REGIONAL WORKSHOP ON IMPLEMENTING THE ECOSYSTEM APPROACH TO COASTAL FISHERIES AND AQUACULTURE

Garry Preston[1], Lindsay Chapman[2] and Andrew Smith[3]

A two-day workshop on implementing the ecosystem approach in coastal fisheries and aquaculture brought together government representatives from both fisheries and conservation/environment departments from around the Pacific. This was the first time that representatives from these areas have come together to discuss fisheries-related issues and to work towards a common approach to address the issues.

The workshop (held in Noumea, New Caledonia on 29 and 30 October 2007) was opened by SPC's Director-General, Dr Jimmie Rodgers. He commended the inter-agency approach — the workshop included participants from different government departments that may have an influence on marine resources — and encouraged the promotion of further cross-disciplinary approaches in the future. He also noted the wide range of resource people attending the workshop: agencies included the Food and Agriculture Organization of the United Nations (FAO), the US Western Pacific Regional Fisheries Management Council (based in Hawaii), the government of Western Australia, and the Pacific Islands Forum Fisheries Agency. Dr Rodgers also referred to the World Summit on Sustainable Development commitment to implement ecosystem-based fisheries management by 2010, and stated that he expected participants to shape the direction for implementation of the ecosystem approach to fisheries (EAF) at the national level. He emphasised the need to create broad-based ownership and involve all stakeholders, particularly resource owners, in order to achieve sustainable solutions.

SPC's Coastal Fisheries Programme Manager, Lindsay Chapman, chaired the workshop, which included presentations from regional agencies that are currently implementing the EAF, as well as small group discussions on specific topics. Workshop objectives were to:

- develop a common understanding of the principles and approaches to the EAF in coastal fisheries and aquaculture;
- assess the status of EAF implementation in coastal fisheries and aquaculture in Pacific Island countries and territories (PICTs); and
- develop an approach for regional assistance by SPC and other agencies to implement the EAF at the country level.

Lindsay Chapman advised participants that the workshop would also serve as the starting point for a study being financed by The Nature Conservancy (TNC) and carried out by fisheries consultant, Garry Preston. All countries and territories were provided with a questionnaire prior to the meeting, and were asked to provide background information on the different agencies (international, regional, governmental and non-governmental) involved in fisheries, and the main issues in regard to implementing EAF management (EAFM) at the country level, among other things. The purpose of the study is to identify and document common principles and approaches to the strategic implementation of EAFM in the region. The study will:

- summarise the highest priority issues and gaps relating to adoption and implementation of EAFM in the region;
- identify strategies or proposals for addressing these; and
- identify potential roles, responsibilities and actions for SPC, other regional organisations, institutions and key non-governmental partners (including TNC), to ensure the adoption and effective implementation of the EAFM in the region.

The study will produce a number of reports and these will be widely distributed in the region for country comment and input before being finalised. In addition, a presentation of draft study findings will be provided to the Special Heads of Fisheries Meeting to be held in Apia, Samoa (11–13 February 2008).

Summary of presentations

Presentation 1 — Masanami Izumi, FAO

Mr Izumi (FAO) made a presentation on FAO's approach to the EAFM. He advised participants

[1] Consultant with Gillett, Preston and Associates.
[2] SPC's Coastal Fisheries Programme Manager
[3] Director of the Pacific Coastal Marine Programmes, The Nature Conservancy (TNC)

that, six years ago, the 2002 Reykjavik Conference on Sustainable Fisheries in the Marine Ecosystem resulted in a declaration in which member countries committed to the principles underlying an EAFM. The 2002 World Summit on Sustainable Development in Johannesburg made specific reference to the Reykjavik Conference, and set 2010 as a target for countries to implement an EAF. The ecosystem approach was adopted by the FAO Committee on Fisheries in early 2003. FAO defines the ecosystem approach as follows:

> *An Ecosystem Approach to Fisheries strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries.*

By addressing both human and ecological well-being, the definition above recognises that EAF intends to implement sustainable development concepts in fisheries. This definition merges two paradigms: 1) protecting and conserving ecosystem structure and function, and 2) fisheries management, with its focus on providing food, income and livelihoods for humans.

Mr Izumi gave examples of how an EAFM might be required with regards to trawl fisheries and the incidental capture of seabirds in longline fisheries. He pointed out the growing influence of environmental and conservation non-governmental organisations (NGOs) and international bodies in demanding a more responsible approach to marine resource exploitation. He noted that the United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Conference on Environment and Development (UNCED), and FAO have prioritised adoption of the EAFM by their adherents, with 40% of the FAO Fisheries Department's budget allocated to this. The EAFM is an extension of conventional fisheries management but recognises the need to consider and manage fisheries as an integral part of the broader natural and social environment through approaches such as implementing the FAO Code of Conduct on Responsible Fisheries, greater attention to biodiversity, and better sectoral integration. In summary, Mr Izumi concluded that the concepts and principles of EAFM are now becoming clear, and that FAO has unique skills and capabilities to promote the EAFM.

Presentation 2 — Jarad Makaiau, WPRFMC

Mr Makaiau (Western Pacific Regional Fisheries Management Council) gave a presentation on the EAFM being used within the WPRFMC, which groups together the US-affiliated islands and freely associated states in the Pacific. The Council's aim is to ensure sustainable fisheries that are socially and environmentally responsible. The Council includes a number of US federal and territorial agencies, and is advised by technical agencies, ad hoc stakeholder groups, and the industry. There are currently management plans in place for five major species groups, but the trend is to move towards more comprehensive plans that address resource groups, such as coastal or demersal species. Mr Makaiau noted the importance of addressing terrestrial issues such as garbage disposal, and including coastal development in fisheries management considerations. Many activities that have nothing to do with fishing have impacted negatively on marine resources, and these need to be addressed. In the Pacific Islands, traditional knowledge can contribute to the EAFM, but this tends not to be sufficiently recognised or used. Greater attention needs to be paid to developing partnerships with communities in managing their marine resources. WPRFMC is currently developing a management indicator in the form of a model to assess the health of coral reef fisheries. It examines changes in the trophic level of catches over time in order to determine whether US insular states are "fishing down the food chain".

Participants noted that the Council's fisheries management plans appeared to be already fully consistent with the EAFM. Mr Makaiau confirmed that this was the case, and that US policy had not changed in regard to the requirements for fishery management plans. US laws require the Council to prepare species or species group management plans, applying "conventional fisheries management tools". Through an EAF planning framework WPRFMC is now trying to shift from single species plans to plans that are better aligned to the ecosystem approach, but single species plans will still be required by law. However, the collection of ecosystem information provides a broader framework in which the plans can be embedded.

The workshop commended Mr Makaiau on the Council's approach to using traditional information and knowledge in its approach to EAFM, but noted that in some cases such knowledge has been lost. Mr Makaiau agreed, and noted the difficulty of accessing traditional knowledge even in places where it still exists. Traditional knowledge is generally not written down, and those who hold it may be reluctant to share it due to tradition and custom.

Presentation 3 — Maruia Kamatie, FFA

Mr Kamatie (Forum Fisheries Agency) made a presentation on FFA's EAFM approach to tuna fishery management. He noted that FFA's approach, which attempts to identify the full range of issues impacting on the resource, has so far been introduced in four FFA member countries. Ecological elements include target species, bycatch species and the general ecosystem, while human elements include community well-being and administration. Ultimately this allows the development of a component tree based on these five elements, which in turn leads to a prioritisation process and a risk assessment that helps select the management strategies to be adopted. Performance measures, monitoring requirements and thresholds for management responses can then be determined. Mr Kamatie noted the somewhat differing views on management expectations and outcomes (such as resource conservation, economic yield or social benefits) that different stakeholders may hold. He also emphasised that the EAFM is a management process, not a research process.

Presentation 4 — Rick Fletcher, WA Fisheries

Dr Fletcher (Western Australia Fisheries and Marine Research Laboratories) noted that within the Pacific, the EAFM is not about managing fisheries for the sake of the environment, but to provide benefits to people and society within this region.

In Western Australia the 30 managed fisheries have already each been assessed for their compliance with EAFM principles. The assessments were required by regulations; fisheries that do not comply will be unable to sell or export their products. Western Australia uses a similar process to FFA in regard to the identification and prioritisation of issues using risk assessment. Dr Fletcher noted that processes developed for the EAFM approach are now being applied to the agriculture sector and other terrestrial activities such as soil and salinity management.

WA is now moving to not only assess individual fisheries, but to also assess their combined or cumulative effects at a regional level, including the activities of other sectors (e.g. terrestrial activities). As in other countries, the regional-level EAFM process in WA is complicated by the wide range of sectors (e.g. mining and coastal development), stakeholders and government agencies (at both state and federal levels) involved, which leads to poor coordination and duplication of effort.

Dr Fletcher concluded his presentation with a number of lessons on the EAFM process, including recommendations that scientists not be allowed to dominate what is essentially a management process, and not to wait until more information is gathered before beginning the process.

The question arose as to whether the fishing industry had any responsibility to ensure its own compliance with Western Australia's EAFM requirements. Dr. Fletcher responded that industry was not required to do its own research in this regard, but that research carried out by the government was financed mainly from levies on the industry.

Presentation 5 — Mike King, consultant

Dr King gave a presentation on EAFM efforts by the Coastal Fisheries Management Section of SPC's Coastal Fisheries Programme. He cited some ecosystem impacts of fishing, including harvesting parrotfish, which allows algal growth on corals, and removal of triggerfish, which allows sea urchin populations to expand. He also gave examples of some land use practices that impact on the region's coastal marine resources, including sedimentation resulting from poor land management practices and excessive nutrient inflows caused by sewage and farming. These cause coral smothering, infilling of inshore lagoons, seagrass growth at the expense of corals, and blooms of undesirable algae and other microorganisms, which in turn may lead to increased incidences of ciguatera and other health problems. He pointed out that many of these issues were beyond the capacity or scope of fisheries management agencies to address directly, indicating the need to involve a range of agencies in the EAFM. Possible solutions to some problems might include promoting community-based management, and a requirement for environmental impact assessments on development projects (especially projects undertaken by governments). Dr King provided some suggestions on the development of management targets and reference points that might be applicable to some Pacific Island fisheries. He also noted that marine protected areas (MPAs) are likely to become an increasingly important tool in managing the region's coastal fisheries. He concluded by noting the difficulty of getting government agencies to work together to address external impacts affecting fisheries.

Dr King was asked if there was information on the impacts of global warming on marine resources. Dr King advised that some literature is available on the subject, but that global warming is a large-scale issue that will be difficult for small countries to influence, and probably beyond the scope of the present workshop.

There was some discussion of an earlier comment by Dr King that "fishing down the food chain" was unlikely to occur in tropical reef fisheries, as well as the use of maximum sustainable yield (MSY) as a management target. Dr King responded that while fishing down the food chain is certainly possible in tropical fisheries, it seems less likely to occur when many trophic levels are being targeted. As regards sustainable yields, MSY is now considered a somewhat dangerous target to aim for, and maximum economic yield (MEY) is more frequently used. In many fisheries, however, insufficient data means that management is not based on either of these calculations, but on rules of thumb or intelligent guesswork.

General discussion on the presentations

The workshop noted that coastal erosion is a further unwanted consequence of degraded lagoon and reef systems. Earlier statements regarding the nature of the EAFM — that it is a process of managing humans, not ecosystems — were reiterated. Fisheries inevitably result in change, but the EAFM provides an alternative way of assessing what changes are acceptable. It may be acceptable from a fisheries perspective to allow reduction of stocks of an apex predator to 30% of its original biomass, but this may be unacceptable from other perspectives, if, for example, removal of this predator results in the expansion of undesirable species.

It was pointed out that the discussion of the EAFM appeared to be branching into two broad themes: the idea that fisheries management may impact other aspects of the ecosystem, which is within the capacity and mandate of fisheries management agencies to address; and concept of integrated coastal management, in which fisheries is one of a number of sectors in a broader framework that requires broad interagency consultation and a higher-level management decision-making process. Essentially, managing the downstream effects of fisheries on ecosystems and other sectors may be within the capacity (and mandate) of fisheries agencies in the region. In contrast, it may not be possible for fisheries agencies to address upstream effects (i.e. the impacts other sectors may have on the marine environment, including fisheries).

It was noted that in American Samoa the approval of development projects is required by a Coastal Management Board, which is composed of all agencies dealing with topics relevant to the Board's mandate (fisheries, health, environment, etc). Development projects must obtain permits from each relevant agency and approval of the Board before they can proceed.

Similar arrangements are being established in Cook Islands in order to address broader coastal management issues, where community consultation is an important part of the process. Government departments are working together to address cross-sectoral issues, such as sewage from pig farms entering Rarotonga's lagoon. This was commended as a very positive development, and contrasted with the situation that existed just a few years ago, when it was highly unlikely that a fisheries department would spend its money on issues not directly related to fisheries.

In Palau, arrangements similar to those described for American Samoa are being put in place. This does not always ensure that development projects receive sufficient scrutiny, but the situation is improving. As part of its commitment to the EAF, Kiribati has declared the Phoenix Islands as an MPA.

The question was asked as to whether a generic EAF model for the region is needed, given the differing circumstances among PICTs. It was noted that even though there may be no common model or approach that suits all situations, countries could nevertheless share experiences and learn from each other. In Kosrae (Federated States of Micronesia), the need to balance environmental protection with economic development was also recognised.

The authorisation of development projects through high-level government decisions in the absence of environmental assessments or other due process was cited as a problem in the region.

Participants also asked which regional agency in the region is mandated to coordinate country actions in regard to the implementation of the EAFM in coastal fisheries. Lindsay Chapman responded that members of the Council of Regional Organisations in the Pacific (CROP) would have to coordinate in order to divide responsibilities and actions with respect to the EAFM.

Working groups

The remainder of the workshop was conducted through working groups, all of which discussed the same specific questions and then reported back during plenary sessions. Four working groups were formed; discussion topics were based primarily on the presentations made earlier in the day. The discussion group topics and a summary of their findings follow.

Working Group Topic 1

What common principles do you extract from the various presentations as defining the "ecosystem approach" in respect of coastal fisheries management? Also, are any of

these principles in conflict with your own national understanding or interpretation of the "ecosystem approach"?

Some of the key conclusions from the working group presentations were summarised at plenary by the consultant. Of the 16 principles identified by the groups, those most commonly thought to be of highest relevance to the Pacific Islands region were as follows (numbers in brackets indicate the number of groups that reported a particular theme or issue).

- EAFM requires broad stakeholder engagement — community, fisheries, environment, NGO, industry (4);
- EAFM must recognise the interdependence between people and environment, and focus on managing people and their activities (4);
- There is a need to recognise and incorporate traditional knowledge and management practices into EAFM (3);
- EAFM will benefit from a spatial planning approach (ridge to reef) to address terrigenous effects on marine spaces (2);
- EAFM requires a holistic approach, involving environmental, sociocultural and economic issues (2);
- EAFM aims to maintain ecosystem services and functions for fisheries and other uses (2);
- Fisheries (and other sectors) must be managed to avoid unsustainable development and minimise environmental impact (2);
- EAFM requires a shared vision and a common goal among participating stakeholders and agencies (2).
- It is not possible to address all issues, so the processes of risk assessment and prioritisation are critical (2).

In addition to these EAFM principles, many groups provided comment on the challenges and opportunities that they presented. Of the 19 challenges identified, those most commonly mentioned were:

- inadequate inter-agency collaboration, and conflicting agency remits and mandates (3);
- political interference and lack of high-level commitment to EAFM and broader environmental issues (2); and
- partitioning the roles and responsibilities of different levels of government (national, state/ province, local).

As regards opportunities, of the 11 identified by the working groups, those most commonly mentioned were:

- EAFM can commence now; there is no need to wait (2);
- Inter-agency collaboration can be improved through formal working arrangements such as committees, memoranda of understanding, etc. (2);
- Policy can be favourably influenced by public advocacy or prominent personalities, as well as through initiatives such as the Micronesian Challenge (2).

In general there was less consensus among the groups on challenges and opportunities.

Working Group Topic 2

Bearing in mind the principles of the ecosystem approach agreed above, what existing elements of coastal fisheries management in your country can be considered already "EACFA (ecosystem approach to coastal fisheries and aquaculture)-compliant"? Also, what existing coastal fisheries management measures or traditions are not "EACFA-compliant" or work against the implementation of the EACFA?

Each working group reported the conclusions of its deliberations back to the workshop, based on the initial list of principles identified above (main outcome from the first group discussions). Most groups reported on specific situations in each country represented in the group, without analysing common themes. The information presented on individual countries was quite detailed and will be helpful in the follow-up work that will be done after this workshop by the consultant. However summarising the information was difficult as many of the issues identified related to only one country, were different among countries, or concerned several of the identified EAFM principles. Table 1 summarises some of the common ideas that emerged from the working group presentations.

Table 1: Working group findings on Discussion Topic 2.

Principle	What is compliant	What is not compliant
Implementation of the EAFM requires a participatory approach that involves all stakeholders.	• Inter-agency boards and/or committees that must sign off on development projects. • Stakeholder engagement through advisory committees and MOU. • Partnerships with national and local NGOs. • Area management plans. • Fishery legislation that provides for management planning through consultation. • Formal public hearings on projects and proposals. • Informal task forces, communication and information sharing among public agencies.	• Exclusion of important sectors from committees or other working arrangements. • Poor inter-agency coordination. • Lack of regulation of local fishers and markets. • Live rock and aquarium trade. • Translocation of marine species. • Conflicts between users and/or interest groups. • Varying expectations among communities with different levels of development. • Decisions made without proper consultation.
Traditional knowledge should be incorporated into the process wherever possible.	• Conservation area planning. • Community-based fisheries management plans. • Traditional gear restrictions and closed seasons. • Review of legislation and proposals by customary authorities. • Community representation through agencies or bodies formed for that purpose.	• Community structure in Melanesian countries may make community-based management more difficult. • Traditional ownership conflicts. • Traditional fishing activities or user rights are not always in line with EAFM (e.g. turtles, destructive fishing methods). • Lack of enforcement authority by traditional bodies or local communities.
Absence of scientific information should not be used as a reason for not commencing to implement the EAFM.	• Implementation of plans and strategies, including community-based management plans. • Use of scientific information where it is available. • Precautionary measures that preclude fishing activities in the absence of scientific information.	• Inadequate monitoring of human impacts. • Inadequate review and adjustment of plans to adapt to changing circumstances. • Pressure by interest groups to require scientific justification for government decisions on resource management. • Requirement for MSY to be used in fishery management plans.
A holistic approach is needed when planning and implementing the EAFM.	• High level environmental or other policies and mandates. • Regional mechanisms for integration/ regional agencies. • National integrated coastal management frameworks (e.g. ridge to reef) • Aquaculture development and management plans. • Rehabilitation of mine and earthwork sites. • Water discharge and waste management regulations.	• Limited policy activity coordination by national government. • Poor donor harmonisation. • Single-species management frameworks. • Differing scales required for different management actions. • Most outer-island developments.
Principles of sustainable development need to underlie the EAFM.	• Requirements for environmental impact assessments. • Existing fisheries management arrangements based on the precautionary approach. • Planning processes requiring that environmental, social and economic issues be addressed.	• Distortion of management arrangements by economic or commercial factors or priorities. • Low acceptance of EAFM by large commercial enterprises, especially in the mining sector. • Insufficient regulation of coastal development.
The EAFM, like all forms of resource management, is based on controlling and influencing human activity rather than directly changing the ecosystem.	• Community-based management programmes. • Education and public awareness programmes. • Fishery input controls (licensing/ permitting).	• Inconsistent and/or changing government policies, political agendas. • Monitoring small-scale fisheries difficult and costly (easier and/or more cost-effective at a larger scale).
It is not possible to address all issues, so the processes of risk assessment and prioritisation are critical.	• National Development Strategies. • Sector strategies (fisheries and others). • National Biodiversity Strategy Action Plan (under the Convention on Biological Diversity). • Community management plans. • Protection plans for sharks and other sensitive groups.	• Plans often not implemented. • No prioritisation of coastal management issues by government. • Decisions made primarily on economic development grounds. • Lack of resource allocation.

Working Group Topic 3

What measures need to be implemented before your country can be considered to be fully applying the ecosystem approach to coastal fisheries and aquaculture? (Provide as much specific detail as possible).

Each working group reported the conclusions of its deliberations back to the workshop, again in some cases by presenting specific situations in each country represented in the group, rather than by analysing common themes. A subsequent analysis by the consultant revealed that the most common themes were as follows.

Governance and policy

- harmonise government policy/legislation to improve consistency, clarify overlapping mandates, ensure consistency with international treaties;

- establish high-level, cross-sectoral bodies with strong mandates and leadership to ensure integrated decision-making;
- establish mechanisms to agree on common goals;
- establish integrated coastal management policy and legislation, with long-term horizons and periodic review;
- ensure good recording of decision-making processes so that decisions can be reviewed and understood in the future; and
- apply the precautionary approach.

Legislation and management

- examine legislation to identify and remove impediments to EAFM;
- strengthen environmental impact assessment legislation;
- develop legislation and management plans for aquaculture, which is relatively new in most countries;
- improve enforcement of existing regulations and other management measures — identify and eliminate weaknesses in compliance systems; and
- provide incentives and support to fishery and aquaculture activities that are ecologically sensitive and responsible, and discourage or prevent those that are not.

Stakeholder participation

- establish national stakeholder forums involving government, industry, NGOs, etc. in various sectors;
- establish formal and informal education and awareness-raising programmes at all levels, but especially for communities;
- extend community-based management programmes;
- prioritise locations and areas that are most in need of management attention and/or support; and
- identify alternative income generation activities that provide alternatives to marine resources.

Technical measures

- provide capacity-building to make managers more familiar with how EAFM will affect the way they carry out their activities;
- establish models for EAFM implementation, and determine when these will be of benefit to management and decision-making;
- identify case studies of successful implementation — start with easy ones, then expand or replicate these;
- undertake resource and habitat mapping or characterisation through large-scale assessment tools (e.g. remote sensing, geographic information systems);
- undertake risk assessments to identify key priorities for management research;
- build agency capacity to undertake broader ecosystem assessments and monitoring;
- ensure that monitoring is done at appropriate scales, intervals and degrees of accuracy;
- establish systems to monitor progress, with realistic implementation targets and regular review; and
- identify appropriate, cost-effective ecological, social and economic indicators.

Funding and support

- increase the visibility of EAFM and identify incentives or ways to make EAFM attractive, in order to influence budget and donor processes;
- investigate sustainable financing models;
- impose levies on tourism, fishing, etc. to support EAFM;
- establish funding and technical support partnerships with relevant national and international agencies; and
- use SPC and other regional organisations to help countries meet the additional responsibilities that will flow from the EAFM.

The working groups identified many other issues and made numerous additional comments; many queried whether Pacific Island countries and territories have the human capacity to take on the additional responsibilities that the EAFM requires. The need to generate political will was noted, through the use of valuation of the contribution of coastal and subsistence fisheries to national and local economies, and clear demonstration of the benefits of using EAF. Although fisheries agencies obviously have a part to play in promoting the EAFM, it was not always clear that the fisheries agency should necessarily be the main driver in the process, given that EAFM involves many sectors.

Workshop summary

During the final session, the consultant, Garry Preston, made a presentation that provided participants with a summary of EAFM principles, chal-

lenges, opportunities, areas of compliance and non-compliance, and future requirements, as determined by the working groups and presented above. Mr Preston also presented some views on how fisheries agencies might respond to the challenges that the EAFM presents, by:

- taking a more active advocacy role in promoting inter-agency collaboration and raising official awareness of the impacts that other sectors have on fisheries;
- identifying fisheries where ecosystem impacts can be observed, and improving management of these fisheries;
- considering opportunities for non-extractive use of marine resources, and promoting these where they provide economic benefits as well as clearer compliance with the EAFM;
- considering overall management approaches and trying to set management goals that maximise fishery profitability and ecosystem services, even though this may be at the expense of greater levels of participation in fisheries; and
- promoting customary and traditional systems that allocate marine resource usage rights to a limited numbers of users.

In response to the summary, workshop participants noted that in some countries there are already inter-agency committees or other collaborative mechanisms to discuss multi-sector issues such as climate change. Where they exist, these mechanisms could be adapted to promote collaboration in regard to the EAFM, rather than establishing new mechanisms for this purpose. It was also noted that, as well as promoting inter-agency collaboration at the national level, there was a need for better coordination of the activities of Pacific regional organisations, as several are involved in issues relating to the EAFM.

It was noted that the application of the EAFM does not necessarily involve any new activities or directions. The EAFM can largely be implemented if fisheries agencies ensure that consideration of environmental, social and economic issues is integrated into the fishery decision-making process. Rather than waiting for multi-sector approaches to become effective, a good approach is to address fishery issues first, while also attempting to broaden the stakeholder base to include other sectors. Fisheries managers will always have to deal with uncertainty, but risk assessment can reduce the likelihood that poor decisions are made. Countries were advised to take the initiative of determining their own priorities and presenting these to donors and partner agencies, rather than letting others set the agenda for funding and technical support interventions.

The upstream (impacts of other sectors on fisheries) and downstream (impact of fisheries on other sectors) aspects of the EAFM were discussed. It was noted that a recent SPC questionnaire survey among fishery managers had identified sewage pollution as a more important issue than overfishing. Garbage disposal and siltation were also noted as being significant issues in many localities. Environmental impact assessments of new projects can help mitigate their impacts, but do little to alleviate existing problems. Examples were given of mitigation options for sewage pollution, which ranged from the very costly treatment of centralised sewage processing facilities, to the cheaper, low-technology approach of mangrove replanting by coastal communities.

The question was raised whether MPAs and restocking of reefs with juveniles of important fishery species were useful approaches to management. Mr Preston responded that both approaches could be useful fishery management tools, but neither would solve fishery management problems on their own. MPAs can provide refugia for animals of reproductive age, but the overspill and recruitment benefits of these to the broader fishery have yet to be quantified, and management of fisheries outside MPAs is still necessary. As regards reef reseeding, this may be valuable in specialised situations, such as restoring depleted stocks or populating areas that are devoid of suitable habitat for juveniles. However, if restocking is not done within a management framework, then fisheries productivity, yields and profitability may continue to be held down to sub-optimal levels, and the government may find itself in a costly open-ended commitment to continue financing restocking programmes. Other participants expressed the view that, despite these reservations, MPAs and reseeding programmes raise awareness and have a positive impact on attitudes toward marine resource management; they suggested it is better to establish MPAs than to do nothing.

Follow-up activities

The workshop chair advised the meeting of SPC's future plans to promote the EAFM after the conclusion of the present workshop. The SPC–TNC study referred to earlier is expected to produce the following outputs over the next few months:

- a review of the current status of EAFM in the region (the EAFM questionnaires that

have now been completed by all SPC member countries will contribute greatly to this work);

- a proposed strategy for EAFM implementation (a draft of this document will be distributed widely in the region and among workshop participants to maximise comment and input from all stakeholders before the document is finalised);
- a discussion paper for the CROP Marine Sector Working Group (based on the outcomes from the proposed strategy document); and
- an information brochure on EAFM.

The substantive outputs of the study (in draft form) have been presented to the special Heads of Fisheries meeting to be convened in Apia, Samoa from 11–13 February 2008, with completion of all outputs scheduled for the end of March 2008.

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Secretariat of the Pacific Community, Marine Resources Division, Information Section,
BP D5, 98848 Noumea Cedex, New Caledonia
Telephone: +687 262000; Fax: +687 263818; cfpinfo@spc.int; http://www.spc.int/coastfish