

The Journal of

**For Fisheries Management
BAY OF BENGAL PROGRAMME**

Sponsored by the Governments of Denmark and Japan

BAY OF BENGAL NEWS

Vol.II No. 15

DECEMBER 1999

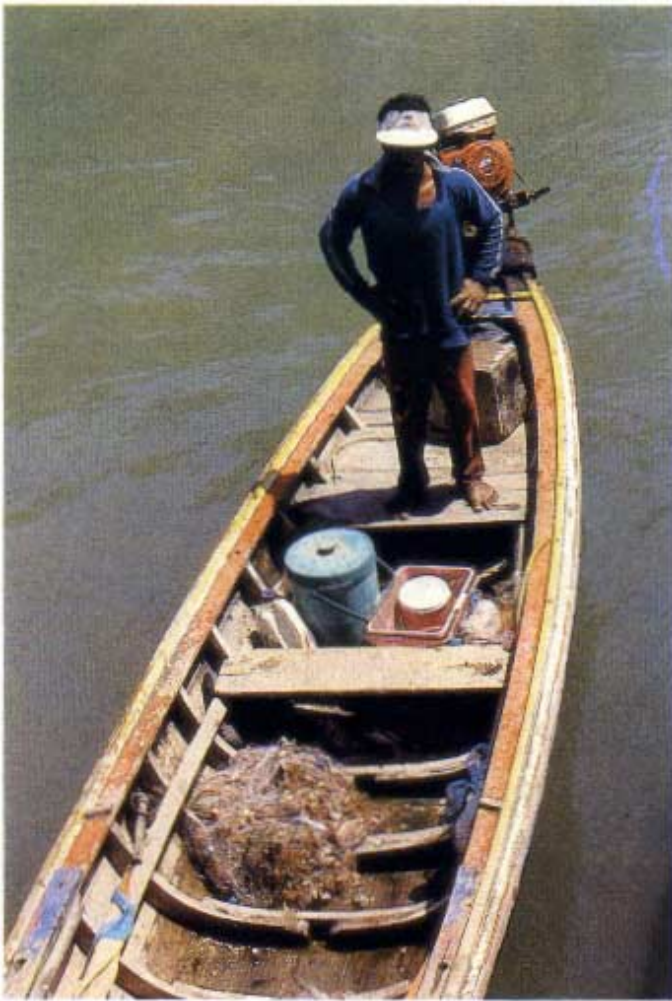
Meetings at Phuket, Chennai and Alor Setar *signal* new directions for the future

It was an eventful October and November, 1999! The BOBP organised three major regional consultations – in Phuket, Thailand; Chennai, India; and Alor Setar, Malaysia. The three meetings led to three major documents – the Phuket Resolution, the Chennai Declaration and the Alor Setar Declaration.

What happened at the three meetings, what was decided, and what these mean for the future, are briefly reported on the pages that follow, along with the texts of the Phuket Resolution, the Chennai Declaration and the Alor Setar Declaration.



24th Meeting of BOBP's Advisory Committee, Phuket, Thailand, 13-16 October, 1999.



It was a significant Advisory Committee meeting, being the last under the auspices of an externally-funded BOBP. There were 28 participants and observers from member-countries, NACA, SEAFDEC and BOBP.

The Committee appreciated the findings of the two-member Mission that documented the BOBP's lessons and outputs.

The Indian delegation announced that the Government of India agreed in principle, subject to conditions, to the "Block B" activity supported by the World Bank Global Environment Facility or GEF and SIDA – "Sustainable Management of the Bay of Bengal Large Marine Ecosystem." The Committee reaffirmed its support for the GEF-supported effort. It emphasised that the activity will be a logical evolution of BOBP's efforts into the next millennium.

- The Committee listed important problems and issues confronting fisheries development and management in the Bay of Bengal region.
- Member-countries strongly endorsed the need to either continue the BOBP or evolve a new regional mechanism which has the ability to address critical and important issues and concerns relating to fisheries development and management. They recommended that the "exact nature,

mandate, constitution and cost-sharing of such a regional mechanism be evolved through consultation among representatives of member-countries, with support from the FAO.

Since the process to evolve a regional mechanism would take time, the Committee requested the FAO to extend the third phase of BOBP to utilise funds that remained, to complete ongoing activities, provide a bridging function during the intermediate period and assist member countries in the process of evolving a new regional mechanism.

- The Programme's library, negative/slide/videotape collection, equipment and vehicles will be handed over to the GEF/SIDA-supported activity.
- The meeting adopted the Phuket Resolution (below).

The Phuket Resolution

Conscious of the importance of fisheries and aquatic resources as an essential sector of development of the nations surrounding the Bay of Bengal and the unique and relatively high dependence of millions of fishers and coastal peoples on the ocean and coastal environment for their food and livelihood security;

Realizing that the fisheries sectors of the countries around the Bay of Bengal have to in the future

- 1) increase or at least stabilize fisheries production to ensure food and livelihood security for a large number of people,
- 2) ensure quality fish and fish products in order not to jeopardise trade, which earns valuable foreign exchange,
- 3) protect themselves from non-trade tariff barriers on fisheries,
- 4) fulfil requirements of agreed-to Conventions and Codes, and
- 5) better manage their fisheries and conserve their aquatic environments to provide sustainability;

Recognising that, while fisheries is primarily a national concern driven by a country's needs, there are a large number of issues in fisheries that can be more appropriately and efficiently addressed in a regional context through collective action;

Recognising that the Bay of Bengal Programme of the FAO of UN has provided valuable and noteworthy services to the countries in the Bay of Bengal region in enabling and facilitating the development and management of small-scale fisheries over the last 20 years and the fact that the project is coming to an end in December 1999;

Realizing that there is a need for technical and management advisory services in the areas of fisheries development and management, conservation of aquatic resources, quality

assurance of fish and fish products, fair and free trade of fish, fish marketing development, human resources development and building the capacity of national fishery agencies and the promotion and success of such services can be facilitated through regional co-operation;

Considering that the said co-operation can best be achieved through the establishment of an inter-governmental organisation (IGO) in the Bay of Bengal region carrying out its activities in collaboration with countries, organisations and commissions that may be able to provide financial and technical support;

We, the Representatives of the Fishery Agencies of the Governments of Bangladesh, India, Indonesia, Malaysia, the Maldives, Sri Lanka and Thailand, having met in Phuket, Thailand, 13-16 October 1999 for the 24th Meeting of the Advisory Committee of the Bay of Bengal Programme of the FAO of UN, now therefore:

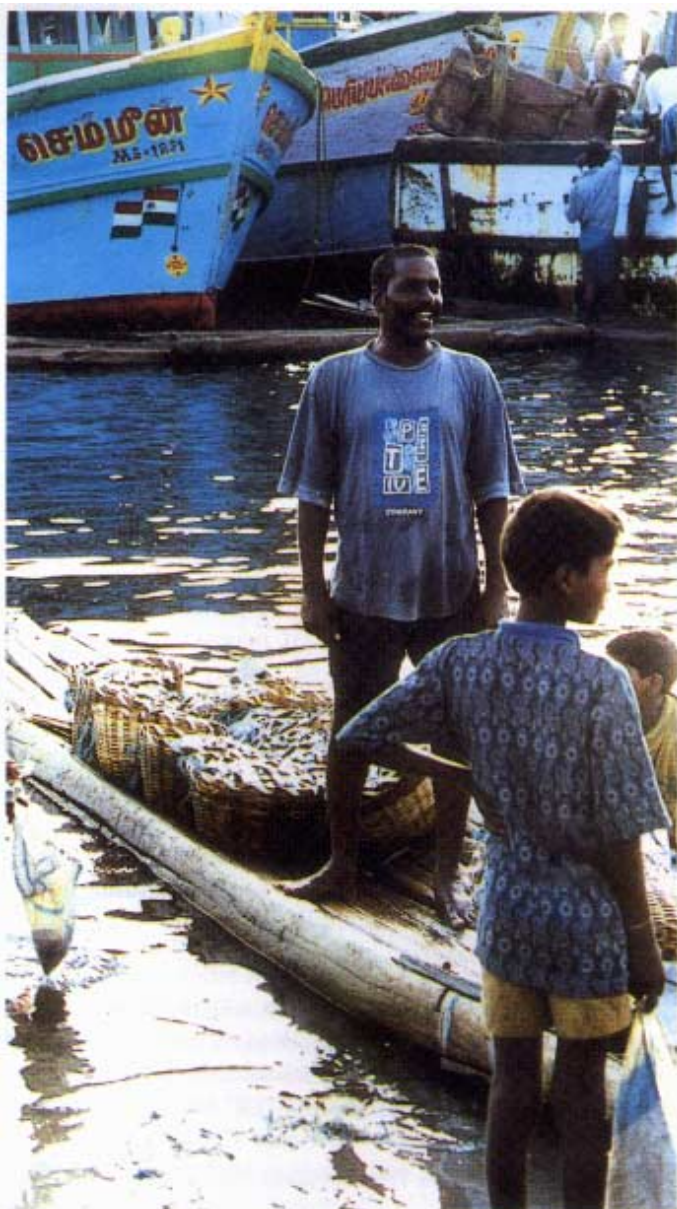
Resolve to come together to consider the establishment of an Intergovernmental Organization for Technical and Management Advisory Services for Fisheries Development and Management in the Bay of Bengal Region.

Request the Food and Agriculture Organisation of the UN for advisory and financial support in the formulation and establishment of such an intergovernmental organization.

Suggest that senior representatives of the fishery agencies of the member-countries of the Bay of Bengal Programme of the FAO of UN meet at their earliest convenience to design and develop the constitution and by-laws of the proposed intergovernmental organisation, specifying its mandate, its management and staffing, its fund requirements, and evolve mechanisms and guidelines for cost-sharing.

Adopted in Phuket, Saturday the 16th day of October 1999.

Regional Expert Consultation on Cleaner Fishery Harbours and Seafood Quality Assurance, Chennai – 25-28 October, 1999



The BOBP has been promoting Cleaner Fishery Harbours in the Bay of Bengal region, with support from the IMO (International Maritime Organization). Pilot activities have been conducted in India, Thailand, the Maldives and Sri Lanka. These focused on awareness-building among fishery harbour stakeholders on methods of avoiding and overcoming pollution. Four publications brought out during the process:

- Cleaner Fishery Harbours in the Bay of Bengal, BOBP/WP/82
- Dealing with Fishery Harbour Pollution – the Phuket Experience, BOBP/WP/93
- Guidelines for Cleaner Fishery Harbours, BOBP/MAG/17
- Fishery Harbour Manual on the Prevention of Pollution, BOBP/MAG/22

Member-countries of BOBP continue to express keen interest in efforts to upgrade or rehabilitate fishing harbours and fish landing sites, and design new harbours. They strongly endorsed the need for a technical consultation which would build awareness, expose the participants to state-of-the-art technologies and facilitate exchange of know-how and expertise. The consultation was held in Chennai, India from 4 to 7 October, 1999. It brought together fishery harbour managers and administrators, professionals in seafood quality assurance and harbour design from the seven BOBP member-countries. Two visiting experts served as facilitators – Mr J A Scortino, ports consultant of FAO, Rome, and Dr S. Subashinghe of INFOFISH. Participants (31 in all, including consultants and BOBP staff) made a field trip to the Chennai fishing harbour and viewed an exhibition of photographs of the harbour.

The meeting is reported in some detail in the article on pages 21-22. The meeting adopted the Chennai Declaration (reproduced on the following page). The report of the consultation is under preparation.

The Chennai Declaration

Conscious that the countries in South and Southeast Asia contribute more than half the world's marine fish trade, which is worth several billion US dollars;

Realising the importance of fisheries as an essential sector of the development of nations in the region and *underlining* the high dependence of several million fishers and coastal peoples on fisheries for their food and livelihood security;

Recognising the increasing global concern about seafood quality, which has resulted in the imposition of quality standards by some countries;

Concerned that the inability to meet quality standards may result in loss of trade and earnings and jeopardize the livelihood and food security of millions of fishers and coastal peoples;

Realising that fishery harbours and landing sites are a vital link in the chain of events from harvesting to consumption and the interface between harvesting and marketing of fish;

Concerned that many fishery harbours and landing sites in the region have been found to be wanting in some aspects of management, quality, design and provision of facilities and services and *realizing* that there already have been negative repercussions to the situation;

Reaffirming the Code of Conduct for Responsible Fisheries and, in particular, its Sixth Annexure, which clearly gives direction to the management of fishery harbours and landing sites;

Emphasising the immediate and urgent need for rehabilitation of fishery harbours and landing sites and giving direction to the design and development of new fishery harbours and landing sites to enable installations which are well managed, efficient, economically viable, address the needs of users and meet quality and environmental standards;

Realising that the understanding, support and commitment of people's representatives and policy-makers is vitally necessary to enable and facilitate the efforts of fishery harbour and fishery agencies;

We, the Representatives of Fishery Harbours and Fishery Agencies of the Governments of Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand, having participated in the BOBP-FAO/IMO/GOI Regional Expert Consultation on Cleaner Fishery Harbours and Seafood Quality Assurance held in Chennai, India, from 25 to 28 October 1999, now therefore:

1. Emphasize the need for awareness-building amongst consumers, users and other stakeholders on the need for, the benefits and methods of achieving cleaner fishery harbours and landing sites, in order to assure the quality of seafood.
2. *Encourage* the participation of all stakeholders in the formulation, siting, planning, development, management and maintenance of fishery harbours and landing sites.

3. *Recommend* that fishery harbours and landing sites should be located and designed keeping in mind fisheries resources availability and market needs, and have facilities and infrastructure, including laboratory facilities, where necessary, means to ensure safety at sea of the users and natural disaster mitigation facilities, to enable total quality management.
4. *Recommend* that improved fisheries resources information and market intelligence be made available on a continuing basis to facilitate better decision-making regarding fishery harbours and landing sites and in order to ensure their long-term sustainability.
5. *Recommend* the evolution of mechanisms to promote inter-departmental co-operation and coordination for comprehensive and integrated management of fishery harbours and landing sites and to better conserve and protect the environment.
6. *Propose* formulation and rigorous enforcement of rules and regulations, including speedy removal of encroachments, adequate staffing and financial support, to promote and ensure compliance.
7. *Recommend* that fishery harbour and landing site managers should be adequately qualified and trained, especially in seafood quality assurance, handling and processing and general management and that managers be empowered adequately to take decisions, both financial and otherwise, to improve the management of fishery harbours and landing sites.
8. *Suggest* that governments make available funds for rehabilitation and maintenance of fishery harbours and landing sites using among other sources a larger proportion of cess and duties on exports of seafood.
9. *Recommend* the charging of rational tariffs for services provided by fishery harbours and landing sites and incorporation of effective mechanisms for collection in order to generate revenue, which should be used in the management and maintenance of fishery harbours and landing sites.
10. *Suggest* a balanced approach to privatisation of fishery harbours and landing sites (if necessary through the provision of incentives) to reduce the burden on governments and to improve efficiency and quality, without compromising the need to address the needs and concerns of poor fishers and stakeholders.
11. *Strongly recommend* the development of one model fishery harbour and one fish-landing site in each country to act as a working demonstration unit, assist in evaluation of methods/approaches/technologies and be used in the training of managers.
12. *Strongly recommend* that countries seek the support of the Food and Agriculture Organization of the UN and other countries for development of model fishery harbours and landing sites through TCP and TCDC arrangements.

*Adopted on Thursday, the 28th of October, 1999,
in Chennai, India.*

Regional Symposium on Marine Protected Areas (MPAs) and Their Management, Alor Setar, Kedah, Malaysia, 1-4 November, 1999



Dr Bernadette O'Neil of Environment Australia delivered the keynote address on "The need for marine protected areas and marine parks: networks and transboundary management approaches for success." She also presented a paper on "Planning for performance assessment of marine protected areas and marine parks". Mr Alistair Cheal, Coordinator of ReefFish Monitoring with the Australian Institute of Marine Sciences, presented a paper on "System of Monitoring of Marine Protected Areas and Marine Parks: Suggested Model and Experiences".

Four symposium sessions were devoted to "Learnings and lessons," based mainly on experiences from Malaysia, the Philippines and Australia. A field trip was made to the Pulau Payar Marine Park.

The symposium passed the Alor Setar Declaration, reproduced below.

The Alor Setar Declaration

Conscious of the importance of fisheries and aquatic resources as an essential sector of development of nations surrounding the Bay of Bengal and the unique and relatively high dependence of millions of fishers and coastal peoples on the ocean and coastal environment for their food and livelihood security;

Recognising that marine ecosystems and, in particular coastal aquatic ecosystems such as coral reefs, seagrass beds, mangroves, estuaries and lagoons not only harbour a wealth of biological resources of immense present and future benefit to humankind but are also the genetic banks of the oceans, which in addition provide buffers to coasts and protect them from storm surges, damage and erosion;

Concerned that coastal ecosystems are under increasing threat of degradation of habitats and depletion of resources resulting from unchecked and uncontrolled resources extraction, pollution from land and sea, construction, impacts of tourism and upstream activities such as agriculture and forestry;

Realising that degradation of habitats and depletion of resources in coastal ecosystems would have detrimental effects on fisheries and threaten biodiversity, which in turn would jeopardise the food and livelihood security of millions of fishers and coastal peoples;

Recognising the immediate and urgent need for conservation and management of coastal habitats and resources in a precautionary mode;

Reaffirming the Code of Conduct for Responsible Fisheries and the Convention on Biological Diversity;

Realising that one important means of conserving and better managing coastal aquatic resources is to declare certain whole aquatic ecosystems as Marine Protected Areas (MPAs);

Some 40 delegates from member-countries, the Philippines, BOBP and Australia took part in this symposium, which was organised by the Department of Fisheries, Malaysia, with support from the BOBP, and held in Alor Setar, Kedah, 1-4 November, 1999. The symposium objectives were to discuss the need for conservation of fish and aquatic resources and their habitats; provide an overview of the scientific, technical and institutional context behind the use of MPAs for fisheries and aquatic resources management; explore the management strategy of MPAs, evaluate the social and economic prospects of MPAs for developing countries, evaluate and adapt to developing countries any available guidelines on establishing MPAs.

Resource persons were drawn from Environment Australia and the Australian Institute of Marine Sciences. The Deputy Director-General of Fisheries, Malaysia, inaugurated the symposium. He called for pro-active management of the marine environment and its biodiversity. He emphasised the efforts of the Department of Fisheries to create and build awareness on marine conservation, since the establishment of the Pulau Payar Marine Park in 1987. He said that the National Policy on Marine Biodiversity had been launched on 16 April 1998 to help the country implement strategies, action plans and programmes for the conservation and sustainable utilization of its resources.

Recognising from experience that Marine Protected Areas, which set aside clearly demarcated areas of land, water and marine terrain and ensure that they are not subjected to further resource extraction and ecosystem damage, enable the ecosystem to recover, recuperate and rebuild, often acting as a source of recruitment for neighbouring ecosystems;

Emphasising the immediate and urgent need for establishment of a series of large and small, preferably inter-connected Marine Protected Areas in the region to conserve biodiversity and better manage critical aquatic resources;

Realising that the understanding, support and commitment of stakeholders, people's representatives and policy-makers is vitally necessary to enable and facilitate the establishment and management of Marine Protected Areas;

We, the Representatives of Fishery Agencies of the Governments of Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand, having participated in the Malaysia/BOBP-FAO Regional Symposium on Marine Protected Areas and Their Management in Alor Setar, Malaysia, 01-04 November 1999, now therefore:

1. *Emphasise* the need for awareness-building amongst the general public, users and all stakeholders on the need for, the benefits and methods of conserving coastal and marine ecosystems and managing aquatic habitats and resources through the establishment and sustained management of Marine Protected Areas.
2. *Recommend* the establishment and sustained management of Marine Protected Areas in the region as an important tool for environmental conservation and fisheries management.
3. *Encourage* the participation of all stakeholders in the formulation, siting, planning, establishment and management of Marine Protected Areas to ensure their sustainability.
4. *Promote* the need for long-term sustainability of Marine Protected Areas, and careful balancing of such efforts with other coastal activities such as fisheries, ecotourism, industrial activities and construction of infrastructure.
5. *Recommend* the need for integrated, multi-disciplinary planning and implementation of integrated coastal zone management and development efforts to ensure their long-term sustainability.
6. *Ensure* the use of Ecologically Sustainable Management (ESM) as guiding principles for integrated coastal zone management and development to ensure that establishment of Marine Protected Areas does not in any way reduce focus on the need to conserve and sustain other ecosystems.
7. *Recommend* the evolution of mechanisms to promote inter-agency co-operation and coordination for comprehensive and integrated management of Marine Protected Areas in the context of integrated coastal zone management and development.
8. *Suggest* the need for systematic and integrated planning processes to keep in mind the inter-connected nature of coastal and other ecosystems.

9. *Recommend* the evolution of a legal framework to facilitate and enable the establishment, regulation and management of Marine Protected Areas.
10. *Propose* the formulation and rigorous enforcement of rules and regulations with adequate staffing and financial support to promote and ensure compliance.
11. *Recommend* the evolution of legal and administrative mechanisms to adequately regulate and control impacts on Marine Protected Areas from upstream and adjacent activities.
12. *Suggest* that governments make available funds for the establishment and long-term management of Marine Protected Areas using among other sources a larger proportion of cess and duties on economic activities such as fisheries and ecotourism, which benefit directly from Marine Protected Areas.
13. *Recommend* the charging of rational tariffs for eco-friendly activities and use of Marine Protected Areas, which should be used for the maintenance and management of Marine Protected Areas.
14. *Suggest* the need to consider cost-sharing amongst agencies to finance the establishment of Marine Protected Areas, including trust funds, which may be needed to help those whose livelihoods are affected by the setting up of Marine Protected Areas.
15. *Recommend* that managers and technical staff of Marine Protected Areas should be adequately qualified and trained and be empowered adequately to take decisions, both financial and otherwise, to improve the management of Marine Protected Areas.
16. *Suggest* the promotion of scientific research and long-term monitoring to ensure the sustainability of Marine Protected Areas.
17. *Strongly recommend* the sharing of knowledge, expertise and experience amongst Marine Protected Areas, nationally and within the Bay of Bengal region, in the context of conserving and better managing the Bay of Bengal Large Marine Ecosystem.

*Adopted in Alor Setar, Malaysia
on Thursday, the 4th day of November 1999.*

STOP PRESS!

BOBP Extended for Six Months

On the basis of the Phuket Resolution adopted by the 24th Advisory Committee of the BOBP, which clearly expressed the views of Member-Governments, the Bay of Bengal Programme has been extended till June 2000, using savings from the Programme. The BOBP's mailing and e-mail addresses, as well as the telephone and fax numbers, remain the same till June 2000.

BOBP At The Crossroads

by Kee-Chai CHONG

After 20 years, many fisheries stakeholders are calling for a continuation of what BOBP is best at doing – pooling and leveraging limited resources to help the poor; acting as a catalyst and facilitator; bringing new ideas to Departments of Fisheries; communicating awareness on fisheries management to the departments.

Today, BOBP is at the critical crossroads. For the last 20 years (1979-1999), and in particular during the last five (1995-1999), the FAO has sought to concentrate certain resources through the BOBP for problem-solving in the Bay of Bengal region. It has had the strong financial support, goodwill and commitment of our external donors and member-countries in the process. The donor community comprises Sweden, Denmark, Japan, AGFUND, IMO, UNDP and UK (ODA/DFID). The member-countries are Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand.

BOBP chose to focus throughout the programme duration on small-scale fisheries and its communities of

stakeholders as its target clientele. (See pages 25-27). It faithfully stuck to this founding rationale and followed a logical phase-by-phase progression of intervention in the fisheries sector and coastal environment. While the first and second phases had an R&D orientation, the third is largely management-oriented.

In addition to these three core programme thrusts, BOBP is also fortunate to have received donor support on post-harvest technology for fisheries and on cleaner fisheries harbour management and seafood quality assurance. The groundwork to establish BOBP way back in the late 1970s with the support and active participation of both donor and member-countries resulted in a well-

conceived, systematic and well-integrated programme.

BOBP has both been responsive and proactive in its work, frequently meeting requests from its member-countries, under advice from its Advisory Committee. From the beginning, the Advisory Committee has been represented by senior government officials from member and donor countries, as well as by FAO, interested observer countries, and international/regional institutions active in fisheries and the coastal environment.

Cost-Effectiveness

As per the Project Document, the Project's staff was meagre: a Programme Coordinator/Senior Fish-

"BOBP chose to focus throughout the programme duration on small-scale fisheries."



eries Management Adviser for five years and a Communication Adviser for three years. Recognising the critical role and contribution of human resources to the success of project implementation, BOBP took steps to overcome its personnel limitations.

For the entire five years of the Third Phase, every effort was made to stretch and leverage allocated funds from donors to do justice to the scope and content of the Third Phase work plan. Some examples.

1. Resource Persons for BOBP workshops, consultancies and field activities were provided to BOBP at nominal cost to the Programme.
2. Workshop and other operational costs were shared with interested and willing sponsors, mainly to defray the direct workshop expenses of participants. Smart networking is essential to do more with less.

Emerging Trends and Benefits of Management

Member-countries are beginning to shift steadily from a development mode to a management mode. Management in many member-countries is no longer piecemeal or *ad hoc*, responding only to outbreaks of conflict or crisis, but is proactive and precautionary. There is less and less emphasis on the regulatory dimension of management, more and more recognition that management is essential and in the public interest because it entails responsible use of fisheries and aquatic resources.

Along with this shift, there is a positive transformation from the past technobureaucratic approach of resource management to a more participatory stakeholder approach to management.

The planned interventions in fisheries and aquatic resources in the region over the past 20 years have resulted in certain tangible and intangible benefits. At the aggregate macro-level, a greater output of fish has been recorded. However, at the micro-disaggregated level, there have been mixed indicators about per capita availability of fish. It seemed that per capita availability of fish was increasing; but recently Bangladesh reported a decreasing trend. One must point out,

however, that in Bangladesh, more than 80 % of the fish supply is from inland freshwater sources and only about 20 % from marine sources. While marine fish landings have been increasing, the supply from inland freshwater sources has been declining because of several factors — extensive land remodelling through structures for flood mitigation, drainage and irrigation; excessive fishing pressure from a burgeoning population; and habitat degradation.

It is expected that the Programme's benefits will continue long after the 20-year old BOBP closes down. This is because of the kind of interventions BOBP and member-countries have engaged in over the last 20 years. The benefits accrue to target and non-target beneficiaries in different degrees and time-scales — some benefits are almost immediate, a few others are perceived after some time, still others long after such interventions have been completed. Because of the pains taken by BOBP and member-countries to ensure that their activities mesh with one another, the Programme's work will continue long after external funding for it ceases.

Awareness about the benefits, methods and approaches of improved management of fisheries and aquatic resources is now high and steadily growing. Such awareness at all levels has spurred coastal communities to either seek help to address their problems or initiate action themselves. Steady incremental change is noticeable, especially in the mindset of the people, their values, perceptions and attitudes.

Another concrete result observed is that the mode of operation of government personnel involved in BOBP activities over the years has changed for the better. They are now more confident about carrying out field work; at one time they were anxious and nervous about meeting their constituents face to face.

Review of Performance

In reviewing the Programme's performance over the last five years, it is safe to say that the necessary processes to create, build and arouse awareness about the need for, the benefits, approaches and methods for improved management of coastal fisheries and environment protection, have not only been set in motion but achieved. Simple

and direct audio-visual and multi-media awareness campaigns were used, public outreach campaigns were conducted, to reach out to all target groups and stakeholders.

However, the quality of the outputs delivered was not uniform in the seven countries. In most countries, good progress was made toward the objective of sustainable development in coastal communities through an integrated coastal area development and management approach. This is evident from the continuous local community involvement and participation in conservation activities. Economic diversification as another project input to expand or enlarge the sources of income of coastal communities was also successfully implemented — not only through studies but more importantly through local hands-on training. An excellent illustration is eco-tourism as a source of income.

The Programme is happy to report significant spin-offs from BOBP pilot activities in the form of new or additional projects: three new projects in Bangladesh, supported by UNDP, DFID and the Bangladesh Government respectively; one in Indonesia covering four provinces, funded by the Asian Development Bank (ADB); and FAO TCP/SPFS project proposals, one each in Malaysia and Thailand, patterned after BOBP work. The other projects are follow-ups to the Programme's work.

Although infrastructure and social services are outside the ambit of the Third Phase, some countries have integrated BOBP inputs with their ongoing national programmes in capital infrastructure investment. This integrated multi-sectoral approach is clearly preferable to purely management-oriented intervention.

On the containment and regulation of fishing efforts, BOBP member countries have not been as successful, even with the Programme's assistance. Attempts to draw coastal fisherfolk out of fisheries are confronted with the problem of limited job opportunities in rural coastal areas. With alternative jobs or means of other livelihood almost non-existent in coastal areas, it is not fair to ask fisherfolk to leave the fisheries. Replacement and substitution of resource-damaging



"Improved management is essential for maintaining the incomes of small-scale fisherfolk and protecting bio-diversity."

gear with less resource-damaging gear was also attempted to contain and regulate fishing pressure. This was quite successful in Thailand. Lack of funding, however, also constrained greater achievement of this objective. Even so, government awareness about the need to contain and regulate fishing effort is growing. It is accepted as the way forward to manage fisheries sustainably.

BOBP has been successful in its work as catalyst and facilitator. The principles of pooling of resources, cost-sharing, and national execution of activities, have been imaginatively employed to implement Programme activities. To the credit of many member-countries, they responded positively to the innovative mode of project implementation. Besides the agreed annual government cash contribution, a few governments also provided hard cash for joint cost-sharing of activities. For example, the Tamil Nadu Government in India contributed US\$ 30,000 for activities in the state. Contributions from governments in Malaysia and Indonesia made a significant difference to the quality of work of joint activities carried out in these two countries.

After 20 years, many fisheries stakeholders are calling for a continuation of what BOBP is best at doing – joining forces with developing countries by pooling and leveraging limited resources to improve the lives of the poor in coastal communities around the Bay of Bengal; acting as a catalyst and facilitator; bringing new ideas to departments of fisheries; communicating awareness of recent advances in fisheries management to the departments. What is permanent and what continues is the goodwill of the stakeholders towards BOBP and FAO.

Certain setbacks have been encountered, but they have been temporary and resolved overtime. The receptiveness to BOBP work has been high at all levels of government, NGO or coastal communities, as noted by the Mission on documenting the lessons learned from BOBP's experiences.

During the last five years, the principle of national execution and cost-sharing has been actively pursued. Experiences with national execution and cost-sharing have been valuable to the project personnel concerned. It has built up their confidence about carrying out day-to-day work with limited financial support.

These personnel have been able to find ways to overcome financial constraints and develop smart partnerships with their clients. After a few false starts, many joint activities carried out by the project personnel became self-starters. Such success lies at the core of the BOBP's thrust on local capacity-building, institutional strengthening and local capacity utilisation, implemented through nationally-executed and cost-sharing project activities. BOBP is willing to wait until local cost-sharing funds become available.

More effort, however, is required to strengthen the training of trainers at the national level. While those who have participated in BOBP activities have benefited, these trainers need to impart their skills and knowledge widely to colleagues in the Department/Ministry.

Weaknesses remain over the mobilisation and organisation of fisherfolk for direct consultation. There is still some uneasiness on the question of public hearings that involve fisherfolk, and direct consultation with them. In some countries, fisherfolk leaders are able to mobilise and organise their community

effectively. In other countries, this has not been possible. Hands-on community leadership training is a key to such community mobilisation and organisation.

Bay of Bengal Committee (BOBC)

The Committee for the Development and Management of Fisheries in the Bay of Bengal (BOBC), of the Indian Ocean Fishery Commission or IOFC, came into being in December 1981 in Colombo. BOBC is the apex advisory and coordinating body for fisheries development and management in the region. Over the last 20 years, the BOBP has provided valuable inputs into BOBC's deliberations. When BOBC ceased to exist with the termination of the IOFC, APFIC (Asia-Pacific Fisheries Commission) absorbed the BOBC. This move was meant to strengthen and restructure regional fisheries bodies.

What Others Have to Say about BOBP

The following comments are from (a) A report commissioned by SIDA and undertaken by SWEDMAR about the quality of BOBP's output (b) The FAO/Denmark/Japan Mid-Term Evaluation of the BOBP and (c) the 1999 FAO Mission to document the learnings and lessons of BOBP's Third Phase.

- BOBP is probably the best documented long-term fisheries project in the world (Andreasson and Funegard, 1997). According to Andreasson and Funegard (1997), an average 90% of the pilot projects yielded conclusive results.
- The Third Phase BOBP has been successful in raising the profile of a people-centred consultative approach to the management of fisheries and aquatic resources. Improved management is essential for maintaining the incomes of small-scale fisherfolk and protecting biodiversity (Markie, Hotta and Sen, 1997). Thus the Third Phase BOBP was addressing and meeting an important need of its member-countries, that is, the inclusion of the human dimension in management.

BOBP has had just about three and a half years to implement these activities, since the first 12 to 18 months of the Third Phase were spent in situation analysis and defining the BOBP's role during the Third Phase. A major lesson from BOBP is therefore that a five-year time-scale will not allow completion of a process as complex as management. A longer time horizon is needed.

- Member-countries were unanimous that a regional approach such as BOBP's is valuable in addressing coastal management issues. Advantages: easy access to specialised advice, active information dissemination, learning from the experiences of other countries. BOBP workshops enable personal contact among officials and experts of different countries. There is also a sense of pride from partnership with an international programme. Member-countries were unanimous that the third phase should be continued in some way, expanded if possible.
- Member-countries have praised highly the advice, inputs and technical support provided by the Programme, but note that the small size and limited financial resources of BOBP limit the assistance the Programme can provide.
- Experience-sharing appears to have been more effective at the international level than the national level.
- A major problem has been the frequent transfer or promotion of officials trained by BOBP — the project loses their services. This has affected the implementation of BOBP-supported activities. The Programme's model of a stakeholder approach is steadily being pursued by member-countries.
- BOBP has had a strong impact on raising awareness about fisheries and coastal management issues. The creation of a core group of fishery officers at senior and middle levels in each country who are committed to improving fisheries management is one of BOBP's major achievements.

- Most countries spoke highly of the information activities, particularly the Newsletter, *Bay of Bengal News*, which was the main channel for information-sharing. Some of the Newsletter's articles had been translated into local languages. The Programme's posters were seen in many of the locations visited by the team. The consensus was that these too were useful in spreading management awareness. National counterparts attached great value to local-language materials whose production was supported by BOBP.
- BOBP's advocacy role was emphasised in a number of countries. Its endorsement of a fisheries management initiative lent it credibility in the eyes of both fisheries stakeholders and government decision-makers and facilitated approval by a central government or an international agency.
- To a greater degree, the success of the Programme's activities in member-countries can be attributed to the spirit of national execution and cost-sharing which instills greater work and financial discipline. It has shown that national execution can and does work.

Closing Remarks

BOBP does **not** directly manage fisheries. Only member-countries do so. Through various modalities — as a catalyst, facilitator and neutral coordinator — the Programme has been able to promote the processes required to sustainably manage fisheries and aquatic resources in member countries. BOBP's initiatives have focused on bringing together and involving all stakeholders in the management process — those within and without the fisheries. This has been achieved to a large measure in the pilot projects carried out and documented. In the final analysis, only the sustainable production, development and management of fisheries and aquatic resources can help to increase the purchasing power of the poor and thereby help to eradicate poverty and sustain the environment into the future.

Documentation of Learnings: India

by Dipankar Saha

The last issue of Bay of Bengal News summarised the findings of the recent two-member Mission that documented the learning of the BOBP's Third Phase. The article on these pages summarises the learnings relating to BOBP's activities in India, presented by national consultant.

Under the Third Phase of BOBP, activities in India were initiated in 1995 in Tamil Nadu (Kanniyakumari and Chennai districts). Andhra Pradesh (East Godavari, West Godavari & Krishna districts), Orissa (Baleswar and Cuttack Districts) and West Bengal (North 24 Parganas, South 24 Parganas & Midnapore Districts).

Following a survey and a workshop organised in co-operation with the Government of India and the State Governments, the Programme decided to focus on coastal fisheries management in Tamil Nadu and Orissa, and on aquaculture management in Andhra Pradesh and West Bengal.

A national consultant was assigned to extract the learnings from the Programme's work in India, in the light of the Programme's objectives. He visited all the four East Coast States during the months of May and June 1999. He met fisherfolk, Government officials at basic and senior levels, NGO representatives, and other stakeholders. His impressions and findings about BOBP work are summarised here.

Findings and Impressions, Tamil Nadu

1. Fisherfolk welcome diverse activities such as the setting up of artificial reefs promoted by BOBP. They would like the Programme to initiate a proposal to the Government to continue practical demonstrations on artificial reefs.
2. The BOBP-supported study on fishing intensity in Kanniyakumari district is considered useful by fisherfolk. The study yielded maps showing which groups fished where. Fisherfolk said the study used participatory tools to identify in detail the problems of coastal fisheries. It helped them comprehend the realities about fishing pressure. It made possible discussion and development of strategies to solve some of the problems highlighted.
3. The series of stakeholder consultations and meetings in Kanniyakumari district has helped ease tensions in relationships between the three groups of boat owners — *kattamurams*, *vallams* and motorised boats. Conflicts among the three have not been eliminated, fisherfolk say, but there is better understanding of one another's viewpoint.
4. Resource mapping in every village through application of Participatory Rural Appraisal (PRA) tools has shown the fisherfolk a quick low-cost method of obtaining information.
5. The fisherfolk want early action by the authorities on infrastructure needs they have identified and prioritised through a BOBP study. They want more frequent and regular contact with the Department of Fisheries (DOF) or BOBP staff or both.
6. Grassroots-level Government staff appreciate the PRA method they have learned. It has strengthened their knowledge, and their confidence about collecting information on coastal problems.
7. Junior Government staff say that implementing the stakeholders



approach and taking part in stakeholder consultations means heavy work outside office hours for which they are not compensated. A system of financial incentives is necessary to counter hardship and keep up morale.

8. They point out that allocation of funds for these activities is insufficient. They do not have official Government instructions or orders for the responsibilities they have to undertake. This hampers and slows work.
9. Delays in instructions from the headquarters to district offices have hampered implementation of BOBP work, officials say. There is no Government order on the basis of which funds can be spent by fisheries officials. Funds expected from Central Government sources for implementing BOBP-related work have not been forthcoming either. Delays in implementation are therefore inevitable.
10. Mr Hans Raj Verma, Director of Fisheries, says that BOBP work has tremendous techno-economic potential, but the implementation time is too short and unrealistic.
11. NGOs feel that BOBP activities should be implemented through a number of channels. They say the Programme's credibility is at stake if it relies heavily on Government to implement activities. BOBP should insist on policy changes on the basis of the surveys or studies it organises.
12. NGOs believe that BOBP's information materials would generate more impact if they were aimed at fisherfolk rather than officials, and if they were produced in the vernacular.
13. Former Government officials, some of whom facilitate project work, suggest the setting up of training centres for fisherfolk relating to the Code of Conduct for Responsible Fisheries, marketing operations, etc.

Findings and Impressions, Andhra Pradesh

1. Fisherfolk believe that their main problems are the Supreme Court's

order which imposes severe constraints on prawn culture, and the disease outbreaks in shrimp. They want concerted effort by the BOBP or the Government to rescue them.

2. The high work-poor payment syndrome has created unhappiness in Andhra Pradesh just as it has done in Tamil Nadu. The allowances that officials are paid for work relating to stakeholder analysis, etc. are considered insufficient.
3. Junior officials believe that BOBP-initiated training programmes concerning participatory analysis, stakeholder analysis and farming systems research have strengthened their knowledge base.
4. Junior government staff who took part in stakeholder consultations say that they together identified three solutions to the present problems with prawn culture – forming clusters of farmers to modify and improve the water drainage system; culture of alternative species (crabs for example) and of different prawn species (such as *Penaeus indicus*); and waste treatment to reduce environmental hazards and improve management. The staff had outlined a project proposal based on these suggestions. They would like early action on a project incorporating these steps.
5. The BOBP had provided a water-quality testing kit for experimental purposes to small-scale prawn culturists in Mattapalam near Kakinada (East Godavari district). Senior Government officials say that at least three more kits should have been made available for experimental purposes – one more in East Godavari, two in West Godavari and Krishna districts.
6. Junior Government officials say that NGOs are complicating the problems of prawn culture by dabbling in technical matters though they lack technical expertise. The NGOs should stick to social issues, which is where their strength lies.
7. Senior Government staff say the training on PRA and stakeholder analysis given to junior staff has been very useful. It has brought them closer to the target group and led to better understanding of the technical

and social problems of target groups. The senior staff now get stronger inputs and assistance from the junior staff.

8. The training imparted has not merely facilitated BOBP-related work. It has also eased implementation of other fisheries projects because of the closer interaction and rapport established between the Department of Fisheries and fisherfolk.
9. On the basis of the exercises in stakeholder consultations and analysis, and farming systems analysis, the Department of Fisheries has published useful leaflets in Telugu on (i) Package of practices on shrimp farming (ii) Identification of quality seeds and (iii) Identification of diseases and their prevention.

Says Mr O. Bhavanishankar, Additional Director: "Earlier, such leaflets were written in an office and did not reflect happenings on the ground. But these leaflets are based on field trips and inquiries and incorporate feedback from the field

Prawn farmers are happy with them."

10. Most Government staff trained by BOBP have been retained at their work stations and not transferred. This has facilitated smooth implementation.
11. There has been a communication problem about matching funds from the Centre for State Government activities on prawn culture. The Centre says the DOF should tap Integrated Rural Development Programme (IRDP) and Brackish-water Fisheries Development Agency (BFDA) funds for the purpose. However, at the state level, the absence of a GO specifically authorising BFDA to divert funds meant for brackishwater fisheries to stakeholder consultations is a handicap. In future, a GO from the Secretary of Fisheries authorising such expenditures should be organised to facilitate action.
12. Following the participatory exercises on farming systems analysis, the Department of Fisheries is trying to develop and demonstrate better management practices for shrimp farmers.

13. The DOF seeks to improve existing shrimp culture operations by measures such as low stocking density, supplementary pelleted feed and biotic agents to improve bottom soil. The DOF believes that such measures will reduce to some extent the problem of disease outbreaks in shrimp.
14. Senior government officials feel strongly that BOBP should continue for a few more years and promote solutions to shrimp culture problems based on experiences from elsewhere. They would like to see a new phase of BOBP from 2000 A.D.

Findings and Impressions, Orissa

As in other states, senior officials in Orissa are not conversant about the distinction between the earlier phases of BOBP and the present phase. They recall the Programme's work in earlier years – relating to training of extension officers, bank credit for fisherfolk, beach landing craft, non-formal education for fisherfolk children.

2. They do not know why Baleswar was selected for implementation of BOBP activity instead of Ganjam where the Programme is better known.
3. They do not know why BOBP's work in their State was discontinued during the latter part of the Third Phase.

4. They agree that the BOBP's training programmes strengthened their knowledge, but unfortunately most of the trained officers were transferred to other areas.
6. The Secretary of Fisheries says funds are the main constraint for implementation of coastal fisheries management programmes. The State's budget is limited, so Central funds are needed to carry out coastal fisheries management activities.

Findings and Impressions, West Bengal

1. Junior government officials say that the exercise of stakeholder analysis through PRA has strengthened their knowledge base. They are confident that they will be able to effectively use PRA as a tool to collect data on coastal aquaculture problems. They say that the Trainers Training Programme organised by BOBP has also helped them in their day-to-day work.
2. As in other States, they suggest some financial incentives for staff engaged in work on stakeholder consultations and analysis.
3. They point out that they have undertaken work without proper instructions or guidelines from their superiors and without adequate funds being allotted.

4. A three-tier *Panchayat* system is actively engaged in West Bengal in the implementation of all developmental projects. The DOF should familiarise the *panchayats* with BOBP work and involve them in its implementation.
5. The problem of transfer of officials trained by BOBP has not occurred in West Bengal. Most staff have been retained at their work stations.
6. The State Government has allocated a sum of Rs 5 lakhs for BOBP activities. In the absence of Central funds and proper guidelines, it could not do better.
7. A state-level NGO, the Ran*ishna Ashram Krishi Vigyan Kendra (RAKVK), has played a vital role in maintaining liaison between senior and junior officials and stakeholders of the three districts for better implementation of BOBP's activities. The personnel of the Kendra say that stakeholder analysis, the participatory approach and experiential learning have created great enthusiasm among grassroot-level government staff. Such capacity-building has not only helped them in their day-to-day activities, but also instilled confidence in them about tackling other problems.
8. Coordination between grassroots-level officials and senior officials needs to be strengthened. A full-time departmental officer with a scientific background ought to take up this responsibility on behalf of BOBP and the State Government.

The stakeholder consultations initiated by BOBP have helped ease tensions between owners of kattumarams, vallams and motorised boats.



Fisheries Development Commissioner to the Government of India

1. The Fisheries Development Commissioner regards BOBP's Third Phase as a tripartite effort to help introduce better fisheries management practices in the four East Coast States. The effort involves the BOBP, the Government of India and concerned State Governments. Each party plays a specific role: BOBP serves as think tank and resource manager, GOI as facilitator for the activities in each State in identified areas, the State



India's Fisheries Development Commissioner is unequivocal about the need for BOBP to continue its activities in India as an inter-governmental organisation. So that it plays its part in the better management of coastal communities.

Governments as agencies for programme implementation for the betterment of their states' coastal resources and fisherfolk.

2. The Fisheries Development Commissioner agrees that the overall achievements during this phase of implementation are quite satisfactory. However, considering the area of the four states – larger than some small countries – the effect is not immediately perceived.
3. The Fisheries Development Commissioner does not regard the overlap between the BOBP's different phases in the minds of some State fisheries officials as a matter for worry. Sometimes, technical programmes from one phase carry over to the next phase. So it is difficult to draw a line between one phase and another.
4. The country's vast size, and the diversity in culture and entrepreneurship levels has to be borne in mind while assessing the strengths and weaknesses of any national project.
5. He is unequivocal about the need for BOBP to continue its activities in India as an inter-governmental

organisation, so that it plays its part in the better management of coastal communities.

6. Considering the BOBP's limited manpower, it could engage national consultants in each state for effective management of the remainder of the Third Phase and ensure good results.

Learnings, India

1. A full-time officer may be necessary at BOBP to pursue and coordinate the subject of stakeholder consultations and analysis in the four East Coast States.
2. A manual on stakeholder analysis would be essential to help officials at all levels. It is understood that BOBP will publish such a manual shortly.
3. A mechanism should be worked out for smooth State-level implementation of the activities initiated by an international organisation such as BOBP. Area-specific plans should be drawn up with the full approval of the authorities concerned. These ought to enable prompt implementation of activities and timely

disbursement of funds wherever necessary.

4. States should get clear instructions and guidelines from the Centre on how States can tap and access funds to implement the activities of an organisation such as BOBP.
5. In some States (like West Bengal), district authorities like the *Panchayats* should be engaged by the DOF for successful implementation of BOBP project activities, since they have both the manpower and the funds.
6. Participatory Rural Appraisal (PRA) methods should be promoted and popularised for quick data collection.
7. Considering the Programme's achievements in strengthening the knowledge base of officials, extension of useful and viable technologies to end-users, and developing the fisheries data base at the State level, donors should consider a new phase of the BOBP to further strengthen coastal fisheries management in India and other countries around the Bay of Bengal.

Documentation of Learnings, Maldives

by Hassan Maniku

Introduction

To fully understand the linkages and experiences Maldives has had with the BOBP, it is important to briefly reflect on the Programme's past history.

Even though Maldives is the smallest partner in the Programme, it has played a major role in the evolution of the Programme, specially its third phase. Maldives officially joined the Programme only in 1988, during its second phase, but it has been receiving assistance from the BOBP since 1983.

The second phase of the BOBP focussed on developing extension services and aquaculture and on understanding the fishery resources. Maldives benefited extensively from this Phase in understanding its emerging reef fish fishery.

Highlights of Second Phase Activities:

1. Establishment of an Extension Unit within the Ministry of Fisheries and Agriculture, which at present is the Operations Section of the Ministry of Fisheries, Agriculture and Marine Resources.
2. Short-term training for a number of staff from the Extension Unit. Through BOBP collaboration, Maldives has been able to receive training annually from the SEAFDEC Training Center in Thailand. This is one of the activities that was sustained throughout the Third Phase of the BOBP as well.
3. Introduction of appropriate technologies, such as boat hauling devices.
4. Development of teaching materials for primary and secondary schools on resources utilisation and understanding. Development of a colouring book about the Reefs of the Maldives.
5. Preparation of a Handbook on Fisheries Data Collection, targeted at reef resources. This draft has been prepared and tested with the communities of Vaavu, Meemu, Faafu and Dhaalu as well. The Handbook is ready for introduction.
6. Understanding the Bio-Economics of Fish Aggregating Devices. A study was conducted to understand its impact.
7. A number of resources assessment surveys were conducted – on tunas, reef fish resources, giant clam fishery, sea cucumber fishery, and shark fishery. The findings and recommendations have been accepted by the government and used to develop management regulations.
8. The second phase of the BOBP culminated in the development of the Integrated Reef Resources Management (IRRM) Programme as a National Research Programme to assist the government in developing management options for the reef fishery resources.

The development of the IRRM Programme coincided very well with the aims and objectives of the Programme's Third Phase. Maldives was fortunate in that continuity was maintained in its BOBP activities.

Background

The Bay of Bengal Region is quite diverse in socio-political and cultural terms. It is unified only by similarities encountered due to the tropical fishery ecosystems, the presence of predominant small-scale fisherfolk communities and the diversity in the fish species caught.

Of the BOBP countries, Maldives is one country where the conditions are unique – the main fishery is for tuna and tuna-like species. Only recently has it started exploiting the coastal reef fishery resources. It is also only in the Maldives that the fishermen population is rising. This is due to the new resources that are being exploited; in other BOBP countries, the resources have largely been over-exploited.

The high pressure on resources in the Maldives was on account of the sharing of coastal resources with the growing tourism trade. The other major issue was the lack of well-defined policies, strategies and measures in the management of reef resources.

The other major threat to the resource is the degradation of the environment. Because of the recent economic trends in the Maldives, there has been an

The main fishery in the Maldives is for tuna and tuna-like species.



increase in coral mining for construction and buildings and loss of mangroves and nursery grounds due to reclamation and deepening of harbours.

Thus the Third Phase of the BOBP was opportune to consider these aspects in fishery resources management.

Objectives and Design

The development objective of BOBP's Phase III is sustainable development in coastal communities. This is the common objective of the participating countries. However, the mix of inputs to achieve the objectives varies from one country to another.

The four principal inputs were:

1. Fisheries management
2. Economic diversification
3. Infrastructure and social services
4. Environmental protection

For the Maldives, the main thrust was on reef resources management and environmental protection (inputs 1 and 4)

The immediate objective was: Increase awareness and knowledge of the needs, benefits and practices of fisheries management among institutions and people concerned at all levels and in all sectors of major relevance to marine fisheries and coastal fishing communities.

All the activities of the Programme were to be implemented through the national institutions in their respective countries responsible for fisheries management and related subjects. BOBP was to closely coordinate with the institutions and assist in any ongoing national efforts.

Considering the knowledge of the fishery resources obtained from the BOBP's second phase and execution of the integrated reef resources management component that emerged from the second phase, the objectives were very relevant to the needs of the sector and the country.

However, there was a need to restructure and improve the performance of the management section of the Ministry of Fisheries, Agriculture and Marine

Resources as well as relevant support institutions. The Ministry needed to be strengthened to enable it to prepare and implement fisheries management plans that were emerging through the IRRM process.

Thus, the first and the last principal inputs were not fully integrated with the government's management regime.

The second and the third principal inputs were not very relevant to the Maldives, as the whole IRRM Programme remained a research component throughout the programme.

The environmental aspect of the project was not taken up fully, because there was a separate Ministry concerned with the environment, having its own agenda. However, during the first two years of the programme, marine environmental degradation and the impact of coral mining on the reef fish fishery were considered.

Implementation

As the National IRRMP was a coral reef ecosystem issue, rather than purely a fishery issue, the BOBP faced a major drawback during the last two years. The entire project, but for two technical inputs from BOBP, lacked qualified professional inputs. Thus, there were problems in coordinating research findings and incorporating them into the management decision-making process of the Ministry.

BOBP could not provide technical expertise in the relevant areas because of the Programme's funding limitations. Maldives lacked formal funding for IRRMP both from government and outside donors. This was another drawback BOBP faced in executing its activity in the Maldives.

The technical assistance received by Maldives during the first two years of the programme culminated in a very important national workshop, which provided a comprehensive set of recommendations on how to proceed with establishing the IRRMP in the project area (Vaavu, Meemu, Faafu and Dhaalu Atolls). It was also an important aspect to be considered that the Maldives Fisheries Advisory Board endorsed the workshop's recommendations.

Effect of External Factors

Phase III of the BOBP was initiated during 1994, at a time when globalisation was the rage in international finance. The UNCED process and Agenda 21 were just beginning to take shape. GEF had been born. Thus, international funding agencies as well as international consultancy services were in a state of reorganization.

Within the fisheries sector, the Code of Conduct for Responsible Fisheries and the Convention on Straddling Fish Stocks and Highly Migratory Fish Stocks was approved as well. These two international documents had a major impact on how to operationalise the management regime.

There was also a major thrust on stakeholder participation and NGO participation and a number of restructuring exercises, which the Programme was unable to address, mainly because of lack of technical staff.

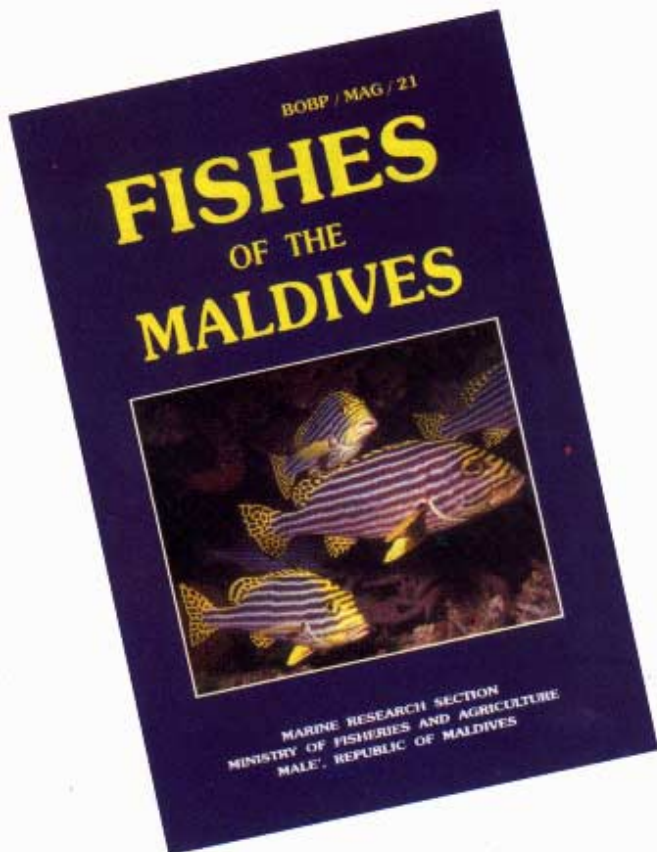
The objectives of the Third Phase of BOBP seem to have been overshadowed. Regional bodies needed to be restructured at the same time. BOBP seems to have been lagging behind in this process. Main reason: The Advisory Committee did not address these emerging issues.

Within the Maldives, there were a number of restructuring exercises, which led to a high turnover of senior policy-making staff within and outside the sector. Thus, the work carried out under IRRMP lost continuity.

The development of the International Coral Reef Initiative (ICRI) was another important milestone for the Maldives, as the entire IRRMP revolved around the guidelines of ICRI. BOBP was largely unable to follow-up the ICRI process.

Achievements

Considering the drawbacks, Maldives was able to achieve substantially the task of formulating the IRRMP. Inputs received from BOBP were meagre because of its staff limitations. However, BOBP was able to organise a number of useful training workshops at the regional



BOBP supported the publication of a 410-page book on "Fishes of the Maldives" in English and Divehi.

level. The Programme did assist in developing and creating awareness among a broad range of stakeholders, from schools, island communities and industry, as well as government organisations. A large number of publications and posters were produced. These helped to popularize environmental aspects and the concept of stakeholders participation. Highlighting traditional management systems and their role in developing management strategies was also an important contribution of the Programme.

Performance of the Government of Maldives

Except for the staff and island communities of Vaava, Meemu and the Marine Research Centre, the commitment received from other concerned institutions was low. This was a major drawback in integrating the findings of the IRRM into the development of a strong legal management system.

An institution concerned that did not meet expectations was the economic planning and coordination section of the Ministry of Fisheries. The Ministry lacked personnel to support the emerging management structure, especially at the senior level.

The other major drawback was the high turnover of staff in related institutions.

Except the staff directly involved in BOBP through the Marine Research Center, all the other staff are new. Thus, it has been extremely difficult to sustain continuity.

The other main concern was the lack of a project coordination committee that could oversee the work carried out by BOBP within the country. This was a major drawback in enabling the government to fully benefit from the programme.

Performance of the BOBP

The BOBP's performance was satisfactory. Though the Programme hardly had any technical staff, they have been very helpful. The national project staff and other officials have appreciated their positive attitude. The only shortcoming in the entire project process was lack of technical support from FAO and other relevant organisations.

The Advisory Committee (AC) shares the responsibility for this state of affairs. The Annual AC Meetings have not played their part in strengthening the BOBP as they had done in the past. The AC plays a major role in restructuring as well as in providing guidance to the Programme as a whole.

Lack of co-sponsors was another major drawback in fully benefiting from a regional process such as the BOBP.

Lessons Learned

There is today a greater appreciation of the need for better coordination and consultation in government circles, NGOs, fishing communities and other stakeholders. Some of the drive and impetus for collaboration has come through the effort of BOBP.

The Third Phase relies on national execution of Programme activities, with BOBP playing a catalytic role. This new thrust on national execution has not been fully achieved because of lack of member-country participation in the design process.

Member participation could have been strengthened through TCDC. This would have enabled the process of self-management of a regional body. While the Third Phase of BOBP is coming to an end, the Programme has not been able to draw substantive conclusions as to how a fourth phase if ever will be developed and integrated. This is largely due to lack of inter-country consultations.

If the BOBP is to continue, there must be inter-country consultations, which will assist in the understanding of certain commonalities. Such consultation would require a forum such as BOBP, or a clearing house where such support could be obtained.

Any new Regional Programme of this nature would require very active participation from member-countries in the whole process of managing the Programme, and closer links among participating member-countries, in order to comprehend and tap the pool of expertise and knowledge that is available in the region.

A Regional programme should not be a burden on member-countries but a catalyst and facilitator for further co-operation among them. It should establish mechanisms that would assist in the sharing of expertise within the region.

Future programmes of this nature should win strong support from donor agencies. The proposed GEF project ought to consider some of the views and inputs suggested above before a full-fledged inter-governmental organisation emerges from the experiences of the BOBP.

Regional Expert Consultation on Cleaner Fisheries Harbours Urges Action by Governments

by J A Sciortino

An FAO ports consultant summarises the presentations, discussions and recommendations of a four-day regional consultation on cleaner fisheries harbours organised in Chennai by BOBP and FAO.

The BOBP has since 1985 been promoting cleaner fishery harbours in the region with support from the IMO. It has conducted pilot activities in India, Thailand, the Maldives and Sri Lanka, focusing on awareness-building amongst stakeholders about overcoming pollution in fishery harbours and landing sites.

The key concerns in most fishing harbours and landing sites relate to supply of safe freshwater, sanitation, the collection and disposal of wastes, and the post-harvest handling of fish until it reaches local or export markets. The recent EU ban on fish and shrimp imports from at least three BOBP member countries, attributed specifically to lack of cleanliness and poor environmental conditions, has dealt a serious blow to trade in fish, and could affect the livelihood of millions of fisherfolk.

In the light of the above, the BOBP and the FAO organised a regional expert consultation on cleaner fishery harbours and seafood quality assurance in Chennai, India, from 25 to 28 October 1999. The meeting brought together fishery harbour managers and administrators, fish quality assurance professionals/administrators and harbour design engineers from the seven member-countries of BOBP (Bangladesh, India, Indonesia, Malaysia, the Maldives, Sri Lanka and Thailand).

Dr Kee-Chai Chong, Programme Coordinator of BOBP, inaugurated the consultation. He stressed that fish and seafood must be handled with great care, as food, not like any other commodity or raw material over which sanitation in handling is overlooked and compromised. Consultants J. Sciortino

and S Subasinghe highlighted appropriate technologies and approaches and strove to facilitate exchange of know-how and expertise.

The meeting hinged around five major contributions by the consultants — three on fishing harbour infrastructure, two on post-harvest handling and quality assurance. The topics:

- Needs assessment in fishing port design;
- Infrastructural design specifications;
- Fishery harbour management, the port management body, sanitation and waste management;
- Seafood quality assurance in small-scale fisheries and the role of cleaner harbours;
- Handling and storing fish onboard fishing craft and in fishery harbours;
- Status and development of fishery harbours in India.

Mr Rathin Roy of BOBP gave a good presentation on communication skills and the need for a more decisive stakeholders approach to some of the problems afflicting the industry.

The first two days of the meeting were devoted to technical presentations and discussions. The third day saw a practical exercise in rehabilitation of an existing facility, consisting of a visit to Chennai fishing harbour, followed by a “design clinic”. The fourth day was used to draw up a set of conclusions to be condensed into the Chennai Declaration (see pages 3 - 4), which the delegations hoped to present to policy-makers back home. A set of recommendations was also adopted.

Technical Contributions

The technical papers presented at the meeting drew wide acceptance. The contribution on Needs Assessment typically raised the need to take the Code of Conduct for Responsible Fisheries and the technical annexes more seriously. In particular:

- * The need to match the size of harbour facilities to the known resources;
- * The importance of ensuring environmental compatibility when fisheries facilities are being planned or upgraded;
- * The importance of supply of clean water with any fish landing facility;
- * That sanitation without some type of water supply (clean fresh or sea water) is not possible.

The paper on Infrastructural Design Specifications highlighted the typical problems facing cash-strapped administrations who have to pay for much-needed maintenance. Those present agreed that unless life-cycle costing of infrastructure is taken into account at the construction and tendering stage, least-cost methods of procurement have the capacity to bring a fishing harbour to its knees. The typical items of infrastructure, which everybody agreed needed better specification, are:

- * Water supply systems and plumbing in general;
- * Auction hall floors and drainage.

The paper on Fishery Harbour Management laid bare current shortcomings in harbour management. Of particular importance with harbour management bodies, where they exist, is

that these must be manned by the right people who understand the fishermen's needs. Feedback from stakeholders, enforcement of regulations, waste management, good housekeeping and sanitation all depend on good management practices.

The paper on Fish Quality Assurance highlighted the plight of countries affected by the EU ban and the role that cleaner harbours can play in ensuring that fish landed in these countries does not get contaminated.

Fishing harbours, though not strictly classed as processing facilities, have a lot in common with food processing plants in that they produce food for consumers when fish is auctioned off for the local markets. The HACCP concept used in food processing plants can be emulated at the harbour facility to provide a management tool with which to combat contamination.

The paper on Post-Harvest Handling presented the delegates with an excellent little video clip produced in the South

Pacific region, dealing particularly with the low-volume, high-value end of the artisanal sector.

The Indian paper on the current status of fishing ports in India presented an overview of the Indian fishing effort. However, as some delegates pointed out, there does not seem to be a connection between the proven resources and the entry of new vessels into the fishing effort (the construction of the new finger piers at Chennai appears to have strengthened the local fleet considerably, concentrating too much fishing effort in one area). This matter was discussed in great detail during the follow-up sessions on the third day.

BOBP and the Future

With the approach of the new millennium, BOBP enters a new and challenging era, partly because existing funding arrangements have ended, partly because of the growing need for more work in this field as soon as fish-importing countries start implementing the risk assessment approach to fisheries.

During the course of these discussions, the author said that the vast amount of information and goodwill BOBP has created cannot be let to gather dust on a shelf when so much still needs to be done, and when local consumer demand for good-quality fish is rising fast. The proposed Global Environment Facility (GEF) project that will succeed BOBP, and the prospect of turning BOBP into an Inter-Government Organization (IGO), was also discussed.

In conclusion, the author, together with the coordinating team, suggested that the Member-Countries themselves show the way forward by putting into practice the lessons learned at this meeting.

It was proposed that each country choose one facility to upgrade to the required standards and then use it as a living laboratory for Department of Fisheries staff, management bodies, consultants and designers.

The Consultation passed the Chennai Declaration (see page 4).

Participants to the consultation on cleaner fisheries harbours made a field trip to the Chennai fishing harbour.



Evolving a Self-Financing Regional Body to Manage the Bay of Bengal Large Marine Ecosystem

by Kee-Chai CHONG

When spiders unite, they can tie down a lion
Ethiopian Proverb

Managing the Large Marine Ecosystem of the Bay of Bengal entails both national and transboundary responsibilities. An (LME) project can build on the foundation laid by BOBP in tapping opportunities for inter-country co-operation, says the author. He outlines options for a self-financing regional mechanism for managing the LME and advocates a regional consultation to work out the mechanism.

Poverty is endemic in the Bay of Bengal region. It cannot be banished in the short term. But lack of access to food, water and air should be addressed immediately and not allowed to get out of hand. Our human and environmental insecurity is largely self-inflicted — it's our activities that have degraded the environment. By managing and regulating our own activities, we will lessen our individual and collective vulnerability to environmental changes from natural causes that are beyond our control or influence.

BOB Large Marine Ecosystem

The Bay of Bengal (BOB) is one of the world's 49 Large Marine Ecosystems (LME). The Bay is relatively shallow, especially in the north or upper reaches of the LME. Because it is shallow, ocean and sea current exchange is minimal in

the LME and adjacent seas. The hydrology, hydrography, bathymetry and trophodynamics of the Bay, and therefore its productivity and biodiversity, are heavily influenced by the continent's major river and estuarine systems — the Ganges-Brahmaputra-Meghna riverine network and to a lesser extent, other rivers such as the Mahanadi, Godavari, Krishna, Cauvery and Irrawaddy.

The waters of the Bay are not as saline as those of other bays, due to the spread of fresh/estuarine water far into the sea. As a result, certain coastal marine species are not commonly found in the Bay — clupeids, for example. But zooplankton, fish eggs and larvae of other commercial species are found to be abundant.

The total length of the coastline of the countries straddling the Bay and its adjacent seas is about 105,000 km

(excluding Myanmar's coastline). The Bay of Bengal is a relatively productive fishing zone of the Eastern Indian Ocean (FAO Statistical Area 57). Small-scale fisheries is practised in waters up to 10 m depth, while most marine fisheries are found in waters up to 10-50 m depth. More than 300 fish species are estimated to be of commercial value in the Bay's LME.

Small-scale fisheries operators in the Bay are still largely traditional. In many coastal areas of the Bay and adjacent seas, fish are still landed on open beaches, as fish landing centres or fish harbours are few and not conveniently located for many small-scale fisherfolk. Many of these fish harbours are unsuitable for small-scale fishing craft. Given the small size of fishing boats and the height of the harbours' docks, piers, jetties or quays, the boats cannot make use of the available facilities in



Pic. E. Amalore

these fish harbours. There is a mismatch between facilities and users. Private jetties are therefore quite common in the region.

On-shore management of the fishing crew and craft before they leave for fishing or after they return is impractical because the fish are landed all along the coast and not at the fish landing site or harbour provided. Fisheries management does not have to be carried out at sea, it can be done while the crew is on shore. If such management can be done on shore, management will be less costly and probably more effective,

Importance of Fisheries

Fisheries contributes between 0.2 % and 2 % of the national gross domestic product (GDP) in the countries around the Bay of Bengal. But what fisheries

does for national nutrition, health and survival is even more significant. Fish is a source of much-needed animal protein for coastal populations, as well as a source of livelihood and jobs.

Yet, joblessness and food insecurity among coastal populations remain high. Since they are unskilled and lack formal education, they have little to offer other than manual labour. Industries are confined to urban centres, partly due to Government policies. Prospects for jobs in agriculture are limited — it is small-scale in nature. So the opportunity cost of labour among coastal populations is very low,

Need for Regional Management

Except for a limited or piecemeal approach to resource management by countries within their own waters, there

is at present no effort to manage the Bay's LME on a regional basis. Such efforts, if any, are undertaken individually and independently within the country's own territorial/EEZ waters by the coastal states bordering the Bay.

Bounded by India and Sri Lanka to the west, Bangladesh to the north, and Myanmar, Thailand, Malaysia and Indonesia to the east, the BOB's LME covers an area of 2,215,000 km². More than a quarter of the world's population is found in the Bay of Bengal countries. The BOB's LME supports some 6-8 million fish harvesters directly, and more than 35-40 million others indirectly. Fifty per cent of the total catch of the Indian Ocean fisheries, or 3.45 million tons in 1993 is caught from the Bay LME. India, Thailand, Myanmar, Indonesia, Malaysia

and Bangladesh accounted for 95.6 % of the 3.45 million tons of fish landed in the Eastern Indian Ocean (Statistical

Problems and Concerns Relating to Coastal and Marine Fisheries Development and Management in the Bay of Bengal Region

[An Annex to the Report of the 24th Meeting of the Advisory Committee of the Bay of Bengal Programme]

Over-fishing of stocks is increasingly becoming visible, indicated by declining catch-per-unit-effort, reduction in average size of species, changes in catch composition and increasing levels of landing of trash fish.

2. Conflicts between commercial fishers and small-scale fishers and amongst small-scale fishers are on the increase.
3. Destructive practices of fishing, which excessively target juveniles or gravid females and are non-selective, are on the increase and not only affect fishery resources but also, more importantly, damage habitats.
4. There is concern about excess capacity in fisheries, resulting in economic hardship amongst fishers and undermining the economic viability of fisheries.
5. Excessive fishing effort, destructive forms of fishing, land reclamation and a variety of coastal activities are degrading and reducing the areas of rich biodiversity, spawning and breeding grounds such as estuaries, coral reefs, sea-grass beds, mangroves and lagoons.
6. Several of the more important and detrimental impacts on aquatic resources and habitats result from other sectors which are beyond the purview, control and jurisdiction of fishery agencies.
7. Tourism, and even eco-tourism, is poorly managed and the detrimental effect on aquatic environments from this sector is increasing.
8. Coastal and marine eco-systems are being increasingly affected by industrial effluents, sewage from human habitations and coastal activities.
9. Stakeholders and the public are generally not aware of conservation and resource sustainability issues, resulting in actions that are detrimental to the coastal and marine environment.
10. Rational management of coastal and marine resources and habitats is severely hampered by conflicts of interest arising out of highly specialized and compartmentalized administration by a large number of mostly un-coordinated agencies, with varied and often overlapping interests and objectives.
11. Non-tariff trade barriers are increasingly being applied to fish and the fish-product trade, resulting in lowered earnings and unfair trade relations.
12. Approaches, methods and techniques are often inadequately developed to address the needs of:
 - Rehabilitation of natural resources and habitats;
 - Monitoring, EIA and risk assessment of coastal aquaculture and mariculture;
 - Management of aquatic protected areas and sensitive specialised habitats;
 - Development and management of environment-friendly coastal eco-tourism;

- Prevention and control of pollution and contamination of conservation areas and protected areas.

13. Lack of availability of sound, timely and reliable information on aquatic resources, their habitats and utilisation affects the quality of decision-making in management.
14. Fisheries and related policy is often not geared to give direction to actions and address new and emerging concerns and requirements of:
 - Coastal, particularly small-scale marine resources management;
 - Management of coastal aquaculture, particularly shrimp farming;
 - Management and sustainable utilisation of mangroves;
 - Rational classification of coastal areas for conservation, fisheries and other uses;
 - Management of marine fisheries;
 - Management of mariculture.
15. Fisheries and related legislation has not kept pace with developments and are often not geared to support, regulate and give direction to new and emerging activities relating to:
 - Management of coastal and marine fisheries;
 - Management of coastal aquaculture, mariculture and mangroves;
 - Conservation and sustainable utilization of critical aquatic habitats;
 - Practical enforcement procedures to promote compliance;
 - Prevention and control of pollution from land and sea-based sources of coastal and marine ecosystems.
16. Poorly developed marketing channels for fish and fish products result in wastage and fishers receiving unfair prices.
17. Poor quality assurance of fish and fish products, especially in the large unorganized small-scale sector, may jeopardize earnings of fishers and trade in the region.
18. Fishery agencies, while often well equipped in terms of technical expertise, often have inadequate capacity to address the increasingly multi-disciplinary and complex issues they face. Rational and long-term human resource development is a neglected area in most fishery agencies.
19. While several excellent fisheries research and training institutions exist in the region, their distribution is uneven.
20. Mechanisms to promote sharing of knowledge and experience and to collectively understand and address common and shared problems are inadequate and often inaccessible.

Area 57) in 1993. Sri Lanka and the Maldives are in Statistical Area 51 (see Figure).

There is today growing recognition of environmental problems of a transboundary nature. The nature of the BOB's LME is such that there are and will be both national and transboundary responsibilities and functions in its management and conservation for sustainability. Building on the foundation already put in place by the 20-year old BOBP, the LME presents excellent cross-border and trans-frontier opportunities for co-operation and joint management action. Establishing a regional approach to transboundary issues and problems is a policy and institutional necessity whose time has come because of the increasing threat of unsustainability. (See box on page 22).

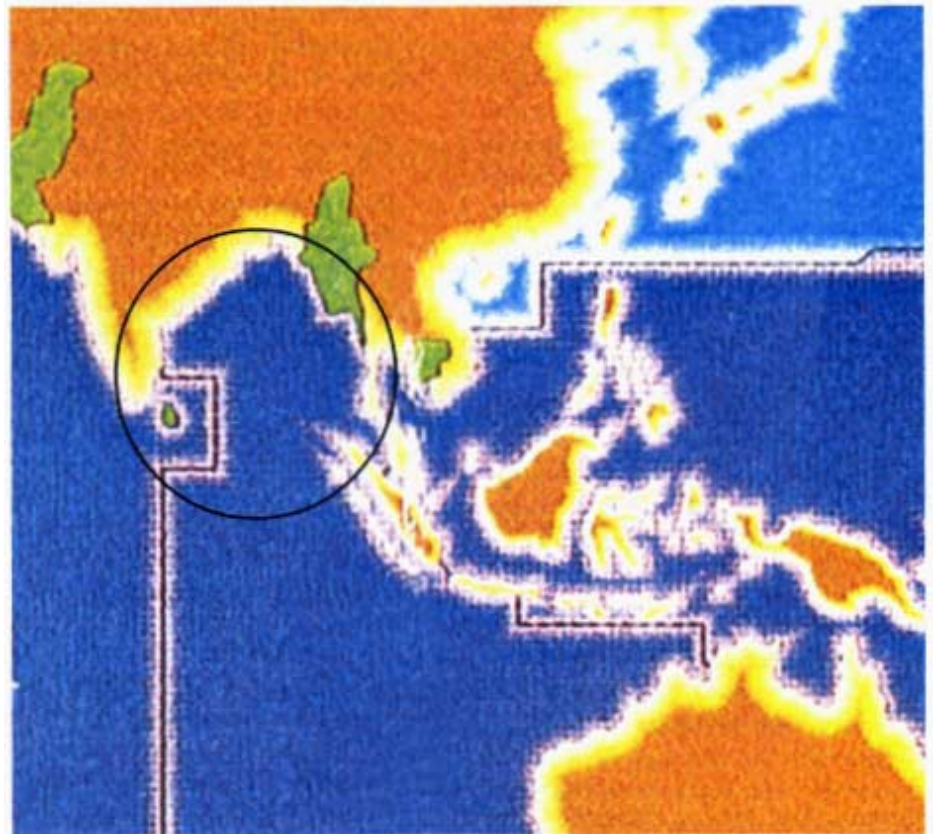
Resource management is a long-term commitment and investment. To succeed, it takes time, especially if the management style changes from a techno-bureaucratic government system within the borders of each country to a consultative and participative regional system. Within the Bay, there are already well-demarcated land and maritime boundaries duly acknowledged by the Bay's coastal states. In other words, there is no territorial dispute which can become taxing when a regional mechanism is to evolve for managing the Bay's resources and ecosystem.

Threats

The BOB's LME is under increasing threat from various sources — both human-induced and natural. The causes in most cases are anthropogenic.

excessive siltation and sedimentation from extensive and large upland riverine basins and catchment areas, due to extensive deforestation and land remodeling, human settlement, industrial development, dam construction etc.

- excessive run-offs from agriculture and ship-breaking, resulting in excessive inorganic and organic nutrient or heavy metal nutrient overloading
- incessant dumping of solid and liquid waste, oily waste and garbage



The Bay of Bengal Large Marine Ecosystem.

from urban litter into the waters of the Bay.

- coastal construction and land remodelling — port construction, resort construction, and tourist facilities development, not to mention sand mining.
- excessive untreated industrial and municipal discharge of pollutants, sludge and sewage respectively — sewage in particular, as it is still the single largest source of coastal pollution.
- growing eutrophication of coastal waters, posing immediate risks to humans (e.g. beaches unsafe for recreational use).
- sea bed destruction/impairment not only from trawling but from organic sediment loading and debris or junk.

Many of these pollution sources are from beyond their points of origin. As a result, the natural biological and ecological processes are hampered, if not distorted. The upshot is that the water condition and water quality in the Bay decline, as water pH turns acidic. This is especially so in nearshore and estuarine waters. Globalisation and international shipping are further degrading water

quality and the marine ecosystem through ballast water discharge, and the introduction of exotic species which could be detrimental to species endemic to the Bay's LME (see article on pages 28-31). Further, exotic organisms brought in from the fouling of fishing nets and gear that occurs in waters overseas is another risk factor. Oil spills are another hazard. The Bay water is further jeopardised and impaired by inorganic waste loads — heavy metals such as copper, zinc and cadmium.

Of all the world's major seas or oceans, it appears that it is the Indian Ocean, including the Bay of Bengal, where fisheries resources may not have completely succumbed to overfishing. In fact, these waters still yield good catches. The sizes of fish landed are still relatively large. Yields are still being maintained. Experience shows that fisheries sustainability and the conditions of the habitats are sensitive and respond to management. Ecosystem management aims at sustainable human use of resources — as long as ecological processes are maintained.

LME Approach to Management

The concept of the LME fits into the need to develop a regional ecological management framework. The manage-

ment of the Bay's LME should be ecological rather than biological as conventionally practised – e.g. fisheries management dominated as it were by fisheries biology, with emphasis on life cycles and life history. Ecology encompasses not only the fisheries and aquatic resources along with their habitats and ecosystems, but more importantly, human ecology and its relationships with the ecosystem, including the intricate balance between yield and carrying capacity. Implied in this assertion on ecological rather than biological focus is the human capacity for management, unlike other living species on this planet, which are incapable of managing their use.

The demarcation of geo-political boundaries would strengthen the regional role and responsibility to start to protect and manage the Bay's resources. The work undertaken by BOBP thus far has shown that there is an urgent need to respond to the pressing problems of transboundary issues in fisheries and aquatic resources management, especially those that straddle national jurisdictions. It is no longer sufficient to just manage resources and ecosystems within a country's borders. Joint management on a trans-frontier basis is needed.

In closing, fisheries and aquatic resources management, to be effective, require intervention and action not only at the local and national levels but also at the regional level. It is thus important for the Bay's coastal states to come together. If agreement can be reached to work together there are clear and real benefits to be gained by all.

Self-Financing of Regional Management

With governments forever severely short of funds, fisheries and aquatic resources management has to pay for itself. Self-financing regional management of the BOB's LME is a concept whose time has come and is worthy of in-depth consultation.

Some Funding or Cost-Cutting Options

- The trade in fish is soaring. Industry must share some of its profits to

finance the costs of management. The rubber industry in Malaysia does so, through two types of cess (see *Bay of Bengal News*, June 1998).

- Management and enforcement costs must be trimmed. The existing fisheries enforcement work force must be utilised better. On-shore management of fishing effort must and can be stepped up to cut the cost of expensive air and sea surveillance.

A management trust fund could be created with contributions from governments, industry, banks, endowments, international agencies, etc.

- Governments must delegate management responsibility and authority through stakeholder-participatory community-based fisheries management (CBFM). CBFM is presently practised mainly for nearshore and coastal waters. The community helps ensure compliance with management measures.
- As for offshore patrolling, a good part of it can be done efficiently onshore. All it takes is visits by enforcement officers to fishing harbour jetties for random inspection and awareness-building to educate them about the need for management and the benefits from it.
- A system of collection of royalties on catch landed, based in part on the 1954 classical Scott Gordon model on fisheries.
- Product promotion to generate funds, e.g. telephone cards, credit cards etc.
- Reduction of excess fishing capacity at the local, district, state and national levels through licensing, and limited entry or non-renewal of fishing licences.
- Attracting fishing boats and fisherfolk out of fisheries through alternative or supplemental employment opportunities.
- A user fee, as also an environmental cess system must be carefully explored and introduced. People's willingness to pay for essential

services is often under-estimated. Similarly, a polluter pays principle can be instituted.

- Fines must be levied for violations of fisheries management regulations. (In 1987, almost 50 % of the total fisheries revenues in Malaysia were derived from fines imposed on the use of illegal gears).
- Those who overfish, or inflict damage or destruction on the fisheries, its stock and habitats, must pay for the damage.
- Banks and other financial institutions may contribute to management by lending money against exports of seafood and grants or endowment.
- Certain management services such as sea patrolling or inspection of fishing vessels could be privatised.
- A regional or international consultation should be convened to help evolve a self-financing system for ecosystem management. Resource persons should work out in advance the economics and mechanics of various options, such as those cited above.

Concluding Remarks

Just as it has done for the last five billion years, the earth system will continue to evolve. Nature has withstood planetary strain and upheavals down the ages. Just as the human body calls for repair and maintenance to keep it going, the living earth also requires periodic repair and maintenance. Humans have inflicted the greatest damage to the environment on which our very survival depends. Human numbers must be moderated through population and family planning. Yield must be related to and balanced with human caring and Nature's carrying capacity.

The Bay's coastal states must seriously address these environmental threats through management. Left unmanaged, they will alter the future use of the LME resources – not least the fish yield from the Bay's waters which the teeming population takes for granted. The BOBP must press on with its work in promoting better management of the Bay's resources and ecosystem, not only within the national jurisdiction but beyond – in the LME.

Bay of Bengal Programme: A Farewell and a Beginning

by Venkatesh Salagrama

The author, who has been involved with BOBP work in various ways over the years, says that BOBP's outstanding achievement is its emphasis on people – involving them as partners in research and development, empowering them to accept or reject any new intervention. "BOBP may not be the only four-letter word that many fishers on India's east coast know, but it is certainly one of the better known."

As the Bay of Bengal Programme (BOBP) comes to a close shortly, one is tempted to become rather sentimental and nostalgic about 'the good old BOBP' and start meandering down memory lanes. But the sobering fact that it leaves behind – self-confessedly – no more than 'a foot print in the region', makes it necessary to assess the role it has played over the last two decades and what its closure means to the fisheries development in general and small-scale fisherfolk development in particular. It is perhaps not for someone who has been a part of the organisation for most of his career to assess the work done by it, but my association with BOBP spans a range of relationships, which, hopefully, gives me the freedom to talk about it. Much of what I say comes from my knowledge of BOBP's work on the east coast of India and certainly, this attempt will be coloured by a tinge of sentimentality with the colouring done in broad brush strokes to satisfy the requirements of a short article. And, it is possible that there are many people who will take issue with my paean to the BOBP.

A few lines of autobiography, I hope, may not be out of place, because I was a **BOBP** child. I grew up listening to the valorous exploits of the BOBP 'consultants' (the first time I ever heard of the tribe) with names which were mostly unpronounceable, but who were as vivid as (and more real than) Superman, Spiderman or Hanuman to a growing boy. They had a certain flamboyance which I realise now reflected imagination rather than reality, because the people I did meet after joining the BOBP were anything **but** flamboyant. **But the stories that were told of their exploits became legendary, and continue to remain so in many areas.** If you went to a fishing village like Uppada in Andhra

Pradesh or Pentakota in Orissa, chances are that you would be told countless anecdotes about BOBP, which makes you begin to wonder whether they were not making the stories up – 'mythologising', as it were. The mystery deepens when you consider that the BOBP never had a regular office either in Andhra Pradesh or in Orissa, nor any staffer who spoke either Telugu or Oriya.

When it came to choosing a profession, I certainly had no second thoughts. Looking back, I do not think I could have made a better decision, although working for the BOBP was not without its share of problems. You were expected to know everything under the sun – the mere fact of your association with the BOBP in whatever manner gave you a halo and

elevated you to the status of an 'expert' and whatever you said was given the attention that is generally reserved for saints. For the second-generation entrants like me, BOBP's pre-eminence was, at times, a millstone around the neck: a baggage that one was forced to carry everywhere.

Having said that, I must admit that it was an exhilarating experience. It was the freedom that one was given in developing an idea into a concrete action that made it possible to achieve results. It was the fact that one was constantly 'in the field', testing out new ideas, concepts, approaches, and, yes, new technologies, with people who matter – the fisherfolk and the agencies that work with them – that gave the activities a



coherence, a meaning and an existence. It was the constant give-and-take, learn-and-teach, listen-and-speak that provided fodder to the thought grinders. And it was the ennobling feeling of having shared what little you know with someone who needed it that made you feel proud. And I am sure it is the same pride that ignited those hundreds of extension people all along the East Coast of India to take their work and their association with the BOBP so seriously, that accounts for their continued interest in its wellbeing.

If one were to attempt to sum up the work of the BOBP, what stands out most prominently? Notable as several BOBP activities were, it was the emphasis on people – involving them as partners in the research and development processes, allowing them to judge activities using their own criteria, empowering them to accept or reject any new intervention – which is an outstanding achievement of the BOBP. Its emphasis on small-scale fisheries development, at a time when development was equated with ‘hi-fi’ things like mechanisation and industrialisation was, as it turned out, a significant milestone in moulding and changing attitudes in the area of fisheries development. That some governmental development programmes targeting

small-scale fishing communities are still called ‘BOBP programmes’, long after BOBP withdrew from the activity, dramatises the emphasis that it placed on small-scale fisheries and fisherfolk, and the imprint it has left in the minds of people as an organisation for their development. BOBP may not be the only four-letter word in English that many fishers on the East Coast of India know, but it certainly is one of the better known.

That will be the enduring legacy of the BOBP: putting people first. People-centred approaches, participatory development, bottom-up planning and implementation strategies, sustainable livelihoods, responsible resource management, alternative income generating opportunities – **BOBP** was either prophetic or ahead of its time, but all these issues were an integral part of its work, much before they became development buzzwords. Only, the BOBP did not often seem to catch up with the current development jargon, which made it look old-fashioned.

Other outstanding features of BOBP’s work include : multi-disciplinary approaches to fisherfolk development, flexibility in project design and execution, and that most popular activity

by which most people know the organisation : information dissemination. The publications of the BOBP are what made it a household name in the fisheries sector. They were by no means exhaustive nor were they expected to be, but their popularity – particularly among the staff of the Department of Fisheries in many coastal states – is astounding. An almost imperceptible, but equally important, activity was the forging of vertical linkages within organisations, such as the Department of Fisheries. One need look no farther than the Orissa Marine Fisheries Extension Service to understand the high levels of motivation that the BOBP was able to instil among the staff, by merely allowing them to exercise their own minds, and ensuring that whatever they came up with was listened to and acted upon at the upper echelons.

Broadly, the BOBP is an example of what a small, well-motivated organisation (with few constraints by way of financial limitations, of course) could achieve in terms of effective fisherfolk development. Take a look at any craft and gear introduction, talk to any marine fisheries extension officer, or read any BOBP publication – and you will know what I mean. From fisheries development to fisherfolk development to fisheries management, the BOBP travelled a long way, and carried many others in its wake.

Someone recently asked me: “Could the impact of BOBP have been greater had it been done differently”? The Programme’s initial technology focus never quite faded away, but over the years a change in attitudes and approaches is very clear. The Programme was quite clearly interested in working mainly through the government organisation, although it did work with some NGOs in the later period, and this restricted the range of organisations which could have benefited from the Programme to some extent. To what extent the Programme has been able to change attitudes and approaches at an institutional level among the partner organisations is unclear, and this is a handicap that could have been avoided, had the range of partner organisations been broad enough.

My favourite grumble about the BOBP is that it often shied away from taking



credit where it was due. One could sense a kind of shame when someone 'admitted' to have been involved in the fishing craft development programmes. Agreed, increasing fish production is no longer a politically correct way of doing things, but it has to be seen in the context of its times. If the traditional fishermen in Andhra Pradesh or Orissa regard the **BOBP** highly, it is mainly for introducing fibreglass as a boat building material, and had it not been for the fibreglass technology, the communities would have fared much worse in the fight for survival. What this shying away meant was that valuable linkages that had grown between the organisation and the people, which could have been put to very effective use – such as promoting resource conservation measures – were not made use of. The sense of continuity is very important in a relationship, and this was, I feel, lost unnecessarily.

However, a more important question to ask now would be: "Could small-scale fisherfolk development have been different if there was no **BOBP**?" On the answer to this question would hinge another, even more pertinent question: "When **BOBP** does the vanishing trick, will the small-scale fishing communities lose anything?" I would not attempt to answer these questions because most people know what the answers are already, but with the closure of the **BOBP** imminent, the time has come to answer them in more concrete terms as the following discussion makes clear.

Why target small-scale marine fisherfolk? Why does the **BOBP** confine itself to small-scale fisheries, when it could spend its time, money and effort more profitably in other areas? This question might seem a bit dated now, but one which plagued me in the early 1990s wherever I went. Quite possibly, it was questions of this nature that led to the establishment of so many fisheries research institutes in the country, but not one to deal with small-scale fisheries development. From mid-1990's, most research institutions have at least shown an interest in undertaking more people-centred research, but the proceedings of the numerous workshops, seminars, symposia et. al., continue to show that the new interest in people-centred research and development was more wishful thinking than actual practice. That this 'trickle-down' approach has not

been very successful is generally accepted now.

Thanks to the 'developments' in the last two decades, newer areas of concern are cropping up more frequently than in the past. Issues related to declining biodiversity, the impact of increased marketability of fish on poor processors and consumers, lack of alternative sources of income, increasing need for capital for replacement of productive assets, widening social gap between the rich and the poor within the fishing communities, increased vulnerability to natural disasters as a result of deforestation and other causes, and marginalisation of traditional (indigenous) community-based knowledge and management systems, are some of the concerns that need deeper and more urgent understanding. Their impact on small-scale fisherfolk is particularly distressing, and the marginalisation of the more vulnerable among them is nearly complete.

Much of the ongoing development effort is still aimed at increasing harvests and meeting targets. When resource management is considered at all, the initiatives would take the form of bans and regulations, which are seldom enforceable. And in small-scale fisheries, a few standard 'welfare' programmes – which are often too inadequate anyway – are taken up rarely with a clear understanding of the communities' concerns, needs and opportunities. The more influential sections in the communities have mastered the rules of the game quite well, and a new elite has emerged in most villages which would do anything to protect the status quo.

That does not mean that all current development work targeting small-scale fishing communities is wasted. It might be true that whatever has been taking place often serves its purpose very well indeed, but not because of any clear understanding of issues on the part of the implementers. The main concern right now is that, after all these years of work, we still do not have much vital information about the fishing communities. There are grey patches in our knowledge of the people, their modes of thinking and their priorities. There is a huge gulf between 'us' and 'them',

which is bridged by sinuous linkages like the one that **BOBP** provided, and many NGOs are providing now, but these are at best efforts to cross the gulf rather than bridge the gap permanently. It is said that one can never fully understand a way of life which is different from one's own. The painful conclusion one often reaches after seeing huge infrastructural facilities put up by development agencies which are never used by the communities is that we have not understood the communities *at all*. This lack of understanding – empathy, if you will, because there is often more sympathy than is necessary with disastrous results – creates all the confusion and chaos that generally characterises any programmes concerning fisherfolk.

The example of the **BOBP** provides a model approach for fisheries development. It stresses that a multi-disciplinary, multi-sectoral, and multi-faceted organisation is absolutely essential to generate and disseminate knowledge about the small-scale fishing communities, and to experiment with new approaches and strategies for effective implementation of development programmes. For these twenty years, the **BOBP**'s own existence – albeit in the 'footprint' mode – served as an excuse for letting sleeping dogs lie, and understandably so, because it was a learning process that the **BOBP** embarked on, and whatever it learnt – both successes and failures – would be invaluable for a successor organisation to take into consideration. But it becomes a matter of urgency to start a 'Central Small-Scale Fisheries Research Institute' which will have experts from different disciplines in social sciences and natural sciences, from anthropology to zoology, micro-enterprise management to sustainable livelihoods. The organisation will be autonomous, open to everyone who is interested in development, continues to bring out newsletters and other publications, conducts dissemination campaigns, works closely with all organisations at all levels on all issues including credit, marketing, conservation, ecology and environment, and more than anything else, it will be **PEOPLE-CENTRED**. Just like the **BOBP**. And that will be the fitting tribute to the good old Bay of Bengal Programme.

Is any one listening?

Managing Problems Associated with Ballast Water Discharges in Malaysia

By Ainul Raihan Hj. Ahmad

Centrefor Coastal and Marine Environment, Maritime Institute of Malaysia

Harmful aquatic organisms can be introduced into the coastal and marine environment through the ballast water used to keep ships safe and stable. Australia, New Zealand and the US have promoted voluntary codes of conduct to reduce risks of this kind to the environment. This paper reviews the present status of ballast water discharge management in Malaysia. It also discusses theoretical concepts about the collection of baseline data to manage ballast water discharge.

Introduction

The introduction of aquatic organisms through ballast water can subject marine and freshwater ecosystems to serious risk, with economic repercussions. The infestation of zebra mussels in the Great Lakes of the United States, for example, altered the freshwater ecosystems of the US and caused major economic damage. It is estimated that by 2000 A.D., the US will be spending US\$5 billion to control an invasive mollusk.¹ It was introduced to the Great Lakes via ballast water taken from the freshwater of European ports.

The ballast water issue was first brought to public notice by Australia in the late 1980s after toxic dinoflagellates were discovered in Australian waters. In more recent years, the issue of ballast water has raised grave concern among the international community. A draft regulation for management of ballast water had been tabled for discussion by the working group of the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) during the 43rd MEPC meeting of June-July 1999. The form of this legally binding instrument is still pending for decision. The question is whether to consider the addition of ballast water as a new annex to the International Convention for the Prevention of Pollution From Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/78), to amend the

existing annex, or adopt an entirely new convention.²

Australia, New Zealand and the United States are among the countries that have been proactive in the ballast water issue. They have adopted a responsible approach by introducing a voluntary code of conduct to reduce the risks of invasion of harmful aquatic organisms via ballast water in their coastal and marine environment. Research, nevertheless, continues to intensify to find effective control measures.

This paper is based on a preliminary literature survey and discussion with relevant authorities. Its main objective is to review the present status of ballast water discharge management in Malaysia as well as to present theoretical concepts on collecting baseline data for the management of ballast water discharges. This will be based on the experiences of countries that are actively pursuing the matter and have expertise in the area. This paper intends to do so by addressing a number of questions related to the management or control of problems associated with ballast water discharge in Malaysia.

First, the paper will discuss the amount of research that has been carried out on the subject in Malaysia. Second, the paper will examine the level of awareness among responsible agencies of the potential impact ballast water discharges could have on Malaysia's

marine environment and the need to control such activities. Finally, the paper will suggest some pointers for initiating a programme to control ballast water discharges.

Ballast Water

Ballast water is used for the safety and stability of ships.³ It is important for maintaining adequate propeller depth, adjusting the ship's depth in the water and compensating for currents and wind forces. In general, there are three reasons why ballast is essential, depending on the vessel types. For tankers and dry bulk carriers, ballast water will be used in large quantities to make up for weight lost after unloading the cargo they carry. Ballast helps ships like ferry, military and fishing vessels to maneuver and facilitate control during loading conditions, provide stability, trim and heel. Ballast is also required for ships such as heavy lift vessels for loading and unloading operations.

The ballast water capacity of most ships is about 25 to 30 per cent of their dead weight tonnage. Normally, a vessel will carry 25 per cent load of ballast water of its full ballast capacity that ranges from 13,500 gallons of ballast water to 9.3 million gallons of water. The ballast intake will most likely increase if the trip is long and the weather condition is unfavourable.

Hayden, Barbara. 1995. Nature and Magnitude of the Problem *International Perspectives, New Zealand*.

This paper was presented during the National Ballast Water Symposium in Wellington, New Zealand in 1995.

2 Chew, Hillary. 1999. Technology Designed to Curb Harmful Migration of Marine Organisms:

System for Sterile Ballast, The Star: Maritime Section. August 1999.

Information in this section is mostly taken from the report of "Ballast Water Treatment Systems: A Feasibility Study" by Debra Greenman, Kevin Mullen, and Shardool Palmer, a project commissioned by the United States Coast Guard and Worcester Polytechnic Institute.

Introduction of Exotic Species through Ballast Water Discharges

How does the species of one country get introduced to another country through ballast water? When an international ship sails from a certain country with no cargo, the ship pumps in seawater to compensate the weight lost. Once it reaches its destination, the ballast is then discharged as the ship is loaded. Often, the ballast discharge will release foreign species from seawater taken from the port of departure of the vessel concerned.

The technical report done by Australia's Centre for Research on Introduced Marine Pests (CRIMP) suggested a number of parameters that will determine the degree of colonisation by the introduced species. Berths or relatively narrow shipping channels increase the probability of colonisation because the opportunities of dispersal are limited. Activities at ports may also enhance the success rate of colonisation because of alteration of the habitat or degradation, on account of which the natural community may be outnumbered by the invaders. The problem is further compounded as these exotic species are then spread domestically by coastal vessels.

Examples of Impact of Invading Species on Local Environments

The invaders that are introduced via ballast water discharge include marine pests/organisms and micro-organisms that have great potential for damaging the ecosystem. Most global extinction due to invasive species has always been associated with islands or aquatic ecosystems and not terrestrial or continental ecosystems.⁴ Thus, Article 196 of the United Nations Law of the Sea Convention acknowledges that necessary measures should be taken by all States to prevent, reduce and control either intentional or accidental introduction of alien or new species that may cause harmful or significant changes to the marine environment.⁵

There are many examples of the damage caused by bio-invasion or biological pollution of ballast water. One appalling example is the dominance of comb



Ballast water; loaded at a ship's port of origin to maintain the safety and stability of the ship, can introduce harmful aquatic organisms when discharged at the port of destination.

jelly in the Black Sea that eats the zooplankton, which is an important source of nourishment for fish. This has led to the crash of several marine fisheries in the Black Sea. The exotic phytoplankton from ship ballast water also poses threats to mariculture sites on Canada's East Coast. The black-striped mussels have caused fouling of wharves, marinas, recreational and inshore vessels, marine farms, and mariculture pumping facilities in Australia that cost million of dollars for remedial and infrastructure repair. Ballast water is also responsible for the spread of cholera which was found in the ballast water of vessels from South America entering the US.

Some very high-profile invaders, such as the Round Goby (*Neogobius melanostomus*), Zebra Mussel

(*Dreissena polymorpha*), Ruffee (*Gymnocephalus cernuus*) and Spiny Water Flea (*Bythotrephes cederstroemi*) are some of the identified exotic species of the Great Lakes that entered the area through ballast water discharges and are known to cause economic and environmental threats. The Round Goby, a bottom-dwelling fish, competes with native bottom-dwellers like sculpins and log perch. With its frequent spawning and its aggressive behaviour, the species could threaten the existence of the native species. In Australia, some of the identified invaders are like the Northern Pacific Seastar (*Asterias amurensis*) and dinoflagellate alga *Gymnodinium catenatum*. Table 1 is a list provided by CRIMP of known or likely exotic marine species in Australian waters that are possibly brought in via ballast water.

⁴Heywood, V.H. ed. 1995. Global Biodiversity Assessment, Cambridge University Press, Great Britain. It is published for the United Nations Environment Programme.

⁵Moyle, P.B. 1995. Ballast Water Introductions, American Fisheries Society, USA.

Ballast Water Management in Malaysia – A Status Overview

In Malaysia, ballast water is a subject that has not been studied or fully highlighted. This means there is a complete absence of information on the problems associated with the discharge of ballast water. The first step towards understanding the magnitude of the ballast water problem in Malaysia is therefore to fill the information gap in two areas – local marine biological diversity and possible introduction of species associated with ballast water. At present, no analysis has been carried out on this. This will mean problems in assessing the impact of ballast water on Malaysia's marine biological diversity.

The next step is to conduct ballast water sampling. Ballast water sampling and analyses are rudimentary steps before a risk assessment – which is defined as an estimate of damage caused by unwanted circumstances or agents and the consequences of that damage.⁶ The species inventory and the risk assessment analysis will assist towards communicating and formulating appropriate policy and management strategies.

Another area that needs to be looked into concurrently is the management of ballast water discharge in Malaysia. No effort has been made towards formulating guidelines and gazetted rules specifically for controlling ballast water discharges. Malaysian provisions such as the Environmental Quality Act and the Federation Port Rules will only be applied if the ballast water contains oil residue. Given ample evidence of problems caused by ballast water, it is important to learn the magnitude of the problem in Malaysia and to act upon it, since ballast water is by far the commonest vector of exotic species introduced.

Addressing the ballast water discharge issue is essential to protect and conserve

Malaysia's marine biological diversity. Invasion by alien species could result in a dramatic, irreversible and prominent change in the ecosystems or the ecosystem process. Furthermore, Malaysia would also be fulfilling her international obligations under international treaties such as MARPOL 73/78 and the Convention on Biological Diversity.

Species Sampling

There are many species groups that could survive in ballast water, ranging from large organisms that are usually in their planktonic life stage to bacteria and viruses.⁷ This section provides a conceptual idea of sampling and gathering information on alien species associated with ballast water. The 'how to do' outline given here is not exhaustive.

The first step in identifying potential aquatic invaders is to identify the potential geographic donor regions on the basis of several criteria.⁸ It was suggested that geographic realms with similar climates are likely to have greater potential for successful exchange of species. By analysing the country's shipping pattern, the possible donor regions could be singled out for survey of organisms in their incoming vessels. It was hypothesized that regions with growing economies are potentially accountable for transporting aquatic plants and animals around the world. Specific data could be gathered from the identified vessels such as the frequency of vessel visits, ballast quantities discharged and the physical nature of the ballast.⁹ Such information is required in order to evaluate the effectiveness of ballast water regulations should voluntary control measures be introduced in the country.

To characterise the density and diversity of ballast water organisms, samples could be collected from vessels arriving at ports using the plankton net. According to a technical report entitled

A Review and Evaluation of Ballast Water Sampling Protocols, net sampling through manholes is normally preferred over other sampling methods because it eases and speeds up the sampling process. However, this technique is appropriate only for full cargo holds and wing tanks. The report mentioned some other sampling techniques such as sampling with pumps using sounding pipes or air vents. These techniques have their own strengths and weaknesses. The good side of it would be that they provide access to a greater range of tanks. Unfortunately, sampling with pumps requires more cumbersome equipment and longer sampling duration. It can only be used when ballast pumps are in operation. Practicality and effectiveness are the keys to selection of the most suitable sampling method. It was further suggested in the article that a combination of methods should be considered to minimise the sampling bias of a single method.¹⁰

Ballast water from a single ship could contain hundreds of living species of phytoplankton, zooplankton, larval fish and invertebrates. At this stage, it is difficult to identify the species composition unless the samples are cultured in the laboratory. Culturing the species under a condition that is similar to Malaysian waters could also help scientists predict the species abundance.¹¹ In addition, it helps further analysis of species viability to adapt to their new sanctuary such as their tolerance limits and natural mechanisms for rapid dispersal.¹²

The sampling information would help in assessing the magnitude of the problem in Malaysian waters. If any of the species are detected, an unequivocal link could then be established between ballast water and the population found. Some groundwork on literature research of invasive species associated with ballast water is also useful as a basis for analysis and prediction.

⁶ Alexander, Mike. 1995. How Are Quarantine Risks Assessed? New Zealand.

⁷ Ibid.

⁸ Ricciardi, Anthony and B. Rasmussen, Joseph. 1998, Predicting the Identity and Impact of Future Biological Invaders: A Priority for Aquatic Resource Management, Canada. *J.Fish Aquat. Sci.* Vol. 55, pp. 1759-1760.

⁹ Hayden, Barbara. 1995. Assessing Ballast Water Volumes, Origins and Content of Ballast Water, New Zealand.

¹⁰ A. Sutton, Caroline, Kate Murphy, Richard B. Martin and Chad. L. Hewitt. 1998. A Review and Evaluation of Ballast Water Sampling Protocols, *Technical Report #18, Tasmania, Australia*.

¹¹ Ruiz, Greg. The Aliens Among Us, On The Rhode, Newsletter of the Smithsonian Environmental Research Centre, 1994 issue.

¹² Op.cit., Anthony Ricciardi and Joseph B. Rasmussen. p. 1761.

Table 1
Known or Likely Exotic Species in Australian Waters: Probable Origin and Reported Distribution

<i>Phylum</i>	<i>Class/Order</i>	<i>Genus</i>	<i>Species</i>	<i>Probable Origin</i>
Annelida	Polychaeta	<i>Boccardia</i>	<i>proboscidea</i>	N Pacific
		<i>Euchone</i>	<i>sp</i>	Unknown
		<i>Hydroides</i>	<i>elegans</i>	Europe
		<i>Mercierella</i>	<i>enigmatica</i>	Mediterranean,
		<i>Polydora</i>	<i>ciliata</i>	Europe
		<i>Pseudopolydora</i>	<i>paucibranchiata</i>	Europe
Arthropoda	Cirripedia	<i>Balanus</i>	<i>improvisus</i>	N Atlantic
	Decapoda	<i>Palaemon</i>	<i>macrodactylus</i>	Japan, China, Korea
		<i>Pyromaia</i>	<i>tuberculata</i>	N E Pacific
		<i>Rhithropanopeus</i>	<i>harisii</i>	N W Atlantic
	Mysidacea	<i>Neomysis</i>	<i>Japonica</i>	Japan
Chordata	Ascidiacea	<i>Ascidella</i>	<i>aspersa</i>	N Europe
	Pisces	<i>Acanthogobius</i>	<i>flavimanus</i>	Japan, Korea, China
		<i>Forsterygion</i>	<i>varium</i>	New Zealand
		<i>Lateolabrax</i>	<i>japonicus</i>	Japan, Korea, China, Taiwan
		<i>Sparidentex</i>	<i>hasta</i>	Arabian Gulf
		<i>Tridentiger</i>	<i>Trigonocephalus</i>	Japan, Korea, China
		<i>Trisco</i>	<i>dermopterus</i>	W Pacific-equatorial
Echinodermata	Asteroidea	<i>Astrostele</i>	<i>scabra</i>	New Zealand
Ectoprocta	Cheilostomata	<i>Membranipora</i>	<i>membranacea</i>	N Atlantic, cosmopolitan
Mollusca	Bivalvia	<i>Corbula</i>	<i>gibba</i>	S E Asia
		<i>Crassostrea</i>	<i>gigas</i>	Japan
		<i>Musculista</i>	<i>senhousia</i>	NW Atlantic
		<i>Perna</i>	<i>canaliculatis</i>	New Zealand
		<i>Soletellina</i>	<i>donacioides</i>	New Zealand
		<i>Tapes</i>	<i>Japonica</i>	Japan, Philippines
		<i>Theora</i>	<i>lubrica</i>	N W Pacific
		<i>Venerupis</i>	<i>largillierii</i>	New Zealand

Cyanide Fishing, Tubbataha Reefs and the Chinese Connection*

by Vic Milan

The author, who heads a marine conservation NGO in the Philippines, discusses the pernicious practice of the use of cyanide to catch fish live, which can kill entire coral reefs and destroy the fish habitat. He urges environmental activists to keep up their struggle to save the environment. "If we stop trying, all hope will truly be lost."

In a plush upmarket Hongkong restaurant one pleasant evening, a visiting businessman and his wife are treated by their local host to what is planned to be an unforgettable meal. The main course is a dish of green grouper – garnished with spring onions, fine strips of ginger, steamed, then doused with soy sauce. In the few seconds just before serving, the chef carefully pours hot boiling oil over the garnishing and there is a delicious crackle while the oil penetrates the soft and delicate meat. A mouth-watering aroma fills the air.

The other ritual that was intended to make a lasting impression on the guests was that they were allowed to pick the fish themselves, from several that were alive and swimming in a glass display tank.

One can visualise the host explaining to his guests the advantages in taste and flavour of fresh – they can't come any fresher than alive – grouper or wrasse, both coral reef food fish. Depending on the mood of the moment, he may even suggest aphrodisiac attributes to the evening's *piece de resistance*. Ventral fins are erect and firm only in live fish, you know. In a more serious tone, the Chinese host might say that live fish promotes speedy recovery for convalescing patients and nursing new mothers.

But what's the connection between this innocent business scene in Hongkong and my concerns as head of the Tubbataha Foundation, a marine conservation NGO in the Philippines?

Allow me, ladies and gentlemen, to take you on a fast trip to the Philippines, two hours by jet southeast of here. Mine is a nation of 7,000 islands, home to 65 million people who can somehow manage to maintain a rather laid-back lifestyle, who can smile through coup and coup attempts, roaring typhoons, rampaging floods and violent volcanic eruptions.

The Philippine archipelago lies in the "Fertile Triangle". Four diversity studies since 1954 showed that this triangle

possesses the most diverse marine biota of the world. Over 2,200 fish, over 3,200 molluscs, 488 species of coral in 78 genera, and 971 species of benthic algae in 209 genera, are found in the Philippines, mostly in the coral reefs. The fate of the Philippines' coral reefs is a planetary concern.

What and Where is Tubbataha?

Tubbataha is from two Muslim words, Tubba and Taha. Tubba is for long, and Taha for shore, or reefs, or lagoon.

Tubbataha Reefs is in the middle of the vast Sulu Sea. Thirty-three thousand hectares of one of the most fabulous coral reefs in the world. Home to hundreds of species of both food fish and exotic tropical aquarium fish. Home to



* Talk delivered at the Conference on "Trade & The Environment in Pacific Rim Nations" organised by the American Bar Association at the New World Harbor View Hotel, February 15-17, 1993, Hong Kong. Reproduced from Coastal Management in Tropical Asia, September 1993.

hawksbill and green turtles, and to boobies and terns, and 44 other species of birds (including occasional warblers vacationing from the freezing cold of the Russian tundra).

It is now known as the Tubbataha Reefs National Marine Park, the first and the only national marine park in my country (now being considered for declaration as a World Heritage Site).

Flashback: Just a little over three years ago, we waged a fierce battle with a big and influential Filipino company that is the world's fourth largest processor and exporter of seaweed products. Shemberg Marketing Corporation, based in Cebu in central Philippines, had started a seaweed farm within the Park – in violation of provisions in a 1988 Presidential Decree declaring Tubbataha a protected area and national park. The provincial governor of Palawan, unbelievably, chose to side with Shemberg. As President of the Tubbataha Foundation, I assisted the fight in public forums and in both print and media to evict the park violators.

There are friends today who insist that I almost became my country's Chico Mendez (the Brazilian environmentalist who had incurred the ire of those who wished to continue raping the Brazilian rain forest). I did receive a few death threats.

But after about a year of the highly publicised skirmishes, we won an eviction order from the Department of Environment and Natural Resources – which Shemberg and the Palawan governor brazenly ignored. When another similar eviction order was laughed at, we persuaded the government to deputise the Tubbataha Foundation to assist in the law enforcement effort. One day soon after, I had the pleasure of torching the makeshift structures.

But tranquility, as it turned out, was to be an elusive dream for the marine and wildlife of Tubbataha. Our inadequately funded and equipped patrol operation reported poaching activities by both local and foreign vessels. Their priority activity – because it is the most profitable – is catching live groupers and wrasses to supply the demand from Chinese buyers in Hongkong, Taiwan and now, we are told, China.

So what is so bad about catching live fish? It is not so much that catching fish in commercial volumes is *verboden* in Tubbataha. They're using sodium cyanide, drums and drums of it, to catch live fish in Tubbataha and other formerly super-rich fishing areas of Palawan and the Sulu Sea.

I think there is no need for me to elaborate on the high toxicity of cyanide. One form of capital punishment is administered by releasing a pellet of cyanide into a pail of water under the condemned man's seat. The resulting fumes that rise paralyse the central nerves of the convict and he is dead in seconds.

I think I know what you're thinking. How then is cyanide used to catch fish alive?

A solution of sodium cyanide crystals dissolved in water is squirted into the coral resting nooks of tropical and food fish. The fish is knocked unconscious. But transferred to a tank of clean seawater, it revives. And unless it got a truly lethal dose, it survived days in a fishing vessel's seawater wells, the long journey by air and sea (sometimes just by sea all the way from Palawan waters to the harbours of Hongkong or Kaoshiung), and the days it has to stay on display in the classy restaurant until it catches the fancy of a well-heeled diner.

Allow me to shock you with a few innocent looking statistics: In 1991 alone, 3,566,000 kg of sodium cyanide were brought into the Philippines by companies supplying mining and farming operations. That's enough cyanide to gas all 65 million people in my country. The figure was even higher in 1992, 3,993,000 kg.

We now know that a good part of these otherwise legal shipments found their way to the illegal fishing sector. How much, we are still attempting to establish. The volume of smuggled sodium cyanide, plus those brought in illegally by foreign fishing vessels, is another story.

Fresh, but dead, grouper in Manila you can have for \$5 to \$8 per kilo. Do you know how much the Manila-based exporter of live grouper or wrasse pays the Filipino live fish trader? As of the

time I left the Philippines, which was just a few days ago, traders were selling to Manila exporters at US\$ 70 per kilo!

Is it any wonder that traders are bringing into my country sodium cyanide by the ton, that foreign vessels are sneaking into Philippine waters bringing their own supplies of sodium cyanide for their network of local fishermen cohorts – sometimes with the connivance of politicians and law enforcement officials?

Three weeks ago my office received a reported rumour that about 100 drums of sodium cyanide had been shipped out of Hongkong and were supposedly destined for Papua New Guinea where fishermen were to be taught how to use the deadly cargo to catch live fish. My God, I thought, have they finished with the Philippines so that they are now trying greener pastures?

Food fish is but one target of sodium cyanide users. Tropical fish, in demand by pet shops and pet shop suppliers in the United States and Europe, and now, I'm told, in Taiwan, is another lucrative international trade that is, knowingly or not – more knowingly than not – causing havoc on our coral reefs, the natural habitat of both food and tropical aquarium fish.

So what's the problem, over-harvesting? That is but one of the serious problems. One short contact with the sodium cyanide solution and corals die. No corals, no fish habitat, no fish. And it may take decades for a coral reef killed by cyanide to regain just 50% of its former pristine glory.

I have no quarrel with the businessman or his family in Hongkong, or in Taiwan, or in China who can afford the price of live Philippine fish. The reasons for wanting the fish not just fresh but alive could be cultural, and I respect that.

But when it means, that we might lose, as we are now in danger of losing, the Tubbataha Reefs, that we lose, as we have already lost, many of our other coral reef communities, I think we have good reason to raise the alarm, as I now do before this forum.

In preparation for this piece, I went through a report on the subject by Dr. Vaughan Pratt of the International

Marine Life Alliance. Here are some highlights:

- Philippine coral reefs produce three to 37 metric tons of fish per year per square kilometer.
- Destruction of coral reefs is a major contributor to poverty in coastal communities.
- Five million Filipinos are deficient in protein, vitamins and minerals which could have been derived from seafood.
- Less than 1% of those arrested (for using cyanide and dynamite) are convicted.
- Coral colonies killed by cyanide DO NOT regenerate.
- 160 million kilograms of fish worth US\$8 million are lost annually due to coral reef destruction.
- Industries that also suffer because of coral reef destruction include commercial food fishing, aquarium fish, sport scuba diving and tourism.
- High prices are asked by the aquarium and shell traders for certain species which have approached or reached the categories

of rare, threatened or even endangered species.

- "The fate of the Philippine coral reefs is a planetary concern".

We in the Philippines have no quarrel with the businessman in Hong Kong who only desires to give his guests a memorable dinner treat. He obviously can afford it. And so do our Chinese neighbours who believe, perhaps as part of their culture, that live fish is for good eating, good health, long life, or even a lively sex life.

But we also think that if this active and obviously profitable trade in live fish directly contributes to the annihilation of our coral reefs, affecting our coastal fishermen, and our still developing ecotourism industry, we have to put up our collective hands and say – Stop! You are killing the goose, and it is our goose that lays the eggs that we cannot even afford to buy, because you want all of it.

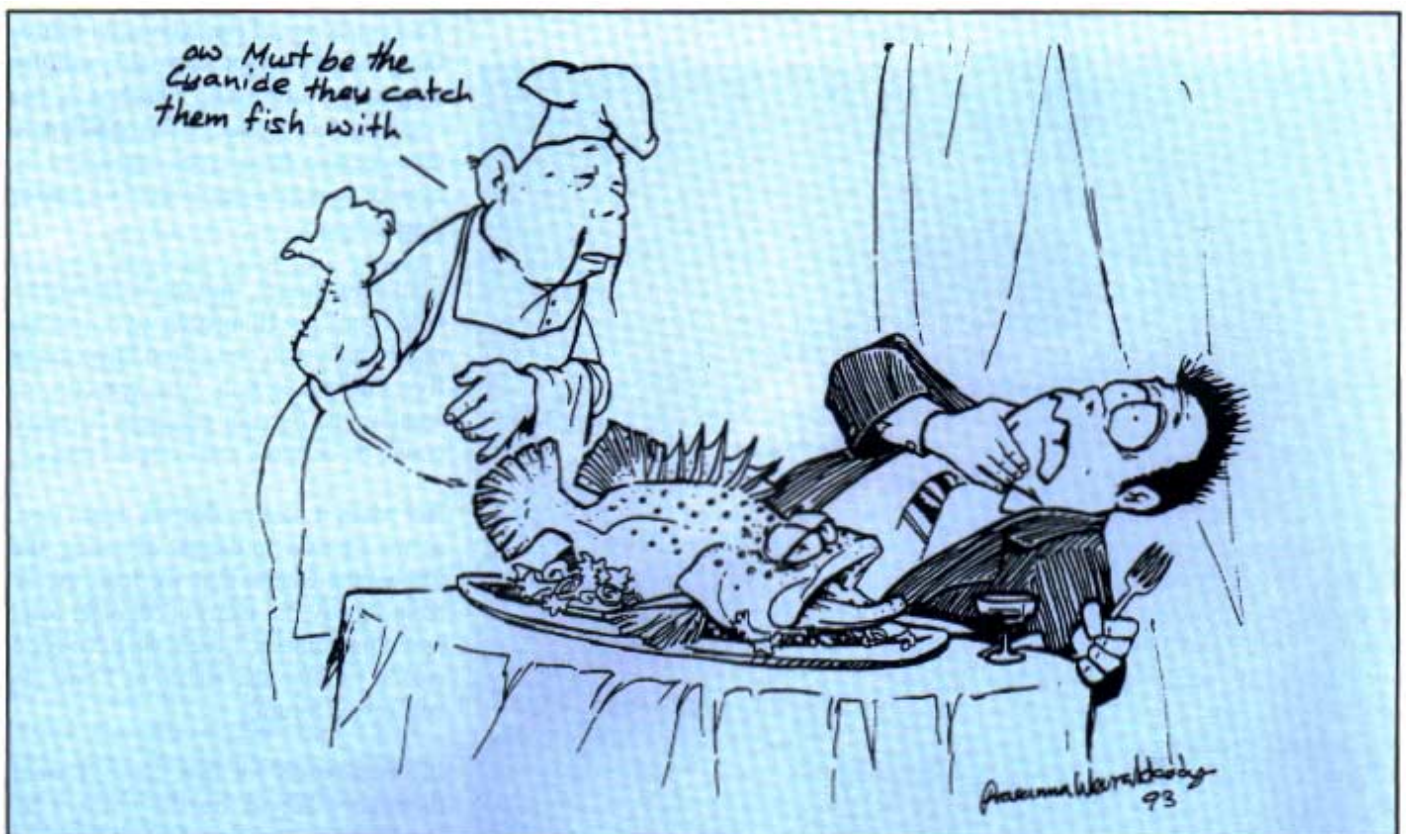
The City of Puerto Princesa, in Palawan, recently passed a law banning the export of all live fish. Two other townships in the province of Palawan followed suit. The ordinances are now under review by the provincial board.

The live fish exporters, understandably, are not celebrating. Now the lawyers of Philippine Airlines are formally opposing the forthcoming ban. And the Philippine Airlines station area manager in Palawan is spreading the word that his company is now seriously considering changing the flight schedule to the night hours to inconvenience the citizens, and to eventually downgrade the service from 737 jets to the smaller capacity turbo prop Fokkers ... all this in retaliation against the city's ban that will mean a loss of 11 million pesos monthly in cargo revenues from live fish traders.

Increase in trade is good. But often times it gets to a point when something's gotta give. In the case I have just discussed, what is giving, and going rather fast, are our marine resources, our health, our future, our very lives.

In my work as an environmental activist, I have often stopped to ask, "Are we in the activist NGO community, are our long hours and our cries in the media, in various fora, in international conferences such as this ... are we making a difference?"

We do not know for certain if we are making a difference. All we know is that if we stop trying, all hope will truly be lost.



Points of View: ‘Putting Fisheries Management Back in Places’

by Daniel Pauly

An eminent fisheries biologist makes a few predictions about the future of fisheries management. Despite negative trends, he believes that “we humans will, in the next millennium, find ways to match our numbers and our demands with what our planet can provide.” But it will be essential to “rediscover places for fisheries management”.

Except, miraculously, for Jules Verne’s, scientific predictions always turn out to be wrong. However, the 3rd millennium is coming, fisheries resources are going, and it is impossible to resist the urge to take the plunge and make a few predictions about the future of fisheries management, and of the scientific discipline. And no, the ‘s’ at the end of the title is not out of place: I shall suggest that in the future, fisheries management and its associated science will have to deal with ‘places’ far more than they have in the recent past. Indeed, I shall suggest that they will have to return, in many cases, to ancient modes of allocating fisheries resources to local communities, rooted in physical places.

The trend now is going somewhere else, toward privatisation of fisheries resources through Individual Transferable Quotas (ITQs) and similar instruments (Pauly, 1996), and there are also attempts to privatise the research scientists and the detailed assessment work that these instruments require (see e.g. Annala, 1996, and other contributions in Munro and Pitcher, 1996). However, this trend will crest when it is realised that, while eminently compatible with the acquisitive mood of our times, self-interested exploitation schemes do not resolve, any more than the open-access schemes they might replace, the basic discrepancy between human and natural time scales.

Many fisheries resource species, e.g. demersal fish in temperate waters and large predators on coral reefs, are long-

lived, with natural mortalities of 0.1 – 0.2 year⁻¹, and often less (Pauly, 1980). This implies that, for exploitation to be sustainable, fishing must not extract more than about 10% of the stock biomass per year, especially in data-sparse situations (Walters and Pearse, 1996). Even such low level of fishing mortality is sufficient, however, to quickly remove accumulations of large, old females – the source of most of the eggs and subsequent recruitment to stocks of long-lived fishes. This is so because the relationship between fish size and egg production is highly non-linear, with large females being far more fecund than an equivalent weight of small ones. Indeed, this non-linearity is so pronounced that for example one single ripe female red snapper, *Lutjanus campechanus*, of 61 cm and 12.5 kg, contains the same number of eggs (9300000) as 212 females of 42 cm and 1.1 kg each (Bohnsack, 1990).

The massive reduction of egg production, relative to unexploited stocks, coincident with the removal of such females, that occurs even when a very low fishing mortality is applied, is one of the reasons why exploited stocks fluctuate as much as they do, notwithstanding the effect of environmental fluctuations (Hutchings and Myers, 1994; Myers et al., 1995). F.I. Baranov, one of the founders of fisheries science, was perhaps the first to realise that “by reducing the fish population, fishing itself provides the increment which, in turn, sustains the fishery” (Baranov, 1927). Let’s not wait too long to admit that, similarly, fisheries also generate many of the fluctuations that beset fisheries, all the way to the occasional collapse – the ultimate fluctuation.

Further, even low fishing mortalities, when applied with a gear such as a

bottom trawl, will have profound effects on the habitats of demersal fish species, notably by eroding often century-old bottom structures such as ‘oyster reefs’, sponge communities (e.g. of *Poterion* in Southeast Asia) and other beds of sessile, filtering organisms. The result is increased water turbidity, and a gradual transition, within coastal ecosystems, from a demersal to a pelagic food web – a very common type of transition (Pauly, 1988, provides a case study). A similar process occurs when coral reefs are stressed, except that the primary production, previously fuelling their repair and growth, tends to end up in filamentous green algae, and in whatever can eat those.

Thus, my contention is that even very low rates of fishing mortality are unsustainable in demersal stocks unless a sizeable fraction of their spawning adults are completely inaccessible, owing to some natural refuge (underwater canyons, large boulders, etc.). These refuges are, should I mention it, the very spots which good fishers must discover and drain if they are to maintain high individual catches and their reputation – whatever the average level of fishing mortality. But can we reconcile the vastly different time scales of humans and fish, and of benthic communities? Not through application of ‘optimal’ rates of fishing over large areas, however detailed the studies that led to their estimation. Rather, these different time scales require new refuges – marine reserve areas (MRAs) – providing shelter to a wide variety of species, including major commercial species thus protected from the ultimate fluctuation (see page 5-6).

For this to work, though, there must be agreement not to fish in certain places,

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which can happen only if those who do not fish within the MRAs accept their rationale, and benefit from their existence, i.e. if a sense of place re-emerges within fishing communities, as they become the local guardian of the resources and not their roving executioners. Such agreement may emerge if our science continues to confirm that suitably placed and suitably sized MRAs will perform for us

what is expected of them (see Roberts *et al.*, 1995, for an attempt at a consensus statement). And, perhaps not surprisingly, given the wide scope of their sizes, ideas implicit in Beverton and Holt's classic, or explicitly dealing with MRAs, because yes, they also dealt with those (see pp. 365-368 of their 1957 book, either in the original, or the reprinted versions, and Pauly, 1993).

Though sometimes tempted by pessimism, I believe that we humans will, in the next millennium, find ways to match our numbers and our demands with what our planet can provide (this is not so for the time being). This will require that we abandon rape and pillage as our major mode of interaction with natural resource. For fisheries, it will require rediscovering places for fisheries management.

April 22, 2000 – 30th anniversary of Earth Day

Five hundred million people and thousands of organizations from all the continents will unite on April 22, 2000 – the 30th anniversary of Earth Day – and make it “the largest and most effective environmental event in history”.

Working with citizens from every nation on earth, the Earth Day Worldwide Network is using grassroots organisations and Internet to plan events and programmes, compare problems, share solutions, build an ever-deepening knowledge base and empower even the remotest citizen. The Network plans to unite “pro-environmental forces” to educate, empower and inspire actions to protect the earth.

“Everyone who participates in Earth Day 2000 is a force for change,” says the network. “Each individual’s voice added to the cause strengthens the possibility that the call for change, will be heard and acted upon.” The network’s website www.earthday.net contains details of events planned in every country.

- In the Philippines, a massive environmental concert for youth will be broadcast live all across Asia.
- In Mexico, 30,000 high-school students will plant trees in the capital.
- In Ghana, a 3-day workshop will teach skills in natural resource conservation to women and youth.
- In the U.S., movie star Leonardo diCaprio will lead a huge rally at the Mall in Washington D.C. He will wear a specially designed Earth Day T-shirt.

The network urges the youth of the world of “find out what is happening in your country for Earth Day 2000”. “Organise an event in your community, school or business. Attend an event – or help someone else who is organising an event. Pass this message on to a friend or colleague.”

The first Earth Day was organised in the United States on April 22, 1970. Twenty million citizens came together for the event. Their collective effort forged the creation of the main environmental agency in the U.S., as well as the nation’s first serious laws on clean air, clean water and protection of endangered species.

The first global Earth Day was organised 10 years ago – on April 22, 1990. This time 200 million people took part. That international groundswell contributed to the success of the first Earth Summit held in Rio de Janeiro, one of the biggest and most publicised events in history. It also led to the establishment of environmental protection agencies in many countries.

“Earth Day 2000 will harness 30 years of commitment and momentum to create a united global voice for a hopeful planet-wide sustainable future,” says the network. “Join us today”!

The Earth Day Worldwide Network is located at
91 Marlon Street, Seattle, WA 98104, USA. Tel: 1.206.876.2000. Fax: 1.206.682.1184.
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BAY OF BENGAL

Bay of Bengal News is a quarterly publication of the Bay of Bengal Programme (BOBP), a regional multi-agency fisheries programme which covers seven countries around the Bay of Bengal – Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The programme plays a catalytic and consultative role: it develops, demonstrates and promotes new methodologies, techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in the member countries. The BOBP is sponsored by the governments of Denmark and Japan, and by member governments in the Bay of Bengal region. The main executing agency is the FAO (Food and Agriculture Organization of the United Nations)