

DEVELOPING AN ECOSYSTEM-BASED APPROACH FOR MANAGING OCEAN ACTIVITIES

Outcomes from the Workshop on "Ecosystem Based Management of Ocean Activities", Cairns, Australia, June 2003

Summary

This report identifies actions which would facilitate the use of ecosystem based management (EBM) for ocean activities in domestic, regional and international marine waters. The report includes a list of challenges to the use of EBM for ocean activities, and measures to overcome these challenges.

The report is based on group and plenary discussions from the Workshop on "Ecosystem Based Management of Ocean Activities", held in Cairns, Australia, 20 June 2003 and includes some discussion of underpinning theoretical work. The report also provides background information on relevant international Conventions and describes the elements and principles underpinning an ecosystem-based approach.

Workshop on "Ecosystem Based Management of Ocean Activities"

The Workshop was convened as a forum for a multidisciplinary group of approximately 150 government officials, technical experts and stakeholders to examine the challenges and potential solutions to using EBM for ocean activities. Australia resourced and facilitated the Workshop as a contribution to developing approaches on EBM for ocean activities, particularly in response to the 2002 APEC Oceans Ministerial Declaration to develop "a shared understanding of the concepts and practice underpinning the ecosystem-based approach to management".

It was the first international meeting to address the cross-sectoral and cross-jurisdictional challenges that are inherent in achieving an ecosystem-based approach to oceans management if ecological sustainability is to be achieved. The main goal of the Workshop was to identify actions to assist the use of an ecosystem-based management approach for ocean activities. The participants were not representing formal government positions.

The Workshop comprised presentations from technical and regional experts on experiences and case studies in EBM; discussion groups on challenges for EBM; and an expert panel discussion followed by a summary of outcomes by the Chair. A full agenda for the Workshop is attached.

The Workshop followed a three day Workshop on the Governance of High Seas Biodiversity Conservation which specifically addressed the World Summit on Sustainable Development (WSSD) Plan of Implementation call to 'maintain the productivity and biodiversity of important and vulnerable marine and coastal areas...beyond national jurisdiction'.

Introduction

With an international history dating back to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR)¹, the concept of an ecosystem-based approach to natural resource management gained widespread international acceptance at the Earth Summit in Rio in 1992, and became an underpinning concept of the subsequent Convention on Biological Diversity (CBD). Through the CBD, an ecosystem-based approach is described as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”². It is seen as a way to achieve the Convention’s three objectives of conservation, sustainable use and the equitable sharing of resources.

Since the Earth Summit and the first conference of parties to the CBD, the term “Ecosystem-based approach” and related concepts (such as ecosystem based management, integrated marine and coastal area management, and sustainable forest management) have appeared in many international and regional fora. Internationally the most significant progress in implementing an ecosystem-based approach in the marine environment has occurred within the fishing sector.

Following the successful inclusion of an ecosystem-based and precautionary approach in the work of CCAMLR, the concept was incorporated into the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean and the 1995 UN Fish Stock Assessment. In the past three years an ecosystem approach to fisheries management has been considered at an international level through the 2001 Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem and the subsequent 2003 FAO Technical Guidelines on *The ecosystem approach to fisheries*³. While this sectoral-focused work has contributed to international, regional and domestic fisheries management, as a single-sector approach it cannot provide a comprehensive ecosystem-based management approach. It cannot cover the full range of human activities within an ecosystem and does not account for the potentially cumulative and additive impacts that result from both fishing and non-fishing activities.

The Cairns EBM Workshop was the first international workshop to incorporate cross-sectoral and cross-jurisdictional integration into the concept of an ecosystem-based approach for oceans management. Underpinning the Workshop was the concept that, if ecosystem integrity is to be maintained using an ecosystem-based approach, all sectors and jurisdictions must cooperate and coordinate to ensure that their activities are managed sustainably – individually and collectively. Without integration between sectors and across jurisdictions, the capacity for an ecosystem-based approach to achieve ecological sustainability within that ecosystem is compromised.

¹ Article 2, Convention on the Conservation of Antarctic Marine Living Resources (1982)

² Decision 6, 5th Conference of Parties to the Convention on Biological Diversity (2000)

³ FAO Fisheries Department, (2003) *The ecosystem-based approach to fisheries, FAO Technical Guidelines for Responsible Fisheries*, No. 4 Suppl. 2, Rome.

Without integration ecosystem boundaries may not be acknowledged, best available information will not be shared and the risks posed by cumulative and additive impacts will not be recognised. This also has major implications for guaranteeing the sustainability of any particular resource.

While the Workshop was inspired by the APEC Oceans Ministerial Declaration to develop “a shared understanding of the concepts and practice underpinning the ecosystem-based approach to management”⁴, challenges and solutions identified during the Workshop could apply across the international, regional and domestic levels of governance and research. However, reflecting the APEC Oceans mandate, the regional and domestic examples featured in this report focus on the Asia-Pacific region.

Elements of an Ecosystem-based approach

Healthy marine ecosystems are essential for the long-term productivity and diversity of marine industries. An ecosystem-based approach makes maintaining the structure and function of ecosystems a fundamental goal of management, recognising the interdependence of human uses and ecosystem health. It is a management approach for human activities which recognises ecosystem boundaries, rather than simply using lines based on governance or tenure.

In a marine context, ecosystem-based management aims to ensure that human activities do not impede the maintenance of: ecological processes; marine biological diversity; and viable populations of all native marine species in functioning biological communities.

In the international oceans context, an ecosystem-based approach is widely used to describe an approach to managing human activities within ecosystem boundaries in an integrated manner to achieve ecological sustainability. An ecosystem-based approach is a precautionary⁵ and actively adaptive feedback management approach, in recognition of our limited knowledge of marine ecosystems and their dynamic nature.

At the Workshop participants were interested in discussing operational issues relevant to an ecosystem-based approach. To allow the Workshop to progress effectively, the discussions were based on an ecosystem-based approach built on four simple principles derived and adapted from existing international and regional fora.

These principles are:

- **Ecosystem integrity:**
a primary focus on maintaining ecosystem structure and function, including a recognition that ecosystems are dynamic, changing and sometimes poorly understood (therefore requiring precautionary⁶ decision-making);
- **Human uses and values:**

⁴ APEC Oceans Ministerial Declaration (2002) Korea

⁵ Precaution – As per Rio Principle 15

⁶ As per Rio Principle 15

- recognition that human knowledge (including scientific and traditional), uses and values are central to management;
- Active adaptive feedback management: planned, pro-active management that responds to changing conditions through feedback management and embodies the principles of performance assessment using indicators and continuous improvement; and
- Participation: recognition that stakeholder participation is a key to successful management.

Existing instruments for implementing an ecosystem-based approach

An ecosystem-based approach is broadly accommodated within the mandate of many international and regional Conventions covering the marine jurisdiction. Some of these highlight or establish an international legal basis for such an approach.

- The Law of the Sea Convention requires States to consider the interdependence of fish stocks, the effects of fishing on species associated with harvested species, and to take measures to preserve and protect rare and fragile ecosystems and the habitat of threatened or endangered species and other forms of marine life. In 1999 the UN established an informal consultative process on oceans and Law of the Sea, which has promoted to the UN General Assembly the requirement for an integrated, ecosystem-based approach to management for the world's oceans.

- Principle 7 of the Rio Declaration states that countries should cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the earth's ecosystems. The adoption of *Agenda 21* provided for the management of the ecosystem as an entirety, including biotic and abiotic components. *Chapter 17 of Agenda 21* calls for coastal states to commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction. In order to conserve the use of marine living resources in the high seas, States are also encouraged to take into account the relationships among species and relevant environmental and economic factors.

- Under the FAO's Code of Conduct for Responsible Fisheries States are encouraged to conserve the biodiversity of aquatic habitats and ecosystems, taking into account the fragility of coastal ecosystems and integrated use of resources, and ensuring that conservation measures are applied to both target species and species belonging to the same ecosystem or associated with the target species. The UN *Fish Stocks Agreement* also requires the adoption of conservation and management measures for species belonging to the same ecosystem or associated with the target stocks.

- The Convention on Biological Diversity (CBD) considers that an ecosystem-based approach is the primary framework for the implementation of the Convention. Parties to the CBD have formulated and agreed the broad conceptual basis for the application of an ecosystem-based approach with practical guidance for its application. Through the CBD, Parties agreed on a

program of action to implement the convention. The Jakarta Mandate on Marine and Coastal Biodiversity aims to assist this implementation by focusing on integrated marine and coastal area management, the sustainable use of living resources, protected areas, mariculture and alien species.

- The UNEP Regional Seas Programme aims to address environmental problems in the management of marine and coastal areas. The regional institutions which have been established under this programme adopt the principle of integrated management, with most also addressing transboundary issues through an ecosystem-based approach.

- In the Asia-Pacific region, the 2002 APEC Oceans Ministerial Declaration included a resolution to develop “a shared understanding of the concepts and practice underpinning the ecosystem-based approach to management” at both the domestic and regional levels.

- Many regional fisheries organisations have adopted an ecosystem approach to management (such as CCAMLR). Some of measures adopted by these regional institutions include the consideration of the interdependence of fish stocks, protection of the biodiversity of the marine environment, and the impacts of human activities on marine ecosystems.

The implementation of an ecosystem-based approach is facilitated by these international, regional and domestic laws and agreements dealing with the sustainable management of ocean resources.

However, an inherent challenge in effectively applying these agreements for ecosystem-based oceans management is that most established ocean areas are managed according to politically defined boundaries that do not match ecosystem boundaries. The most desirable condition is where the spatial extent of a managed area fully coincides with the spatial extent of an ocean ecosystem or set of contiguous ecosystems. For example, while the Law of the Sea Convention acknowledges that “the problems of ocean space are closely related and need to be considered as a whole”, the legal boundaries set for maritime zones do not coincide with ecosystem boundaries. This inconsistency provides the challenge to ocean users and managers to ensure that ocean activities are managed across jurisdictional boundaries to achieve sustainable ecosystems into the future.

Facilitating an EBM approach

Following the presentations, Workshop participants discussed the broad challenges to using an ecosystem-based approach to management, and identified five priority areas where changes in philosophies or practices are required in the short to medium term. These priorities defined as: moving from definitions to management, capacity building, institutional coordination and cooperation, managing science and information, and participation were reinforced during the panel discussion. For each of the priorities participants identified key means to advance ecosystem-based management.

a. Moving from definitions to management

There are a number of international Conventions using and promoting an ecosystem-based approach to the management of human activities within the marine environment. Between Conventions there is variation in definitions and in the principles and elements of an EBM approach, and the scale of “ecosystems” to which the principles are being applied. In practice, an ecosystem-based approach can be effectively applied at a range of scales.

A fundamental concern is the confusion that can arise between a genuine ecosystem-based approach, where human activities are managed within an ecosystem in order to achieve ecological sustainability, and ecosystem manipulation where the ecosystem itself is the focus of management in order to maximise the availability of a resource for human consumption.

A suggestion for dealing with these issues was to develop a cross-sectoral *Code of Conduct* for an ecosystem-based approach within a coordinating body such as UNICPOLOS.

The four simple principles used at the Workshop reflected the desire of participants to move beyond definitional debates, and consider the management and operational objectives required to improve the implementation of an ecosystem-based approach in order to achieve ecological sustainability for oceans uses.

To move to adaptive feedback management, indicators should be developed in relation to management objectives so appropriate baselines and management options can be ascertained. Some participants saw an ecosystem-based approach aligning human institutions in a horizontal, inclusive and holistic manner. While an ecosystem-based approach was seen as a complex concept, it was recognised that ecosystem considerations are already often implicit in management decisions.

One challenge for management is the lack of consistency between ecological and jurisdictional boundaries. However, where ecosystems cross political boundaries the absence of full participation of jurisdictions should not be seen as a reason for avoiding use of an ecosystem-based approach. For example, where management is restricted to jurisdictional areas, an ecosystem-based approach can be started within that portion of the ecosystem which falls within the jurisdiction. Over time other jurisdictions can be encouraged to join the management approach. Consideration should also be given to enforcement measures, particularly in larger and cross-jurisdictional ecosystems.

Means to develop a successful management approach:

- i. Encourage and harness political will for sustainable ocean outcomes
- ii. Integrate governance – sectoral and jurisdictional approaches and models
- iii. Clearly articulate objectives and indicators
- iv. Develop practical actions in priority areas
- v. Provide transparent decision making

- vi. Keep the approach simple
- vii. Use clear principles and best practice tools, as available
- viii. Promote successes
- ix. Develop a cross-sectoral *Code of Conduct for An Ecosystem-based approach to management*

b. Capacity Building

Sharing knowledge and information is crucial in building the capacity of all States to effectively manage their resources and protect the marine environment. There is a particular need for capacity building in developing nations to deliver an ecosystem-based approach. This should include consideration of what is needed to develop alternative livelihoods and other long-term solutions.

Some participants noted that ecosystem-based approaches needed to contribute, either directly or indirectly, to the eradication of poverty if such an approach was to be embraced by developing States. Capacity building, particularly in developing countries, should be encouraged and supported, including their participation in developing ecosystem based maritime regimes and in adopting ecosystem-based management to protect and conserve the natural resources in the marine environment.

For meaningful progress to be made there is a need to share both positive and negative experiences, and move capacity building from “training” to “doing”. Capacity building also needs to fit the context of particular countries and economic situations. Therefore, the form and content of capacity building should be applicable to the area where the approach is to be applied.

Increased awareness and information sharing is likely to lead to better informed and transparent decision-making. While the aim from an ecosystem-based approach is to optimise outcomes for all, participants were clear that in reality there are often greater benefits for certain groups depending on the situation. An ecosystem-based approach requires honesty regarding who is bearing the costs and who is benefiting. Regardless of benefits and costs, participants noted that there were overarching benefits for all user groups including certainty for future planning and usage and ecosystem sustainability.

In the case of trans-boundary ecosystem issues, the equitable sharing of resources and social justice were raised. Some participants considered that there was a dichotomy between developed and developing countries, and economic benefit derived from marine resources. Where regional oceans are threatened by cumulative impacts from different nations, equity issues may drive the management approach. For example, where countries equitably share resources, they may be more likely to cooperate on cumulative impact management.

Some participants noted a need to develop community-based performance assessment and monitoring modules, and for States to share information on these modules. Access to funding was also recognised as a potential

limitation to implementing an ecosystem-based approach, particularly in developing States. Participants noted that capacity building needs to be long term, and targeted (with funding and training) to ensure it achieves the most productive result. The idea of developing a “virtual” demonstration site for EBM was raised.

Means to improve capacity building

- i. Increase information sharing
- ii. Improve cooperation and joint effort between States and within States
- iii. Mobilise resources to assist developing countries
- iv. Provide economic incentives
- v. Consider political and legal sanctions if required
- vi. Cultivate a climate conducive to change
- vii. Consider a statutory framework as required

c. Institutional Coordination and Cooperation

As international and domestic legal arrangements establish jurisdictional boundaries that do not correlate with ecosystem boundaries, there was recognition among participants that an ecosystem-based approach could therefore only be effective when applied in an integrated manner.

There is often little or no integration across sectoral management agencies, with inconsistent legal instruments, definitions, methods and assessment criteria applied in different sectors. There is a need to enhance the capacity of existing international and regional organisations and the capacity of national governments, to ensure that coordination and cooperation occurs in the management of marine ecosystems.

There is also limited coordination and cooperation between international, regional and domestic instruments which promote an ecosystem-based approach for the management of marine activities (such as CBD, FAO, APEC, CCAMLR and UNEP). While participants recognised that international meetings, such as the United Nations *Informal Consultative Process on Oceans and Law of the Sea (UNICPOLOS)*, aimed to achieve coordination and cooperation at the international level, practical measures were still required at all levels.

Regional organisations could be provided with a broad direction for improving the accessibility and functionality of an ecosystem-based approach by developing a process or strategy for implementation or operation. For example, in the Asia-Pacific region, APEC working groups may be in a position to develop such a strategy to guide regional and domestic marine organisations in the area. Existing regional bodies or organisations should also adopt (wherever possible) an ecosystem-based approach within their policies and programmes. This will result in a more comprehensive approach to the management of regional ecosystems and will help avoid duplication of efforts among states and regional bodies.

There is also a requirement for frameworks or mechanisms to support integrated oceans management. Mechanisms should include consideration of community-based, government and institutionally driven ecosystem-based approaches. One participant noted that improved coordination was required at the regional level, particularly between regional fisheries organisations and regional seas programmes (noting it may be possible for these organisations to start formally or informally reporting together to achieve 'regional oceans management'). Aiming for consistent policies among littoral states will assist in the effective management of regional oceans and seas.

Many participants noted that States should become parties to the relevant international conventions emphasising an ecosystem-based approach. It was noted that informal collaborative mechanisms should be addressed as well as formal integrative measures.

Means to improve institutional coordination and cooperation

- i. Strengthen the capacity of relevant institutions, including developing common goals and partnerships
- ii. Develop and implement practical measures for coordination, such as the Global Marine Assessment, and enhance communication between marine institutions.
- iii. Align jurisdictions and sectors through integrative approaches, such as the UNICPOLOS (international) and APEC (Asia-Pacific region)
- iv. Identify a leading institution or government to progress action
- v. Strengthen the mandate for integration between organisations (eg. request that "Regional Fisheries" and "Regional Seas" programs, formally or informally report together for "Regional Oceans" management)
- vi. Establish pilot programmes to explore the broad applicability of an EBM approach at different geographic scales and across a range of socio-economic circumstances.

d. Managing science and Information

By definition, an ecosystem-based approach is applied using a precautionary⁷ approach, based on existing information. This reflects that the knowledge base for marine ecosystems is generally limited, although participants noted that some areas were more data and information rich than others.

Some nations cannot afford to conduct complex scientific studies that are being applied in developed countries to establish the management needs for the impact of human activities on an ecosystem. While scientific collaboration on marine research has been occurring between some States, there is a requirement for greater information sharing between and within States. For example, on the domestic level data on ocean processes is often split between marine agencies, and intellectual property considerations can prevent adequate information sharing.

⁷ Rio Principle 15

Participants considered that improved collaborative opportunities are required for science at all levels of governance. At the international level existing opportunities were identified, such as the Census of Marine Life, the broader UN Global Marine Assessment, and Marine Science and Technology Centres which are currently being considered under the Law of the Sea Convention. For example, if developed, Marine Science and Technology Centres could be expanded to include an ecosystem-based approach.

There was general agreement among participants that stronger links were required between oceans science and oceans stewardship, noting that an ecosystem-based approach for oceans would also include the impacts from land-based activities. With an ecosystem-based approach, connectivity is implicit – water quality affects coastal development, fisheries effects and is affected by tourism. One concept that deals explicitly with this issue is the Marine Catchment Basin (the MCB), which is an ecosystem-based approach that integrates the management of terrestrial catchment basin with the management of coastal ecosystem.⁸ MCB recognises the impacts of land-based pollution and degradation as integral to integrated ecosystem management. There are other relevant national approaches to integration that should be shared.

In many States, the science of an ecosystem-based approach is not adequately linked or aligned with the decision-making governance body. While it was acknowledged that managers needed to clarify their objectives, there was also a call for science to start aligning more closely with these objectives. One example of successful policy and management driven approaches was the Caribbean Large Marine Ecosystem project, where scientific input followed management direction.

Scientific training and education was also seen as an under-utilised opportunity to influence a broader and more integrated “big picture” approach to research. Australia’s Regional Marine Planning model was presented as an example of marine science research aligning with management objectives.

Participants noted a current weakness within sectoral scientific approaches as the tendency to discard information that does not fit the scientific model of choice rather than adjusting the model. This was particularly in relation to fisheries stock assessment models. Participants emphasised that management driven research may ensure that models are adjusted and adapted over time, using available management tools. Some tools for integrated, ecosystem management that were discussed at the Workshop include agreements between Parties (eg. Memorandum of Understanding), permits, zoning plans, policies, site regulations and site management, with clear evaluation and an auditable trail.

Participants noted the connectivity of environment, social, cultural and economic issues, noting that an ecosystem-based approach (as defined at the Workshop) challenges traditional economic-driven management practices.

⁸ Garcia and Hayashi, 466.

Some participants considered an ecosystem-based approach was an effective method to elevate environmental values in the decision-making process. The new standards for economic reporting, such as triple bottom line reporting, were considered advantageous for an ecosystem-based approach. However, some participants stressed that it was not necessary to consider balancing economic and environmental factors as an ecosystem-based approach underpins long-term economic sustainability.

In light of often limited information, the scientific world also needs to incorporate more traditional community information (sharing) in order to arrive at “real world” solutions based on the best available science. There is often a failure to consider traditional management practices when developing technical tools (such as risk assessment strategies), although traditional management approaches can be effectively utilised alongside scientific models. While acknowledging gaps, the ecosystem-based approach provides for decisions and action based on all existing information, and this has been effectively applied in some international conventions such as CCAMLR.

Some participants noted that science must be seen as a stakeholder, as well as a service provider.

Means to improve scientific and information management

- i. Use “Best available science”/risk based/adaptive/systems approaches
- ii. Formally recognise the role of traditional management regimes
- iii. Establish public and private partnerships
- iv. Increase scientific education across sectors and disciplines
- v. Educate scientists in systems approaches and the application of relevant science
- vi. Clarify ecological and socio-economic research actions to inform management decisions
- vii. Avoid “quick fixes” and make use of proven strategies
- viii. Recognise multiple and often competing uses and cumulative impacts, and manage risks in an adaptive and integrated way.

e. Participation

Participation is a fundamental principle of an ecosystem-based approach which recognises that stakeholder input and information should be valued and acknowledged. While stakeholder participation was discussed as an essential mechanism to achieve balanced outcomes, some participants noted that stakeholders also needed to collaborate in the decision making process (not just informing it), with decision making devolved to the most appropriate level. In some cases, co-management is appropriate, with delegated management and decision-making power. Ensuring that all relevant stakeholders participate ensures a high level of compliance.

The process of participation was considered to be a discipline in itself, incorporating experts, skills, knowledge and methodologies across science, management and technology. Some participants also noted the requirement

to include land managers in the management process, given the potential impact of land activities on the oceans. There is also an important role for traditional owners and community groups. Stakeholders were identified as an important group in the enforcement process, with examples given by Australia in relation to marine protected areas and enforcement within some sectors.

Means to improve participation

- i. Engage stakeholders and community in process and include in solutions
- ii. Use culturally appropriate decision support systems that ensure stakeholder confidence
- iii. Include cultural and social justice considerations
- iv. Engage stakeholders in co-management arrangements where possible
- v. Devolve decision making where appropriate

Conclusion

Russell Reichelt closed the session noting Murray Gel-Mann's observation in his book "*The Quark and the Jaguar*" that ecosystems are among the most complex systems in the universe and we should not expect simple solutions and high predictability. EBM is an approach to management which aims to facilitate ecological sustainability in the face of this complexity and uncertainty.

In EBM we have a risk-based approach to management which requires thought and actions for long-term goals, often in the absence of perfect knowledge. If we increase the level of coordination and cooperation between government and other stakeholders, we increase the sense of common goals and the purpose of management actions become more transparent, more widely accepted and more likely to succeed. When institutional arrangements become more tightly aligned, the entire system is easier to understand. If we increase our ability to accept change, and adapt our practices over time, the EBM approach becomes less worrisome to stakeholders.

Researchers can also benefit from, and participate in, this process. The EBM approach should help stakeholders reach consensus on identifying the most important problems demanding research attention. By aligning research and management, we can also begin to address cross-sectoral and cross-jurisdictional issues in a transparent manner with user-driven research.

In summary, an integrated ecosystem-based approach is clearly a valid approach for managing human activities in the world's oceans in order to achieve ecological sustainability. Key philosophies and practices to facilitate the use of this approach include:

- clearly identifying and articulating operational and management objectives,
- building capacity within and between States,

- improving cross-sectoral, cross-jurisdictional and cross-institutional cooperation and coordination,
- increasing the relevance of scientific research and ensuring the science effort matches the objectives, and
- engaging stakeholders to ensure full participation and (where relevant) co-management.