "A simplified model of how fish stocks can be managed"
4. "Ghost fishing"
5. Marine resources of the Maldives.

* *1998 desk calendar*

* *1998pocket diary*

* *"Save our seas " T-shirt.*

Table 5
Professional Staff - 1997
(GCP/RAS/150/DEN, GCP/RAS/151/JPN, GCP/RAS/117/MUL)

International Officers

	<i>Designation</i>	<i>Name of Incumbent (country)</i>	<i>Date of (month/year) Arr.</i>	<i>Dep.</i>
1.	Programme Coordinator	Chong, Kee-Chai (Malaysia)	12/94	
2.	Communication Adviser	Roy, R (India)	01/95	
3.	Fishery Resource Economist (Associate Professional Officer)	Verduijin, R J C (The Netherlands)	10/96	
4.	Geographical Information Systems (Associate Professional Officer)	Bierhuizen, B (MS) (The Netherlands)	12/96	

International Consultants

	<i>Designation</i>	<i>Name of Incumbent</i>	<i>w/m</i>
1.	Fishery Harbours	Ravikumar, R India	
2.	Fishery Harbours	Sciortino, J Malta	0.25
3.	Precautionary Approach to Fisheries Management	Preston, G USA	0.25

Table 6
Supporting Staff - 1997
(GCP/RAS/150/DEN, GCP/RAS/151/JPN)

Administration

Scurville, S (Ms)	Sr. Admin Assistant
Sivashanmugam, P M	Sr. Driver

Information Service **

Madhu, S R	Information Officer (Consultant)
Amalore. E	Artist (Consultant)

Secretarial Service

Verghese, C (MS)	Secretary
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*** Costs covered by GCP/RAS/117/MUL*

Table 7
Training, Seminars and Workshops 1997

No.	<i>Subject</i>	<i>Duration Days</i>	<i>Venue</i>	<i>No of Participants (Country)</i>
1.	Follow-up Workshop for DOF/TN Staff to Discuss Findings of Stakeholder Studies and to Evolve Strategy / Workplan for Action	4	Chennai TN, India	14 (IND)
2.	Chennai District Stakeholder Consultation	5 x 1	Chennai TN, India	145 (IND)
3.	Kanniyakumari District Stakeholder Consultation	11 x 1	KK District TN, India	300 (IND)
4	Follow-up Workshop to Discuss Funding of Stakeholder Studies for DOF/AP Staff and to evolve Strategies and Workplan for Action	4	Kakinada AP, India	37 (IND)
5	Training of DOF/BFDA/WB Staff in Participatory Training and Extension Methods	7	Nimpith WB, India	29 (IND)
6.	Training of PFS/DFS Staff on the Conduct of VPA Study in Sibolga	2	Medan NS, Indonesia	12 (INS)
7.	Senior Government Stakeholder Consultation on Management of Ornamental Fish Sector	1	Colombo Sri Lanka	48 (SRL)
8.	DFAR Staff Training on Conduct of VPA Study in Sri Lanka	1	Colombo Sri Lanka	12 (SRL)
9.	Regional Workshop on Precautionary Approach to Fisheries Management	4	Medan NS, Indonesia	26 (All Countries)
10.	GOI/ BOBP Workshop to Review CFM. India activities	1	Chennai, India	20 (IND)
11.	Seminar on HACCP and Fishing Harbours	1	Chennai, India	25 (IND)
12.	Training of DOF/TN/ Staff in Commercial Exploratory Fishing	8	Chennai, India	8 (IND)
13.	Workshop for DOF/AP staff in Fish Farming Systems Research and Participatory Rural Appraisal and Collection of Local Knowledge	9	Chennai, India	10 (IND)
14.	National Workshop on Precautionary Approach to Fisheries Management and on the Code of Conduct for Responsible Fisheries	2	Kuala Lumpur, Malaysia	44 (MAL)

<i>No.</i>	<i>Subject</i>	<i>Duration Days</i>	<i>Venue</i>	<i>No of Participants (Country)</i>
15.	National Workshop on Stakeholder Approaches to Fisheries Management and Information Needs for CBM and Strategic Planning for Facilitation of CBM'	2	Kuala Lumpur, Malaysia	21 (MAL)
16.	Integrated Coastal Zone Management in Alor Setar, Kedah; results from various scientific characterisations and ecological baseline and impact studies of selected management initiatives, in particular the establishment of 'Pulau Payar Marine Park' (SAMP) in the coastal areas of Kedah.	3	Alor Setar, Kedah, Malaysia.	30 (MAL)
17.	Regional Workshop on Smart Partnership for Sustainability in the Fishing Industry.	3	Penang, Malaysia	39 (All countries)
18.	Stakeholder Consultation of Divers and Collectors of Ornamental Fish in the Negombo Area regarding the Organisation of Divers and Collectors	1	Negombo, Sri Lanka	95 (SRL)
19.	Stakeholder Consultation of Divers and Collectors of Ornamental Fish in the Colombo Area regarding the Organisation of Divers and Collectors	1	Colombo Sri Lanka	130 (SRL)
20.	Regional Workshop on the Conservation and Sustainable Management of Coral Reefs in South Asia	3	Chennai, India	50 (IND, SRL, MLD)
21.	Discussion with Fisherfolk Stakeholders in Sibolga on Fisheries Management and VPA	1	Sibolga NS, Indonesia	30 (INS)
22.	Training of DOF/Thailand Staff on the Conduct of Study	1	Phuket Thailand	6 (THA)
23.	Discussion on Impact of Globalisation of Fisheries with Senior Law Students of Dr. Ambedkar Law College	1	Chennai TN, India	10 (IND)
24.	Workshop on Changing Technologies and Reaching Rural Women: Women in Fisheries in Asia (Dr. Revathi Balakrishnan)	1	Chennai India	12 (IND)
25.	Workshop on Safety at Sea (Mr. Jeremy Turner, FAO-HQ)	1	Chennai India	15 (IND)
26.	Training in Fisheries Management for DOF Staff from DOF-TN Staff Training College	1	Chennai	15 (IND)
27.	Training of DOF staff on the Conduct of Baseline Socio-Economic Study in Malaysia	2	Alor Setar, Kedah Malaysia	10 (MAL)

<i>No.</i>	<i>Subject</i>	<i>Duration Days</i>	<i>Venue</i>	<i>No of Participants (Country)</i>
28.	National Workshop on Cleaner Fishery Harbours in Sri Lanka	1	Negombo Sri Lanka	55 (SRL)
29.	MOFL/BOBP/DFID Consultation of Senior Decision-Makers on Food and Livelihood Security in Coastal Bangladesh	1	Dhaka Bangladesh	108 (BGD)
30.	Ornamental Fish Sector Stakeholder Meeting to Propose Establishment of Management Advisory Committee	1	Colombo Sri Lanka	28 (SRL)
31.	Seminar on Promotion of Development and Management of Ornamental Fish Sector, as a part of National Trade Fair	1	Colombo Sri Lanka	200 (SRL)
32.	Training of Selected Enumerators from Local Fishing Communities in Kanniyakumari District to Conduct a Survey on Fishing Patterns and Intensity in KK District and a Survey to Specify the Exact Needs and Concerns of Utilities and Infrastructure for Every Fishing Community in KK District	1	Kanniyakumari India	15 (IND)
32.	Training of Selected Enumerators from Local Fishing Communities in Kanniyakumari District to Conduct a Survey on Fishing Patterns and Intensity in KK District and a Survey to Specify the Exact Needs and Concerns of Utilities and Infrastructure for Every Fishing Community in KK District	1	Colachel India	52 (IND)

Appendix I

PROGRESS REPORT 1997 - 98 : POST-HARVEST FISHERIES PROJECT (DFID-PHFP)

BACKGROUND

The Post-Harvest Fisheries Project is funded by the Department for International Development (DFID²) of the United Kingdom and managed through the Natural Resources Institute (NRI). Phase I of the Project was initiated in August 1987 and concentrated on identification of post-harvest problems in the Bay of Bengal region. Phase II (1989-1992) focused on the development of technical interventions to address post-harvest problems. Phase III commenced in April 1993 and has been working towards the adaptation of technical solutions to the realities of coastal fisherfolk communities. The first and second phases focused their efforts on India while phase III included activities in Bangladesh and Sri Lanka. The current phase was scheduled for implementation over a five year period and is due to finish on 31 March 1998. However, the end of the third phase also marks the termination of the project which has worked with small-scale artisanal fisherfolk in the post-harvest subsector for the last ten years. As this third and final phase comes to an end, this report will briefly reflect on the past ten years and present a synopsis of the activities. A status on post-harvest fisheries in South Asia is given in Appendix 1.

Three Bay of Bengal Programme (BOBP) member countries are included in this project: Bangladesh, India and Sri Lanka. The principal objectives of the project as defined by the project memorandum are:

- * to enhance the incomes of artisanal fishing communities and petty fish traders in India, Bangladesh and Sri Lanka;
- * to identify and develop the potential for increasing the diversity of fish products marketed by these communities;
- * to strengthen the ability of non-government organisations (NGO) and fisherfolk associations to replicate and secure sustainable benefits from project activities.

The project operates from a main office in Chennai with field offices in Andhra Pradesh and Bangladesh. Implementation of project activities is carried out by local staff in all three countries often working with government departments and non-governmental organisations (NGO). Although regional in character the individual country components are covered by separate inter-governmental bilateral aid agreements. Within these country frameworks, the project is divided into a number of main activities and these are briefly dealt with later in the report.

INTRODUCTION

The project has always focused on working with small-scale fishing communities in the marine artisanal fisheries sector. These communities traditionally suffer from natural disasters, environmental degradation, over-fishing and population pressures. Climatic changes will also lead to an increasing instability in the coastal areas. Previous fishery capture and production orientated practices have been instrumental in placing more strain on the common pool of

^{**} *The Department for International Development was formed in May 1997 and was previously known as the Overseas Development Administration.*

resources. Therefore, it is essential that these resources are sustainably managed and the usage of such resources is maximised. This project has worked towards this aim by improving the efficiency of post-harvest handling, processing and marketing of sustainably produced products. However, the project has always taken a much broader approach in working with coastal communities by addressing issues that affect the lives of coastal fisherfolk communities and workers in the post-harvest subsector and, ultimately has always worked towards sustainable livelihood strategies.

The project has always followed a process approach by developing, demonstrating and promoting new techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities. From the beginning the project has operated within the administrative umbrella mechanism of the Bay of Bengal Programme from offices in Madras, although it has remained very much an independently funded and managed project. The project has limited its field work to the areas where post-harvest issues were considered particular priorities by the member states at that time i.e. in India, Bangladesh and Sri Lanka. In India only the east coast states (Tamil Nadu, Orissa, Andhra Pradesh and West Bengal) were involved. This smaller focus has allowed for more effective use of the project's limited budget but has also provided other countries in the wider region with relevant information about post-harvest issues through the project's newsletter and other promotional activities.

The project has operated over a large geographical area in trying to address a wide diversity of development problems. An important element of the project has been the strong partnerships formed between the project, other donor projects, government departments and non-government organisations in the three countries. Non-government and government staff have played a vital role in identifying key problem areas to be addressed and in facilitating the evolution of solutions.

The partnerships with NGOs has been crucial to the project's success and they have provided a vital mechanism for close interaction with the communities, especially those NGOs which have their origins in the fishing communities themselves. The project has placed considerable emphasis in recent years on forging strong partnerships between NGOs and government, and this is seen as an important function for the success and sustainability of work with coastal communities in the future.

The approach adopted by the project has been flexible, reactive and catalytic. Flexible in the sense that it was very openly defined at the design stage allowing the project to adopt a process approach to activity planning. The project had the scope to identify, design and appraise a series of sub-projects within a broad project framework. Reactive in that its function was to respond to the needs of the coastal communities, or to the needs expressed by other agencies as and when post-harvest problems became apparent. Catalytic in that the project aimed to find solutions to problems, develop methodologies for resolving them, and then to mobilise local institutions to carry out the implementation and dissemination of ideas. The project then took the essential lessons and methodologies from the localised situation and made them regionally available. In that way the benefits from project activities could reach a wider audience across the region.

As mentioned earlier the project has had three phases. Phase one was from 1987 to 1989, phase two from 1989 to 1992, and phase three from 1993 to 1998. The emphasis of the project in the first two years was on identifying losses in the quality and quantity of fish landed and finding solutions to these losses. It was essentially a production-oriented approach which tried to identify losses primarily from a national-level perspective. It thus tried to define the type and extent of the problem regionally and then start to explore possible technical solutions.

The aims of the second phase became more focused on the needs of the fisherfolk which it saw as primary stakeholders along with the consumer. A wide range of activities were carried out during the second phase of the project and others were new areas of work such as flying fish marketing, insect infestation control and tuna processing. The geographical focus at this stage of the project was predominantly India, with a few activities being initiated in Bangladesh and Sri Lanka towards the end of phase two. The project identified post-harvest problems at both the macro and community levels and then identified technical solutions to overcome them. They worked with NGOs and government departments to encourage and support the transfer of these technologies.

The third phase changed considerably from the previous two phases with the dropping of some activities which were considered unsustainable, the radical restructuring of others and the involvement of new areas of work. Fish marketing, anchovy drying and the use of ice have continued from previous phases but have expanded into new locations along the Indian coast. Fish smoking in Andhra Pradesh has proved an important new area of operation. The geographical focus of the work has expanded to include new projects in both Sri Lanka and Bangladesh. In Sri Lanka, work with cycle traders using ice has expanded from its base in St John's Market, Colombo to wider use of ice boxes along the coast. There have also been very close links with the Ministry of Fisheries and Aquatic Resources in working with fisheries cooperatives in the post-harvest subsector. In Bangladesh the focus of the project has been with poor coastal communities in areas where inshore resources are threatened from over-exploitation. The project aims to increase the post-harvest income from landed catch and to assist fisherfolk to diversify into income-generating activities outside of the sector.

There has also been a far greater emphasis placed on building the institutional capacity of local partner development agencies in the NGO and public sectors, and in designing methodologies to address the needs and capacities of these agencies as well as those of the fisherfolk.

Interaction with Departments of Fisheries (DOF) has started to increase awareness of post-harvest issues at the policy level, and Governments are showing increased support for post-harvest issues. Several of the State Governments in India have taken the step of including post-harvest inputs in their next five-year plans. Three state-level workshops involving fisherfolk representatives, NGOs and government officials will be held in Tamil Nadu, Andhra Pradesh and Orissa. A key presentation at these workshops will be the DOF's future strategy on post-harvest fisheries.

The recent discussions with the Minister of Fisheries and Livestock in Bangladesh resulted in the first ever consultative meeting with senior policy-makers to consider issues affecting coastal fisherfolk's food and livelihood security. This was an important beginning in raising these issues at a national level and discussing the policy implications and effects of addressing these problems. In Sri Lanka the Minister of Fisheries and Aquatic Resources has openly supported the project's inputs and the government has shown greater enthusiasm and commitment towards the post-harvest subsector.

The project has gone through an evolutionary process over the last 10 years. Initially it was predominantly production-focused, trying to identify micro-level technical solutions for problems with national-level significance and regional-level transferability. In the second phase the emphasis was on attempting to promote such technical solutions at the community level. Fisherfolk were encouraged to adopt technical innovations from the project that were designed to benefit their lives. The purpose of the project assumed a high priority for post-harvest issues in the lives of the fisherfolk which was not always seen in practice. The successes and failures of the second phase led to a change of emphasis in the third phase towards a closer partnership with fisherfolk involved in post-harvest activities. This partnership jointly identified problems important to the fisherfolk, and developed solutions to those problems which had direct relevance to the needs, experience and capacities of the fisherfolk. Greater emphasis was placed on assessing the appropriateness of project interventions to the needs and priorities of the fisherfolk and less on the efficiency of technical interventions. While retaining the environmental concern, there was a shift in perspective from mainly technical and economic sustainability, towards greater concern for social and cultural sustainability.

The project has progressively shifted from a technology-centred to a people-centred approach. It has moved from addressing post-harvest issues of national importance, to focusing on improving the living standards of post-harvest workers in artisanal fisheries by whatever means available. This has meant that, while post-harvest interventions are still the main focus of the project, other issues have also had to be addressed in parallel if a positive impact is to be achieved. This reinforces the realisation that fisherfolk are involved in a wide range of inter-linked and inter-dependent activities, only some of which are directly related to the post-harvest subsector. This shift in emphasis has led to greater ownership by the fisherfolk of the processes of change and has contributed to the substantial increase in the uptake of improved post-harvest processes in the third phase.

During early 1997 DFID commissioned a study on the impact assessment of the project which provided a very detailed and comprehensive insight into the level of impact at various locations which were studied by the team; This concluded that the project has made significant improvements in its impact on the fishing communities of the three countries since it began. This was partly because of the change of emphasis in the third phase of the project but it was also because of the momentum of the project that had been built up over this long timeframe. This has allowed a strong interaction with the project's key partners and with fishing communities, which has contributed to a much greater understanding of the relatively wide range of issues that concern the fishing communities. The falling catches from inshore resources in India has played a significant role in raising the profile and relevance of improved post-harvest activities. In Bangladesh inshore resource shortages have increased demand for income generating opportunities for all fisherfolk outside of the sector. In Sri Lanka the improved well being of the fish traders as a result of better use of ice and increased access to a range of other services through better organisation, have prompted an expansion in demand interventions along the coast.

Although the overall impact of the project has so far been small, it has created the conditions for very large impact in the future if the lessons learnt at the micro-level can be replicated on a large enough scale in a sustainable manner. This will be a crucial aspect if positive benefits are to be secured by coastal communities and is a key challenge facing the government and NGO sector in the region.

Even though this project will close, the scope for continuing work with coastal communities through DFJD-funded support is very promising. In Bangladesh a mission last year suggested that DFID should consider expanding its support to coastal fishing communities. It was recognised that in Bangladesh DFID is strategically placed to provide this assistance, given its long experience in working with fishing communities in the inland fisheries sector. In India a mission is planned for April 1998 which will assess the scope for working with coastal communities through an integrated approach focusing on livelihood strategies.

SUMMARY OF PROJECT ACTIVITIES

Regional Information Dissemination

The project supports a wider process of development by interacting with other institutions and organisations within the post-harvest sector and by disseminating information on post-harvest activities and issues at both the micro- and macro-level. Providing channels for information flow about the agencies working in the post-harvest subsector is significant in that it has been possible to develop stronger linkages between producer groups, bargain for better prices in the markets, and exchange methodologies for successful replication of activities. More importantly, the strengths and weaknesses of the agencies working in the sector could be discussed, and multi-agency action plans could be implemented. Specific activities in this programme included:

- * Publishing and distribution of a quarterly newsletter, the Post-Harvest *Fisheries News*, which was widely circulated among the various agencies working on post-harvest issues both within the region and abroad;
- * Publication and distribution of ten *advisory leaflets* covering a range of topics: credit availability, use of ice and ice boxes and drying racks. These are all available in English and several of the leaflets have also been translated into local languages – Tamil, Telugu, Oriya and Malayalam (India), Bengali (India, Bangladesh) and Sinhalese (Sri Lanka). They have proved to be a very cost-effective way of disseminating and providing information for fishing communities and development agencies working with these communities.
- * Commissioning studies on *availability of credit for fisherfolk*, and the *market Channels for processed fish* in Andhra Pradesh and Orissa, and publishing them as reports;
- * Preparing *Post-harvest overview studies*, to provide an initial baseline of information concerning activities, institutions and constraints facing post-harvest fishery aspects for providing a concise and detailed document

that will be helpful to policy-makers, governmental and non-governmental organizations, private sector and international agencies to inform them of problems and prospects within the post-harvest fisheries sector;

- * Publishing a book of *guidelines to development agencies venturing into marketing*, the benefit of various NGOs which plan marketing interventions in post-harvest sub-sector;
- Publications on *methodologies* developed by the project for conducting socio-economic studies of fisherfolk communities based, on work conducted with set bagnet communities in Bangladesh, and on *planning, implementation, monitoring and impact assessment* the various project activities;
- * Publication of a report on *sustainable income enhancement programme for small-scale fishing communities* which was the result of a two-year capacity - building effort aimed at strengthening the ability of NGOs working with coastal fishing communities by developing income-generating activities for the communities in Bangladesh, and a publication on an *assessment of sources and types of rural credit available for fisherfolk communities in Bangladesh*.
- * Publication of the *results of a 13-month socio-economic research study* on three set bagnet fishing communities in Bangladesh, which has been translated into Bangla so as to reach a much wider audience,
- * Participation in seminars, symposia, workshops and other platforms for dissemination of information on the post-harvest sub-sector and the activities of the project in the sub-sector.

Impact Assessment Study

A pre-view assessment of the project was carried out in May 1996 which indicated that the project had begun to move towards achieving its purpose, but that it still had some distance to go before any significant impact was made.

A DFID mid-term review in July 1996 agreed that there was a need for an impact assessment study (IAS) which would aim at providing a basis for making informed decisions with regard to the future of the project. Local consultants were recruited to carry out the study in India, Bangladesh and Sri Lanka. It was completed in April 1997.

The methodology used for the study was evolved after a series of regional workshops with partner organisations, and the techniques were field-tested at fishing villages near Chennai. The teams consisted of independent external consultants, key project staff and facilitators from partner organisations. Focus group discussions, individual interviews, discussions with key informants and direct observations were some of the key methods used in obtaining the information.

The main findings of the study were presented and discussed at a workshop held in Chennai during the second week of May 1997. The team felt that the project has made significant improvements in its impact on the fishing communities of the three countries since it began. The overall impact of the project has so far been small, but it has created the conditions for very large impact in the future if the lessons learnt at the micro-level can be replicated on a large enough scale in a sustainable manner.

As a result of feedback and discussions at the workshop, the results of the IAS have been presented in two parts.

The first part provides an outline of the main impacts of the project, the methodology and approaches that were used in the study, the lessons learnt and the future options and issues for the project. The second part provides fairly detailed field notes on all the locations visited. This information was considered to be useful in providing insights into the nature of the interventions undertaken and the kind of impact achieved by the project in each of the locations studied. The two reports have been circulated within DFID to enable the key officials responsible for the country programmes to make an informed decision on the future of the project. The reports are also being widely circulated to partner organisations in India, Bangladesh and Sri Lanka.

Intervention Model

The project and key partner organisations have been developing an “intervention model” that will document the project’s approach to post-harvest fisheries development based on the experiences of working in this subsector in the region. It will take the form of a series of guidelines emphasising the need to use a broad-based approach in assessing the suitability of interventions, which takes into account the interrelated and interlinked issues in developing and working with fishing communities. The guidelines will draw heavily upon the project’s experiences, using appropriate case studies, and will be targeted at government, non-government and community-based organisations. A final workshop is scheduled for October when the draft document will be prepared.

Training programmes

The project supports *building up the capacity of NGOs and Government officials* to work more effectively at the community level in order that interventions *can* be effectively implemented. This approach is designed to develop the fishing communities socially and economically and address the problems and needs of these vulnerable groups, particularly in gaining access to credit, transportation to market and improved fish handling and processing. The emphasis of the training programmes is thus to address the specific needs of NGOs and official development agencies in the region in order to strengthen their ability and to plan and take up initiatives in post-harvest fisheries. The training programme is also specifically targeted at groups from fishing communities. It is aimed at raising skills and increasing the awareness of post-harvest issues such as improved handling, processing and hygiene, and to identify strategies for improving incomes, through alternative income generating schemes, and improving living conditions in fishing communities. The project has organised several training programmes for government officers from the Department of Fisheries (DOF) and other government agencies, as well as for participants from the NGO sector. Staff from the Asian Development Bank Fisheries Sector Development Programme recently visited project activities in India and Bangladesh. Also, two staff members from a DFID supported NGO in Bangladesh visited project sites in India to view the project’s post-harvest activities and discuss the lessons that the project has learnt in working in this subsector.

Training at the community level has focused on increasing communication and leadership skills as well as basic fish handling and processing techniques. The ‘train the trainers’ programme has worked with the core staff of two NGOs in developing units which will eventually carry out the training at the field level. This is seen as an essential step in working with the communities towards achieving sustainability through the promotion of the social and economic development of the fishing communities and acquiring the technical capacity to teach basic fish handling and processing.

INDIA

The Indian component of the post-harvest fisheries project is the largest of the three country programmes. The focus continues to be on addressing post-harvest issues and supporting appropriate interventions to provide an opportunity to use existing fishery resources more effectively and provide increased incomes for coastal communities.

Post-harvest interventions

With more quantities of fish being exported to distant markets, and fetching very good prices in fresh condition in local markets as well, the need to preserve the fresh fish in prime condition has become paramount. Two important requisites for achieving this were: availability of ice and accessibility to ready transport systems.

In recent years the rising demand for fish relative to supply has increased the value of fresh fish. Changes in attitude to quality have been increasingly recognised by the fisherfolk communities who are more willing to invest in ice boxes and

ice. The project has emphasised the growing need for using *improved ice boxes for onboard and onshore usage*, and improved insulated boxes of various sizes were developed and promoted among the fisherfolk. This is one of the most important and successful programmes of the project, as seen from the fact that most of these boxes are being purchased without any incentives from the government or any other source. Currently, more than 2,000 boxes are being used aboard a variety of fishing crafts. The ice boxes being used onshore were primarily aimed at small groups of petty fish traders, particularly women, who were seen to benefit from access to an insulated container for storing their fish overnight and reducing the need for 'distress sales'

Most of the women petty fish traders do not have the capacity to invest in any private mode of transport, unlike the large traders who have their own transport systems to carry fish out of the villages. State-run public transport systems and private buses often do not travel to their villages, and the timings and frequency of buses do not cater to the needs of these women. Therefore, to address this problem the project has provided an alternative transport system in the form of a *motorised tricycle* in a couple of locations in Tamil Nadu. These were managed and maintained by the women's groups, with assistance from the local NGOs. Ready access to transport systems in the village has been seen by the women to be a very effective way of obtaining good prices for their produce. The Tamil Nadu Government is now proposing to distribute 25 tricycles to fisherwomen co-operatives supported by the DOF. The project has also produced a briefing note for the DOF on their experiences with this activity.

Other activities of the project have focused on upgrading the traditional drying and marketing of dried anchovy and other fish through *improved and more hygienic processing methods* such as *drying racks*, to optimise incomes. The project has played an important role in explaining and demonstrating the benefits of using racks to government and non-government agencies and this has led to an increased awareness on using racks to improve the quality of dried. The expanded use of drying racks in various locations in India and the increasing acceptance of consumers prepared to pay for a more hygienically prepared product is growing evidence that this will continue after the project's withdrawal.

The project has also worked very closely with itinerant women fish traders in order to address their needs for credit, *better transport and access to markets*; the introduction of an *improved smoking kiln* in the Godavari delta in Andhra Pradesh; and providing *marketing support* to development agencies and fisherfolk organisations venturing into marketing. The latter is particularly important because the success of any new technology or process is dependent on its being accepted in the market place. It is not sufficient to simply produce a better quality product without first determining whether the improved quality product will fetch a better price, commensurate with the additional effort, time and money spent on producing it. The project has also worked very closely with the DFID's Post-Harvest Fisheries Research Programme (DFID-PHFRP). The marketing development activities have been very closely linked to this programme's inputs under DFID's Renewable Natural Resources Research Strategy. This was initiated in 1996 through a series of studies on the composition, structure and dynamics of fish marketing in India, and end-user preference for the type of traditional and "value-added" products that could be produced and accessed by traditional fishing communities. The results of these strategic studies were completed during 1997 and have been transferred and promoted through the publication of a report based on a workshop in Chennai in 1997 that discussed the conclusions of the studies.

The project continues to work very closely with its *partner agencies in the government and NGOs sector*, the focus being on strengthening their capacity to undertake activities in the post-harvest fisheries sector on their own and ensuring that this is transferred to the community. These activities are slowly empowering and enhancing the management capacity of the community organisations as they have to liaise and form links with agencies located outside the village. In the case of the tricycle it has increased the visibility of the women petty fish traders within the fishing village community,

The project has assisted various government agencies such as the District Rural Development Agency, Backward Classes Development Corporation, National Bank for Agriculture and Rural Development, and the Department of Fisheries in the implementation of government schemes to supply improved tools such as insulated boxes, fish drying racks, fish containers and smoking kilns to fishermen by facilitating inputs from various agencies. During the implementation of

the government schemes, the project played a monitoring role, trying to ensure that the schemes ran according to action plans.

The project periodically conducted workshops for disseminating the findings of the various studies, for discussing future options in areas like credit to fisherfolk and marketing requirements of development agencies. Awareness programmes were conducted to raise awareness among consumers about the improved quality fish and fishery products. The project assisted agencies involved in production and marketing of value-added products to exhibit their products. Training programmes and exposure visits were conducted for the government and NGO staff and fisherfolk, to demonstrate the viability of post-harvest interventions.

In every activity, the project tried to look at the long-term implications – social, economic, technical, environmental, institutional and gender-related – and assess their impact on the fisherfolk. In order to achieve this, the project employed staff from diverse disciplines who could speak the local languages, and where required, local consultants were engaged. All activities were conducted through intermediate agencies – governments or NGOs – and the project provided them with technical advisory support.

Several coastal fishing villages were affected by the cyclone that hit East Godavari District in Andhra Pradesh. As a result of discussions with the DOF, DFID's Emergency Aid Department agreed to support assistance to these communities under the *rehabilitation of cyclone affected coastal communities*. The project would provide capital goods on a loan basis (rather than the usual straightforward grant), would also target women fish processors. There would be strong participation in the project from government, NGOs and the fishing communities. This approach combines the skills and experience of the DOF with that of several NGOs with support from the project office in Andhra Pradesh.

BANGLADESH

The Bangladesh component is the second largest of the three country programmes. It focuses on working with the artisanal communities of Bangladesh who are amongst the poorest rural communities in Bangladesh, and are very prone to natural disasters. Increasing fishing pressure is threatening supplies to the post-harvest sector. Project activities have continued to support NGOs working with coastal fishing communities in understanding the specific problems of set bagnet fishing communities. At the policy and government level the project has worked very closely with the FAO-BOBP which is working with the Government of Bangladesh at the macro-policy level towards formulating policies and strategies regarding the management of set bagnet fisheries. Project staff have co-operated in sharing ideas and exchanging information, and local staff have continued to participate in a number of workshops with officers from the Department of Marine Fisheries. This has led to an exchange of ideas and experiences as a result of the free flow of information between the two projects.

The project had several meetings with the State Minister of Fisheries and Livestock* (MoFL) and other senior officials on the issues affecting coastal fishing communities in Bangladesh. There is a growing recognition that this is a national issue which can only be addressed using an integrated coastal management approach in a concerted manner through the co-operation of various government agencies, NGOs and donors working with coastal communities. As a result of these meetings, a *senior decision makers consultation on food and livelihood security* was held in Dhaka in late 1997 which was jointly funded by FAO-BOBP and this project. This meeting provided a very important forum to raise awareness of these issues and discuss constraints and problems in addressing livelihood and food security issues concerning coastal communities.

² Visitors to the project during 1997 are listed in Appendix 2

The project has continued to support the *Coastal Fisherfolk Community Network* which acts as a forum to address the concerns of coastal fisherfolk communities at the policy and institutional level and to raise awareness on the issues affecting the livelihoods of these communities. The project provided the services of a planning consultant' to assist the network in establishing clear strategies and outputs to achieve this purpose. As a result of this workshop the network was able to develop a proposal for submission to DFID.

The project has continued to provide *institutional support for set bagnet fishing communities*. This fishery is a major contributor to the livelihood of the coastal communities which are amongst the poorest sections of the population and it also provides a sizable proportion of the marine and brackishwater capture fishery production. Concern has also grown over the possible effects of Government legislation to outlaw set bagnets which are seen as destructive and therefore pose a threat to the sustainability of the fishery resource, upon which many coastal fisherfolk depend for a livelihood.

The May 1997 cyclone devastated many of the villages where the project works along the eastern coastal area of Bangladesh and in the Bay of Bengal highlighting the susceptibility of these communities to natural disasters. The three communities covered by the project suffered extensive damage to their houses, fishing boats and gear, and loss of assets. It was agreed that the project should provide some assistance based on the extent of the damage suffered by the members through the provision of loans. The incorporation of appropriate strategies and mechanisms into community models is essential so that community groups will be prepared to deal with natural disasters and their aftermath.

SRI LANKA

This is the smallest of the three country programmes. The focus has been on continuing to work with itinerant petty fish traders who operate from the main fish markets in Colombo and Negombo, and supporting the development of fishermen cooperatives in the post-harvest subsector.

The project has been working towards an exit strategy by focusing on enhancing the leadership abilities and the capacity of the cycle traders at St John's Market, Colombo and Negombo so that they are in a position to manage the affairs of the society and ensure sustainability when the project withdraws. Essentially, this year has been one of consolidation in increasing savings by the existing membership, training the Board of Directors and ordinary members, strengthening communication within the societies and building linkages with local institutions. The project has forged links between the cycle traders and officials from the Ministry of Fisheries and Aquatic Resources (MFAR) and this interaction will enable the society to access training, support and guidance from the Ministry in the future. Links have also been established with several banks who are prepared to extend a line of credit against the savings of the cycle trader associations and the Asian Development Bank's Fisheries Sector Development Programme.

The project has established very strong links between the MFAR and the Department of Cooperatives in *supporting the development of fishermen's cooperatives in working in the post-harvest subsector* and continued to work closely with MFAR and the Asian Development Bank's (ADB) - funded Fisheries Sector Development Programme through which the project is linking its efforts into the wider fisheries development field.

The project successfully completed the design, development and testing of appropriate ice boxes for itinerant cycle traders and onboard 22 ft craft. These boxes were designed on the basis of discussions held with individuals belonging to these two groups. The boxes have enabled cycle and motorcycle traders to access distant markets as they can store fish longer. They have helped craft owners to reduce distress sales of fish, particularly if they land fish in the afternoon after the market has closed.

³ Consultants to the project during 1997 are listed in Appendix 3.

The Minister of Fisheries and Aquatic Resources has evinced keen interest and given his full support to this activity. Links have been established between fishermen's cooperatives in the coastal area with multi-purpose cooperatives in the hinterland in a first effort to establish a simple "cool chain" for wet fish. The Cooperative Bank, and other banks, have agreed to provide loans to the traders who are cooperative members so that they can purchase the boxes in addition to having working capital for fish and ice. Links were established between two fishermen's co-operatives in Chilaw and Negombo to provide fish to a multi-purpose cooperative based in Kandy which was closely monitored by the project and officials from the Ministry. The initial results were very promising and the Ministry proposes to extend this activity to cover other interior areas of the country. The strong commitment and support to this activity through the Ministry and Department of Cooperatives is a very good indication that the government is prepared to undertake this activity after the project's withdrawal.

Lessons Learnt

During the course of 10 years from 1987 to 1997, the project has gradually evolved methodologies for addressing the needs of post-harvest fish workers in the coastal zone of the region. It has also begun to develop the institutional mechanisms to take this methodology to a much wider audience. Following are the important lessons learnt by the project:

- ∇ **"Bottom-Up" Approach:** A flexible, needs-based, community-oriented, process approach has a greater opportunity for success than an elaborately planned project rigidly implemented. Solutions to post-harvest problems should be evolved jointly by the development agents and the community. They should be sustainable and within the needs, aspirations and capacity of the fisherfolk.
- ∇ **Integrated approach to development:** A technological intervention alone is a poor approach to developing communities: it needs to be taken up in a more holistic way, integrating social, economic and environmental issues into the design. Post-harvest problems are often symptomatic of wider social and economic problems and these often have to be addressed before the post-harvest interventions can be introduced.
- ∇ **Time frames required for maturity of an intervention:** Working with low-income individuals and groups within complex social, economic and cultural structures, is a gradual process which must be carried out over a long time span if sustainable impact is to be achieved. There is often a critical mass of development effort required within a particular community in order to stimulate uptake of new approaches on a level which leads to sustainability.
- ∇ **Synergy and institutional capacity:** The problem to be addressed should reflect the priorities of the fisherfolk and not just those of the development agents, but the needs, aims and capacities of the partner development agencies are important factors in the design of intervention methodologies. Post-harvest intervention is best carried out as a balanced partnership between the fisherfolk, local support agencies (NGO and Government) and the project, rather than in a prescriptive and top-down manner.
- ∇ **Good management practices:** Changing minor aspects of post-harvest processes can often have a profound effect. This may entail lower risk and produce higher impact than introducing a completely new technology, which may be expensive and fraught with uncertainties.
- ∇ **Negative implications of post-harvest interventions and alternative income-generating activities:** Not all post-harvest interventions are benign. In some cases, post-harvest intervention may lead to improved incomes being re-invested in productive capacity in over-exploited resources. In such cases, the most appropriate intervention for post-harvest operators is alternative income-generating opportunities outside of the sector.

- ✓ **Documentation and dissemination:** The cost of defining problems, evolving solutions, developing support and changing methodologies can be high. The benefits are maximised when the interventions are recorded in ways which have relevance to a wide audience and are effectively disseminated.
- ✓ **Participatory planning and monitoring:** The impact of development efforts should be measured in a participatory way. All the key stakeholders should contribute to defining the indicators of success, deciding the means by which their achievement should be verified, and implementing the monitoring.
- ✓ **Policy:** While solutions to post-harvest problems may start at the community-level, the ultimate success of these solutions requires changes in the way NGOs and government departments support the uptake and transfer of these solutions through assistance and policies.

Future issues and options

Fisherfolk enthusiasm over project interventions continues to grow. Demand for project-supported interventions has been seen to be increasing in all areas. The post-harvest focus of the project has had the benefit of reducing the need to increase pressure on threatened fish resources and on increasing the value and quality of produce reaching the market. The regional focus of the project and the sharing of experiences between projects, NGOs and governments has promoted increased international and national cooperation. The institutional linkages formed have contributed to a more efficient and effective use of the project's limited financial resources.

The project focus of working through both NGOs and government should increase the sustainability of the outputs after the project is completed. This will only occur, however, if the staff of these agencies fully understand the complexities of changing post-harvest practices, and if they are given the resources to implement these changes. The "Intervention model" that the project is now developing will address these very points by focusing on a strategy to optimise livelihood benefits of coastal fishing communities. However, many donor agencies are now withdrawing from Southern India and this may have repercussions within the NGO sector as funding levels decline.

Although the Governments of India and Sri Lanka are both moving towards recognition of the importance of post-harvest fisheries the policies are not yet in place to ensure the sustainability of this focus nor to direct resources towards changing practices. However, any enthusiasm by government and non-government agencies to adopt post-harvest policies and practices must be equally matched by appropriate development of knowledge and skills in this area, so that projects implemented take proper account of their social and economic context.

However, it must be borne in mind, that while the improved post-harvest practices are theoretically replicable in other areas, their uptake will depend on those practices being adapted to the problems, needs, aspirations and capacities of the groups concerned in those areas. This will require the extension agents in government and NGOs to gain the skills to assess these factors and to develop the practices to suit local circumstances. The extent to which the methods of working with NGOs **and** government departments are replicable needs to be explored. All of these institutions have a commitment to providing support to a very large number of coastal fisherfolk but, in the main, lack the capacity to do so. They will require continuous guidance and support for some time to come before this is sustainable. The work in Bangladesh with the range of support services being provided to NGOs working with different set bagnet communities has moved towards the development of a methodological approach which is still in its early stages but from which much can be learnt.

FUTURE UPTAKE OF PROJECT OUTPUTS

The project has now progressed a considerable way to developing appropriate intervention methodologies to address many post-harvest problems. In the villages where the project has worked these interventions have been well received

and, in the main, have been adopted. These interventions, however, have not yet been widely institutionalised in NGOs and governments, nor have the communities arrived at the point where they are fully able to understand post-harvest issues and adapt to them. The project is currently developing an “Intervention Model” in the form of a manual which will encapsulate the project’s learnings for dissemination to organisations involved in the post-harvest fisheries sector.

Although many fisherfolk see post-harvest issues as of major importance, they are often not considered to be their highest priority. Other issues are seen as vital. Fisherfolk need to address and overcome these problems before they are able to take up opportunities in post-harvest practices and these usually relate to their immediate social and economic problems such as debt, limited cash-flow, social obligations, and high risks associated with existing operations. In relation to these problems, the project has often had to focus on group formation and improved access to credit prior to the uptake of improved post-harvest techniques - a slow process. The shift in focus of fisherfolk from a very short-term consumption-oriented work strategy to one of longer term investment, as required by many post-harvest interventions, has also not been easy to achieve. In addition there has, in the past, been some apathy on the part of government and NGOs to post-harvest changes, due in part to production-oriented policies and in part to a lack of understanding of post-harvest activities. There have also been resource-related difficulties (the collapse of the seerfish fishery off Andhra Pradesh and the anchovy fishery in Tamil Nadu) and political problems (in Bangladesh and Sri Lanka) which have delayed implementation. In spite of these difficulties much useful work has been done to achieve the project outputs as stated.

ABBREVIATIONS

ADB	Asian Development Bank
BOBP	Bay of Bengal Programme
DFID	Department For International Development
DFID-PHFP	Department For International Development's Post-Harvest Fisheries Project
DOF	Department of Fisheries
IGA	Income-Generating Activity
NGO	NonGovernment Organisation
NRI	Natural Resources Institute
PHFRP	Post-Harvest Fisheries Research Programme

Appendix 1 : Post-Harvest Fisheries Project

Summary of Progress Against Outputs

Project Title: DFID Bay of Bengal Post Harvest Fisheries Project

Purpose: Incomes of Artisanal Fishing Communities (AFC) and Petty Fish Traders (PFT) households at selected Bay of Bengal locations sustainably increased.

output	Indicator	Summary of Progress	Remarks
<p>Appropriate technologies identified and transferred to beneficiaries</p> <p>NOTE</p> <p>IND-India BGD-Bangladesh SRL-Sri Lanka</p>	<p>Beneficiary households (hh) adopt through the project improved post-harvest technologies by 31 March 1998 (8000 hh IND, 750 hh SRL & 15 hh BD)</p> <p>Target hh in project locations independently access improved post-harvest technologies by 31 March 1998 (1,000 IND, 10 BGD and 200 SRL)</p>	<p>In IND, DOFs in the three states of Orissa, Andhra Pradesh and Tamil Nadu have started programmes for the promotion of ice boxes. Over 3,000 such boxes have been distributed. Similarly, drying racks are to be promoted in the three states by DOFs. An estimated 2,000 racks have been established.</p> <p>In SRL, ice boxes for cycle traders and for use on board 18 - 22 foot craft are to be distributed by the Ministry of Fisheries & Aquatic Resources. Over 1,000 such boxes are to be distributed during the next financial year 1998-99.</p> <p>In IND, partner institutions - mainly district development agencies, large voluntary and small community organisations - have undertaken post-harvest interventions on their own. An estimated 1,200 hh have benefited from these initiatives.</p> <p>In SRL, the co-operatives have undertaken the task of extending the use of ice boxes by cycle traders who operate in the provinces. Over 250 such boxes have been distributed. It is expected that a further 500 boxes will be distributed when the activity is extended to other districts.</p>	<p>Linkages established by the project between communities, financial institutions and (to a limited extent) markets, has facilitated uptake of technologies. This is especially true of the areas where the project has been operational. At a few locations the communities have already established links independent of the project. This does indicate sustained uptake of technologies even after project closure.</p>

output	Indicator	Summary of Progress	Remarks
<p>Capacity of institutions (local, NGO and GO) to support post-harvest fisheries (PHF) strengthened.</p>	<p>GOs and NGOs integrate PHF technologies into their action plans by 31 March 1998. (IND 10, BGD 3 & SRL 4.)</p> <p>Skill and knowledge base of staff of GOs and NGOs and members of CBOs enhanced to tackle PHF issues by March 31 1998 (IND 600, BGD 70 & SRL 500)</p>	<p>In IND, the DOFs in Orissa, Andhra Pradesh and Tamil Nadu have included post-harvest interventions in their respective five year plans. Extending the use of ice boxes and drying racks are two technologies that are sought to be extended.</p> <p>In SRL, MFAR, the Department of Co-operatives, as well as commercial banks have included the extension of ice boxes in their agenda. Funds have been made available for the purpose.</p> <p>In BGD, the Government has in partnership with the project undertaken a review of the situation of the coastal fisherfolk. It is expected that marine fisherfolk will be included in the development agenda of DOF, and BGD in the coming years.</p> <p>In IND and SRL, most partner agencies have started training programmes on post harvest aspects for artisanal fishing communities. The results of these training exercises have been increased awareness and uptake of improved post-harvest practices.</p> <p>In BGD, the project has tried to extend the methodology adopted in its work with SBN communities to other NGOs which wish to work in the marine fisheries sector and the NGO network (COFCON) is to be used as an institutional base for the purpose.</p>	<p>In IND and SRL, where the departments of fisheries at the state/district levels have been showing greater interest in PHF issues, specific heads have been created for the allocation of funds for the extension of improved post-harvest practices.</p> <p>Demand for ice boxes has been increasing in the past few months. Increases in fish prices in both IND and SRL has meant that more and more private agencies have been taking up its manufacture. This is likely to result in better adoption in the future.</p> <p>With greater emphasis being placed on quality of landed product and tighter monitoring, especially by the EU, enthusiasm has gone up for training courses aimed at improving fish handling and processing. This is especially true of SRL where the Bureau of Standards has begun to certify processing units for the ISO 9000. Training programmes for producers on onboard handling is one of the components</p>

output	Indicator	Summary of Progress	Remarks
<p>Access of AFC and PFT households to markets enhanced.</p>	<p>At least 10% increase in average annual sales turnover (fish, fish products and other products in BGD) of target hh by 31 March 1998.</p> <p>Improved products account for following shares of increased net incomes of adopter target hh by 31 March 1998 (IND 15%, BGD 5% & SRL 25%).</p>	<p>In IND, the sales turnover of a large proportion of the individuals who participated in the project's intervention increased by 30%. In most cases it has been through gaining access to cheaper sources of credit.</p> <p>In SRL, turnover of cycle traders has increased by 50% in areas where the project has intervened.</p> <p>In BGD, women in SBN communities have been able to increase their sales turnover by more than 10% by accessing better markets.</p> <p>In IND, over 30% of the smoked fish sold in the east Godavari district, Andhra Pradesh is processed using an improved smoking kiln.</p> <p>In SRL, fish iced in boxes developed by the project form over 30% of the fish sold by cycle traders.</p>	<p>Linkages to markets have been strengthened to a limited extent by the project. The improvement in infrastructure – especially roads, telecommunications and ice plants – has resulted in better prices for artisanal fisherfolk.</p>

output	Indicator	Summary of Progress	Remarks
<p>Access of AFC and PFT households to credit enhanced.</p>	<p>Proportion of target hh enjoying access to formal credit by 31 March 1998 increases by 40 per cent in India, 90 per cent in Bangladesh and 25 per cent in Sri Lanka.</p> <p>Weighted average cost of formal and informal credit to target hh by 31 March 1998 decreases by IND 35 percent, BGD 35 percent and SRL 40 percent. Average annual amount of formal and informal credit used by target hh by 31 March 1998 increases by IND 40 per cent, BGD 50 per cent and SRL 40 per cent.</p>	<p>Access to formal sources of credit in IND has increased in locations where the project works through NGOs, with over 50% of the hh reporting access to bank credit.</p> <p>In SRL, with more cycle traders becoming members of MFAR, co-operatives' access to credit has improved significantly. It is expected that all members will gain access to formal credit if they save for a period of 6 six months on a regular basis.</p> <p>In BGD, all households which have participated in the project's intervention have gained access to credit.</p> <p>A 10 to 20% drop in average cost of credit is reported by target hh in IND and SRL, while it is of an order of over 30% in BGD. Much of this reduction is through better terms and reduction in the rates of interest. Over half the credit requirements of the target households accessed through NGOs are met through formal sources of credit in IND, BGD and SRL.</p>	<p>Access to credit has improved in all locations where the project has intervened for over a period of three years. With greater understanding of the requirements of artisanal fisherfolk and petty fish traders on the part of financial institutions, the amount of credit made available for their use has increased considerably.</p>

output	Indicator	Summary of Progress	Remarks
<p>Dissemination strategy planned and implemented.</p>	<p>Number of target GO and NGO users reporting increased awareness of PHF issues by 31 March 1998: IND 13, BGD 21 and SRL 3.</p> <p>Following number of enquiries to project [MD 200; BGD 100 & SRL 50] of which following converted to activities [IND 50 per cent; BGD 60 per cent and SRL 50%].</p>	<p>Awareness of post- harvest issues has increased considerably since the project was initiated. This is reflected in the inclusion of post- harvest into the action plans of the DOFs and MFAR in IND and SRL respectively. Besides government agencies, a large number of community organisations have taken up post- harvest interventions on their own.</p> <p>Leaflets in local languages are in demand, especially among individuals who work closely with the community. In areas where literacy levels are relatively high, impact has been large.</p> <p>The final newsletter is now under preparation. The newsletter has strengthened the profile of the project, especially among institutions concerned with artisanal fisheries. Requests have been received for more information on the project's initiatives.</p> <p>Videos produced by the project have been dubbed in local languages and are being shown at seminars and exhibitions attended by fisherfolk and development agencies. A few copies have been given to the project's partner agencies. There are being used and shown to fishing communities. Feedback has been positive.</p>	<p>All publicity material produced by the project will be handed over to the DOF or MFAR as the case may be. However, what is to be done with the books and reports that are in the project's library is yet to be decided.</p>

output	Indicator	Summary of Progress	Remarks
<p>Effective linkages among CBOs, GOs and NGOs facilitated.</p>	<p>NGOs and GOs undertake new and joint action plans to address PHF issues [MD 3; SRL 1 or other issues BGD 6] by 3 1 March 1997.</p> <p>Target CBOs able independently to access support from financing and development agencies (IND 22; BGD 1; SRL 1] by31 March 1998.</p> <p>CBOs, NGOs and GOs in IND, BGD and SRL interact with increased frequency and consistency and exchange among them resources, knowledge and skills by 3 1 March 1998.</p>	<p>The project has been trying to bring about greater interaction between the various departments, banks and NGOs. In Tamil Nadu, this has resulted in the recognition of the work done by one of the project's partner NGOs, ROSA. This has enabled some of the members of its credit groups to access funds available with government.</p> <p>In SRL, the linkages established by the project between the fishermen's co-operatives and the multi-purpose cooperatives in the hinterland has resulted in increased interaction between the MFAR and the Department of Co-operatives.</p> <p>In BGD, the project has sought to raise the profile of SBN communities with the DOE At a meeting with the Minister of Fisheries, the Project Field Manager discussed the possibilities for intervention by government agencies amongst these communities.</p>	<p>The project has taken its first steps towards forming links between NGOs and GOs. The cyclone relief and rehabilitation work in Andhra Pradesh is being used as a test case.</p>

Appendix 2 : Post-Harvest Fisheries Project

Visitors to Project Office in Chennai during 1997/1 998

VISITORS				
Date	Name(s)	Institution	Reason	Comments
17-21 February, 1997	Mr D Knowler and MS B Cooney	Investment Centre Divison, FAO	To discuss and identify priority transboundary environmental problems in the Bay of Bengal region with a view to developing an agreed strategic action programme	This is a Block B proposal through the Global Environment Facility
16-21 March	MS Ann Gordon	Natural Resources Institute, Social Sciences Group, UK	To conduct a workshop and present the preliminary findings of the marketing studies funded by DFID's Fisheries Research programme	Visit and workshop organised by DFID-PHFP.
23 February- 16 March	Mr Ansen Ward and MS V Papadopolus	Natural Resources Institute	To undertake and facilitate the first in- country activities of the monsoon losses research project	Visit and workshop organised by DFID-PHFP.
17 March	Mr P Barker	Freelance Photographer	To take photographs of DFID-PHFP's activities in Chinnakuppam	Visit organised through British Council, Delhi.
3 April	Mr Satish Chandra Roy. Md Liaquat Ali	State Minister, Ministry of Fisheries & Livestock. Director General of Fisheries, Department of Fisheries.	To discuss issues affecting estuarine set bagnets and coastal fishing communities in Bangladesh.	The discussions also involved staff from the FAO- BOBP
25 April	Dr Mohan Joseph	Mangalore College of Fisheries	To discuss travel itinerary and work programme	Ongoing in-country support to research programme.

Date	Name(s)	Institution	Reason	Comments
4-11 May	Mr Jock Campbell	Integrated Marine Management.	To undertake and facilitate the IAS workshop in Madras.	Visit was coordinated with other inputs into the region with only local travel costs being met by DFID-PHFP.
5-10 May	Mr C Morrice	DFID Northwest Aquaculture Development Project (based in Bangladesh)	To take part in the IAS workshop	Visit organised through Aid Office, Dhaka.
6-10 May	Mr Mick Blowfield	Natural Resources Institute, Social Sciences Department, UK	To discuss findings of impact assessment study undertaken in Bangladesh and take part in the IAS workshop.	Visit and workshop organised by DFID-PHFP.
1 June	Ms S Sen and Mr J Marki	FAO-BOBP Evaluation team	To discuss relationship between the FAO-BOBP and this project	Discussions held with project staff as Project Field Manager was on leave.
20 September	Dr Md Farid Shah Secretary (Planning)	Government of Bangladesh	To discuss activities of the Bay of Bengal Programme	This visit was organised through ICLARM.
15 October	Dr Timothy Ford	Public Health Dept., Harvard University	To discuss activities and links to the Bay of Bengal Programme	
29 October	Pratima Krishnan and M S Varadan	OM Consultants	To present study on institutional strengthening of the Tamil Nadu DoF	Presentation was also made to Director of Fisheries, TN and staff
4 November	Michael Pickstock	World Radio	Courtesy visit	
7 November	Dr I Benson and MrIAhmed	World Bank	To discuss possible inputs into coastal fisheries, Bangladesh and discuss the shrimp aquaculture situation in India	Fact-finding mission.
26 February 1998	Mr Ansen Ward and Ms V Schoen	Natural Resources Institute, UK	Research workshop to discuss findings of research on "Monsoon Losses"	Workshop organised through project m-country support to research programme.

Consultants commissioned during 1997/1998

CONSULTANTS					
Country	Date	Duration	Name	Institution	Tasks
Sri Lanka	30 December to 15 January	18 days	Dr Ivan de Silva	Institute of Fundamental Studies	To conduct qualitative studies on the impact of ice boxes on 22 ft craft
Sri Lanka	5-10 January	6 days	Mr Babu Rao	Andhra Pradesh Fisheries Corporation	To review procedure for making FRP boxes in Sri Lanka
India/Sri Lanka	February-April	3 months	M S Ashok	Catalyst Management Services, Bangalore	Conduct IAS and submit report by 31 May 1997 which was completed on schedule.
Bangladesh	as above	3 months	S Alamgir	Socioconsult Ltd, Dhaka	As above.
India	5-11 May	7 days	Steve Jones	Coverdale Development, UK	Facilitation at workshop to analyse and report on the Impact Assessment Study.
India (and regional)	28 April- 11 May	13 days	J. Campbell	IMM Ltd	Review Phase I-III of project and assist in May workshop.
Bangladesh	6-26 May	21 days	M Blowfield	NRI	Participate in IAS workshop, India and review of project activities, Bangladesh.
Sri Lanka	10-19 June	10 days	M Blowfield	NRI	To assess options for project withdrawal from the cycle trader activity.
India	14-21 August	8 days	J Campbell	IMM Ltd	Facilitation at workshop to draw up an implementation plan for the cyclone rehabilitation project.
India (and regional)	5-8 January 1998	5 days	Steve Jones	Coverdale Dev. UK	Facilitate at workshop to finalise Intervention model.
Bangladesh	14 February-6 March 1998	21 days	M Blowfield	NRI	Project evaluation
India	20-24 April 1998	4 days	Mike Wilson and others	Mission from Development Co-operation Office, Delhi	A pre-feasibility mission to assess scope and prospects for working with coastal fishing communities.

Appendix 3 (Post- Harvest Fisheries Project)

STATUS OF POST-HARVEST FISHERIES IN SOUTH ASIA

Post-harvest fisheries concerns activities from the time fish is landed or harvested to the time the fish reaches the consumer. Post-harvest covers a whole range of interrelated and interlinked issues and must be seen as a broad-based approach to tackling the economic, institutional, social, environmental and marketing aspects of the supply and demand of preserving, processing and distributing fish and fish products. At the artisanal fishing community level there are a wide range of different issues which must be fully understood before technologies which would be suitable for small-scale fisheries can be developed and for the resulting interventions to succeed.

Fisheries has been an important part of the national economies of India, Bangladesh and Sri Lanka for many years. It helps to augment food availability, provides employment to thousands of people in the rural sector and earns sizable foreign exchange. With the extension of Exclusive Economic Zones in the 1970s in India and Sri Lanka, the potential of these resources became more apparent and successive development plans of these Governments have emphasised the importance of increasing production from both inland and marine resources and, more recently, from culture fisheries which has been very successful. India, for example, is now one of the largest producers of fish in the world with a total production of 4.7 million tonnes during 1993-94. However, to achieve this, Governments have focused on increasing the level of mechanisation and motorisation of the fishing fleet, introduced innovative methods of fishing, improved infrastructural development and the organisation of fish transport, storage and marketing. In later years there has been an increased focus on the export market and on expanding aquaculture to supplement capture fisheries.

In more recent years there has been a greater focus on the export of products and a resultant increase in concern for post-harvest issues. While these export-oriented issues have received considerable attention, post-harvest issues within the domestic market have been of less immediate concern to the industry and governments. However, this is slowly changing, as there is greater awareness of the needs of the poorer producers, but there still remains a significant policy gap between the production and post-harvest sub-sectors.

India has the largest coastline of these three countries. Some nine million people are said to depend on the fishing industry in India as a main source of income. Of these, over five million are actively involved in fishing. Fisheries contributes about 2.4% of the GDP, with 208,600 mt of marine products being exported from India in 1992/3 with a value of Rs 17,674 million (Table 1). Sri Lanka declared its EEZ in 1976 and has approximately 230,000 square kilometres of marine fishing rights. The present production is about 200,000 mt from marine and inland fisheries and aquaculture, and it is estimated that there are over 111,000 marine and inland fishermen employed by the sector. In addition, many people engaged in fish processing and distribution have few alternative sources of income. The fishing industry contributes about 2.0% of the GDP of Sri Lanka. Although Bangladesh has only a 480km coastline, it offers a vast and varied fisheries potential in its fresh, brackish and marine waters as it is blessed with innumerable rivers, tributaries, lakes and a huge floodplain during the monsoon. The present production is just over one million tonnes of which 830,000 mt is from inland fisheries and the 270,000 mt from the marine sector. Nearly 12 million people are directly, or indirectly, engaged in activities related to fisheries, of which about 1.2 million of those are employed full time. Fisheries contributes nearly 3% to the GDP in Bangladesh.

The potential for expanding production for both domestic consumption and export is believed to be considerable in these countries. The marine production will come mainly from expansion of deeper water resources and from brackishwater aquaculture. The inland fisheries expansion will come mainly from more intensive forms of aquaculture methods.

Table 1. Number of people actively involved, or dependent, on fishing

Country	Coastline	Numbers dependent on fishing	Numbers actively involved in fishing
India	8000 km	9,000,000	5,000,000
Bangladesh	480 km	12,000,000	1,200,000
Sri Lanka	230,000 sq km	200,000	110,000

In terms of production aimed at the domestic market, there is still considerable scope for improvement in the way fish is handled, processed, distributed and marketed. There is also scope for improving the distribution of opportunities to benefit the fishing communities from such development through a greater focus on the traditional producers and processors. Given the limited scope for expanding inshore catches in the long-term, there is a need to increase opportunities for these participants through a greater emphasis on post-harvest value-added production at the community level. The scope for this in all three countries is considerable.

Table 2. Economic indicators of the importance of fisheries

Country	Total production (metric tonnes)	Exports of marine products (metric tonnes)	Value of marine products	Contribution to GDP
India	4,700,000	208,600	Rs 17,674 million	2.4%
Bangladesh	1,200,000	25,000	Taka 5,000 million	3.0%
Sri Lanka	275,997	1,328	Rs 855 million	2.0%

Fish is one of the most perishable commodities and considerable wastage occurs after capture. Small-scale fishermen face problems in handling, transporting and marketing fresh fish under difficult conditions at high ambient temperatures. The absence of adequate facilities onboard the fishing craft and onshore prevent the distribution of good quality fish. As a result microbial spoilage represents the most serious loss of wet fish, and contamination by pathogenic bacteria can have important implications for the export trade, particularly as more stringent international quality parameters are applied worldwide.

Large quantities of fish are also discarded onboard shrimp vessels, because the economic returns are insufficient for them to bring the by-catch back to shore. Large quantities of pelagic fish are caught at certain times of the year and cannot be processed. Improvements are possible but technology alone cannot succeed without a thorough understanding of the social and economic factors and strong support from the Government in tackling the problems of poor infrastructure that affect small-scale fishing communities.

The trend now is towards food that can be rapidly prepared – convenience food. Value addition is brought about by improved handling, processing and storage techniques and the use of better packaging materials for fish products in the domestic and export market. The range of products includes formulated spreads, dips, salad ingredients as well as main dishes. Preparations involve not only shrimp but also a wide variety of fish species.

Fishing craft in small-scale fisheries are generally small. These traditional craft fish the area of the sea close to the shore. The gear they use will often determine the fishing methods that are employed. As the craft are small there is very limited space onboard, which does not favour proper handling and preservation of the catch. Considerable difficulties are faced by the fishing communities in handling, distributing and marketing fish. The lack of suitable infrastructure

including transport links and availability of ice increase the problems of rapid spoilage. Landing sites are often remote and difficult of access, and it is often uneconomic to provide the necessary infrastructure for proper preservation of fresh fish either onboard or immediately on landing. Even when landing sites and roads exist, transport of catch is not cost effective. Therefore, a large proportion of the catch is processed by traditional methods of salting, drying and smoking.

There is no better or more suitable way of preserving fish than by icing it and keeping it cool. This applies equally to all levels of the post-harvest fishery sector. However, it has to be technically and economically feasible. Unfortunately, this is not always the case in small-scale fisheries. The limited use of ice may be due to its high cost or a lack of knowledge on the beneficial effects of using ice. The easiest way is to use an ice box which should combine the elements of insulation, sturdiness and low cost through use of locally available materials. Boxes should be portable and easy to handle and be designed to meet the rigours of a marine environment and the requirements of fishing craft.

Therefore, if ice is unavailable or only used occasionally, the majority of the catch is processed by using traditional methods of salting, sun-drying and smoking. These result in a product that is less perishable than wet fish, and can keep for several weeks depending on how well it is dried. However, unless processing is very careful, physical losses can occur with a resultant loss of quality and quantity and subsequent value to the fish processor.

Women play a vital role in post-harvest activities, particularly in the small-scale sector-mainly in shore-based activities such as handling, processing and marketing the catch. Women have traditionally been involved in fresh and dried fish marketing which can be seen as an extended activity of the production process. They provide a crucial link between the supplier and the customer in rural areas. However, women often face difficulties in procuring, distributing and marketing wet fish and fish products. Any initiatives in the small-scale post-harvest sector must take into account the role played by these women.

The project's role in post-harvest fisheries

With the increasing pressure on fishery resources, there is worldwide concern over declining fish stocks. India has underlined the importance of developing marine resources in a sustained manner for ecological security, conservation of biodiversity and social equity as reported at a meeting earlier this year in Rome. India, in principle, supports the Voluntary Code of Conduct for Responsible Fishing. Over the last two decades, the inshore areas of all the countries bordering the Bay of Bengal have been subjected to increasing fishing pressure from both large and small-scale sectors. The region's growing population combined with unrestricted, open access to fishing grounds, are among the factors that have led to a decline and disruption in the patterns of traditional fisheries. Increasing demand from international markets for highly priced shrimp and internal demand from growing urban populations, have led fishermen to cater for these markets, sometimes to the detriment of their traditional, often subsistence-based fishing and localized marketing. Undoubtedly, in many cases, fortunes have been made at the expense of long-established traditional fishing practices. Existing management strategies must change to address the current and future problems faced by the industry. However, solutions are not easy as they require addressing a complex, and sometimes conflicting, range of issues at both the micro and macro level. These require careful policy formulation and planning to avoid conflict between the various policies and strategies in other sectors and within the fisheries sector itself.

Instead of promoting fishery capture and production oriented practices and putting the already overburdened fisheries under even more strain, the focus must now be on improving the management of existing resources. It is paramount that these resources are maximised by reducing wastage and adding value and by making the most, or indeed more, of what is already caught. Improving the efficiency of post-harvest handling and the processing and marketing of fish can have a significant impact on the incomes of primary producers and market intermediaries. Moreover, the local consumer also benefits through the availability of better quality fish. There are also large domestic markets in these countries that have a considerable potential if the processing and packaging of currently low-value fish is carried out efficiently and hygienically by small-scale fish processors and retailers in the traditional fisheries sector.

Appendix J

NACA STATEMENT TO THE BOBP ADVISORY COMMITTEE

On behalf of the NACA Organisation, and as Vice-Chairman of NACA, I am pleased to attend this important Technical Advisory meeting of BOBP and to present NACA's statement. We thank the BOBP for the invitation to attend this meeting.

NACA, as many of you know, is a regional inter-governmental organisation promoting the development of sustainable aquaculture in inland and coastal areas in the Asian region. The NACA program is based on co-operation between countries in research, training and information exchange, and technical assistance. It attaches strong emphasis to Technical Co-operation among Developing Countries (TCDC) in implementing its programme. Members of NACA include nearly all the countries who participate in BOBP. NACA therefore welcomes the opportunity to co-operate closely with BOBP to assist its member countries in the Bay of Bengal region, and to assist their coastal communities in sustainable aquaculture development.

NACA has always laid a strong emphasis on coastal aquaculture development, and on sustainability in its work program. Its ongoing and planned projects and programmes in this region include :

- * A regional programme on aquatic animal quarantine, certification and disease information systems for aquatic animals, a co-operative project between NACA, FAO and OIE, which is supported through the FAO Technical Assistance Program (TCP) project on "Assistance in Responsible Movement of Aquatic Animals". The first workshop was held in January 1998. Over the next two years, the project will assist countries of the region in developing management strategies to reduce risks of spread of aquatic animal diseases through movement of live aquatic animals.
- * A regional programme for the development of marine fish culture, which is in an early stage of development. A regional expert meeting is planned for next month to develop a regional project on marine fish breeding and nutrition, with an emphasis on grouper. BOBP has also requested NACA to assist in the joint organisation of a regional seafarming workshop planned for Indonesia within the next year. A workshop on marine ornamental fish breeding is planned with Sri Lankan authorities in the near future.
- * A recently completed study of Research Priorities in Aquaculture, with FAO co-operation. It has identified various regional co-operative research activities in coastal aquaculture, which are currently being further explored.
- * Training programmes on coastal aquaculture have always received high priority in NACA. In the near future, special regional training is planned, in co-operation with Indian research institutes, on sea cucumber, mollusc culture and marine ornamental fish breeding.
- * A planned project to develop a code of conduct for responsible shrimp culture in co-operation with FAO. NACA will work with FAO in development of a regional project on this subject, on the basis of elaboration of the FAO Code of Conduct for Responsible Fisheries as applicable to shrimp aquaculture.

The NACA Governing Council last December approved a new regional programme to be implemented by NACA in co-operation with other relevant organisations-a programme on Sustainable Aquaculture for Rural Development. This programme will have a component on sustainable aquaculture for coastal communities for poverty alleviation and food production. As the development of coastal aquaculture should be seen in the broader context of coastal management and planning, this would be an ideal area where NACA could co-operate with BOBP and other concerned agencies. A formulation mission is planned later this year. Consultation with BOBP could be helpful in developing the programme.

NACA is also planning a Conference on Aquaculture in the Third Millennium to be held in January 2000, in Thailand. This conference will review past successes and needs in aquaculture and help chart a direction for regional aquaculture development beyond the year 2000. This meeting may offer good scope for collaboration.

In summary, the member countries of BOBP and NACA are virtually the same. NACA would welcome the opportunity for further co-operation with BOBP for the benefit of our member countries. Some activities will be implemented soon - such as the planned seafarming workshop in Indonesia - but there are undoubtedly more areas where NACA could provide aquaculture inputs to coastal communities and to the fisheries programmes of the BOBP. NACA would be pleased to further explore these areas of co-operation.

Finally, the next Governing Council meeting of NACA will be held in this beautiful island of Sri Lanka in December of this year. I would take this opportunity to extend an invitation to BOBP to participate in this meeting, and further explore opportunities for co-operation.

A.M. Jayasekara,
Vice-Chairman, NACA Governing Council.

Publications during the BOBP's III Phase

Here is a list of BOBP publications out during the Programme's III Phase. Copies are available on request at the BOBP office. Nominal cost is charged for workshop reports.

Newsletter, Bay of Bengal News

September 1995, March 1996, June & September 1996, December 1996, March 1997, June 1997, September 1997, December 1997, March 1998, June 1998.

Reports and manuals

BOBP/REP/70	Report of the 19 th Meeting of the Advisory Committee. 16-17 January, 1995, Jakarta, Indonesia.
BOBP/REP/71	Towards Sustainability : Needs and Concerns of Aquatic Resources and Fisheries in the Bay of Bengal Region and Project Ideas to Facilitate Their Sustainable Management (A report submitted to the IOFC Committee for Development and Management of Fisheries in the Bay of Bengal).
BOBP/REP/72	Sri Lanka/FAO National Workshop on Development of Community-Based Fishery Management. 3-5 October, 1994, Colombo, Sri Lanka.
BOBP/REP/73	Report of the 20 th Meeting of the Advisory Committee. March 26-29, 1996. Pulau Langkawi, Kedah, Malaysia.
BOBP/REP/74	National Workshop on Fisheries Resources Development and Management in Bangladesh, 29 October-1 November, 1995. Dhaka, Bangladesh.
BOBP/REP/75	Report of the 21 st Meeting of the Advisory Committee. 12-13 February, 1997. Bangkok, Thailand
BOBP/REP/76	Workshop on Integrated Reef Resources Management in the Maldives. Male, Maldives, 16-20 March, 1996.
BOBP/MAG/21	Fishes of the Maldives
BOBP/REP/77	Report of the 22 nd Meeting of the Advisory Committee. 23-24 September 1997, New Delhi, India
BOBP/REP/78	National Workshop on Community-Based Fisheries Management in Thailand. 14-16 February, 1996. Phuket, Thailand.
BOBP/REP/79	Carrying Capacity of Pulau Payar Marine Park, Malaysia. by Li Ching Lim
BOBP/REP/80	Report of the 23 rd Meeting of the Advisory Committee. 27-28 March, 1998. Negombo, Sri Lanka.

Other Publications

- Regional Workshop on the Conservation and Sustainable Management of Coral Reefs – Report of a Workshop organized jointly by the M.S. Swaminathan Research Foundation and the BOBP. 15-17 December, 1997.
- Brochure on BOBP

Miscellaneous awareness materials of fisheries management:

1. Brochures

Emerging trends and prospects in fisheries management by Kee-Chai Chong.

2. Posters

- I am a steward
- Our sea, our wealth
- A brief history of world commercial fishing
- A simplified model of how fish stocks can be managed
- Ghost fishing
- Marine resources of the Maldives

3. Postcards Our sea, our wealth

4. Video Shanmugham's dilemma.
(Street play presented by fisherwomen of Kasimedu, near Chennai)

5. T-shirt Save our seas

6. Ornamental fish identification cards in color for divers, exporters and fisheries and Customs officials of Sri Lanka.



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