

Segment 1- Demystifying the concept and understanding its implications

Implementing the ecosystem approach: the importance of analyzing stakeholders and their interests

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There is evidence that the status of resources and the biodiversity of the world's oceans and coastal areas continue to decline as a consequence of uncoordinated and unsustainable human action. By putting humans and their uses of space and resources at the heart of the decision-making process, the ecosystem approach recognizes humans' responsibility while at the same time providing them with the opportunity to find better management solutions. An ecosystem approach calls for a comprehensive look at all dimensions of the problem, and for finding sound solutions based on coordinated action of society, at different levels and scales; such solutions may imply trade-offs, but will benefit all in the longer term.

Especially exploitation of resources in marine areas beyond the limits of national jurisdiction continues to increase, and the management of these resources is made more complicated by the lack of information on stakeholders, their actions and their interests, due to the out-of-reach nature of the area. Such a gap needs to be filled, if a meaningful debate on implementing the ecosystem approach to oceans is to take place and informed decisions are to be made.

Many different 'ecosystem approaches' exist. The *CBD ecosystem approach* (developed in the context of the Convention on Biological Diversity (CBD)), the *ecosystem approach to fisheries* (EAF) and *integrated marine and coastal area management* (IMCAM) (or alternatively, 'integrated coastal area management' or 'integrated coastal zone management' – terms that are relatively equivalent, differing in the amount of coastal or marine environment covered) represent three useful tools for making progress towards a more integrated and holistic management of ocean spaces and resources.

A basic premise of the ecosystem approach is that there is no 'correct' way to implement it, but that certain principles and guidance should apply. The goals pursued by different existing ecosystem approaches are consistent with each other, and the principles, guidelines and other guidance on implementing them complementary. However, we are now at a stage when the ecosystem approach needs to be brought beyond the general level of implementation allowed by its principles and guidance. To this end, concrete tools must be identified and applied so as to make the ecosystem approach a reality.

Valuable experience has been gained in implementing ecosystem approaches in the coastal waters of the world. Work aimed at identifying and analyzing stakeholders and their interests in these areas during the past decade and even in terrestrial areas since the 1970s has proven highly successful to mitigate and even anticipate conflicts over different uses of space and resources and thereby enhancing the actual operationalization of the ecosystem approach.

Most of the goals, principles and guidance within existing ecosystem approaches can be extended to open ocean and deep sea environments, as the ecosystem approach is not bound to jurisdictional limits, but rather informed by a mixture of ecological boundaries, spatial and temporal information on stakeholder uses, jurisdictional delimitations, and a range of special management measures. Moreover, within all the three above-mentioned ecosystem approaches, experiences have demonstrated that integration among sectoral policies can be complementary to the reinforcement of individual sectors.

However, the real challenge today lies not only in integrating the various management approaches into a comprehensive and cohesive plan with the ecosystem approach as its central framework; but, more urgently, in unveiling individuals, groups or organizations who are in one way or another interested, involved or affected (positively or negatively) by a particular project or action toward space and resource use. This is particularly true for open ocean and deep sea environments – areas which are increasingly recognized as important for the earth's economic and environmental balance and survival – and also for the oceans as whole.

Abstract for UNICPOLOS Discussion Panel “Ecosystem approaches and Oceans”

Demystifying the concept and understanding its implications

WWF

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Over the past 50 years, most efforts to regulate fishing and conserve our oceans have had limited success in preventing over-fishing, degradation of the marine environment, and irreversible loss of marine biodiversity. Ecosystem-Based Management (EBM) of the oceans is an approach that is likely to succeed where many other initiatives have failed, because of its focus on managing human issues and impacts in order to achieve the maintenance of biodiversity. Fishing is an important use of the world’s oceans, but the concept of EBM for marine capture fisheries has not been clear or fully operational. WWF has a comprehensive Policy Framework⁵ designed to inform global debate and providing a workable approach for individual fisheries in a manner consistent with integrating global and regional policy initiatives into national activities.

Many different ways to refer to the idea of EBM of fisheries have successfully entered the politically correct scientific/managerial jargon⁶ however, this apparent triumph conceals a bitter reality: the lack of a scientific and political consensus on the conceptual basis and limits of EBM, and the unavailability of an agreed operational framework generating clear rules for its practical implementation. Defining reference levels for fisheries management, based on indicators of overall ecosystem structure and functioning, and followed by the establishment of thresholds for overfishing an ecosystem, is crucial, to prove that EBM is much more than an appealing concept. This scientific advance must accompany the development of effective management approaches and operational tools (the EBM ‘tool kit’) as well as political understanding of the nuances (and their operational effects) in the terminology employed by different stakeholders. These interrelated processes are key to the delivery of a truly functional approach that at its core enables society to continue to derive services from healthy functioning marine ecosystems.

Should the story of EBM become that of an interesting debate but a failed approach; the risk of a complete failure in ocean health and productivity is real. Our society, as users of the global marine resources, cannot afford a failure of EBM given the cumulative scientific evidence on the degraded state of marine ecosystems and the way this compromises the future of the world’s food supplies.

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⁵ *Policy Proposals and Operational Guidance for Ecosystem-Based Management of Marine Capture Fisheries*. (2002). Ward, T., Tarte, T., Hegerl, E. and Short, K. WWF, Sydney, Australia. pp80.

⁶ *Paradigm shifts, gaps, inertia, and political agendas in ecosystem-based fisheries management* (2005). Marine Ecology Progress Series 300: 241-296., Politics and socio-economics of ecosystem-based management of marine resources

Top 10 Myths Concerning Ecosystem Approaches to Ocean Resource Management

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Abstract

Ecosystem approaches to ocean management are advocated to address continuing problems concerning the status of living marine resources. While comprehensive approaches to management appear to be desirable, there are concerns about expanding or combining institutional focus to address interactions among specific interest sectors (fishing, energy development, tourism) that use particular ecosystems. This paper outlines ten common misperceptions regarding an ecosystem approach to management (EAM) of ocean resources, many of which are often cited as reasons for not pursuing integrated management. Ecosystem approaches *are* adequately defined in terms of their institutional requirements, the use of scientific information to inform decision making, and the expected benefits to society resulting from their use. Ecosystem approaches are being accepted and used more frequently as the basis for problem solving, and ‘best practices’ are now emerging as a basis for successful EAM implementation.

Why do I criticize MSY theory in ecosystem approach?

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Ecosystems, including those that contain fisheries resources, are characterized by uncertainty, dynamic properties, complexity and evolutionary responses of the component species. However, the classical maximum sustainable yield (MSY) theory does not include any of these (Matsuda & Abrams 2004). Thus, it is perhaps not surprising that the MSY theory and its derivatives have not worked for ecosystem fisheries management. Therefore, we said goodbye to traditional MSY theory (Matsuda & Abrams in press). The MSY theory does not guarantee coexistence of all species in the food web (Matsuda & Abrams 2006). In addition, some may expect feedback control in fishing pressure as a robust strategy for management with uncertain, dynamic and complex ecosystems. However, feedback fisheries management does not always work for complex ecosystems. We investigate the effects of species interactions on sustainable yield from an exploited multispecies communities. We consider the consequences of feedback control in fishing effort. If the prey species is exploited, increasing fishing effort decreases the predator abundance more than the prey abundance. Feedback control of fishing effort may cause extinction of the predator, even if the fishing effort is well controlled. We recommend monitoring not only the target stock level but also any other indicator of the \square gentire \square h ecosystem. I propose the following principles: (1) do not catch fishes that are at low stock levels; (2) do not catch immature fishes but catch adult fishes; (3) catch fishes that are temporally dominant; (4) in order to achieve these three principles, improve the technology for selective fishing; (5) monitor not only a target species, but its prey and predator and the ecosystem (Matsuda & Abrams in press).

[References]

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Segment 2- Moving to Implementation: Implications for enabling elements

Science advice supporting implementation

Dr. Jake Rice, Dept of Fisheries and Oceans, Canada

This talk focuses on the science advisory elements supporting implementation of an ecosystem approach to management of human activities in the sea. It will consider three different areas of particular concern for implementation. The first is definition of the correct task; the second the preparedness of science to advise on different aspects of implementing an ecosystem approach; and the third, the culture of seeking and using science advice in management of different human activities in the sea.

Without denigrating the importance of integrated management and inclusive governance, if jurisdictions are seriously interested in making human activities in the sea sustainable from an ecosystem context, then there are benefits to focusing specifically on the management of each activity in a broad ecosystem context. Implementing an ecosystem approach to managing human activities in the sea will require building a culture of asking the right questions at the right time in policy development. It also requires building a culture among the science advisors of making the most of what is known, while take adequate protection against the risks posed by what isn't known. Anyone experienced in the provision of science advice to diverse clients is familiar with how different the advisory cultures are between advisors and managers focused on activities that primarily impact populations than those focused on activities that primarily affect environmental quality and habitats. A move to an ecosystem approach will require these two cultures to merge – even before an ecosystem approach grows into integrated management.

The ecosystem approach to fisheries: on the way to implementation¹

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Summary

The Ecosystem Approach to Fisheries (EAF) was adopted in FAO in 2003, following the 2001 Reykjavik Conference. Within the overall policy framework of the Code of Conduct for Responsible Fisheries (CCRF), the EAF technical guidelines, published in 2003, together with other CCRF guiding documents on fisheries management, sustainability indicators, precautionary approach, ecolabelling, etc., provide a very substantial amount of support to EAF implementation.

FAO has contributed at to the implementation effort during the last 5 years (and indeed since the adoption of the CCRF in 1995) at global, regional and national levels, promoting international collaboration, elaborating and promoting international plans of action, producing guidelines, undertaking detailed scientific studies (e.g., on sea birds, turtles, criteria for CITES listings, deep sea governance, etc.), executing field projects at global regional and national levels, developing information networks and advocating EAF in regional fishery bodies. In the process as well as in the process of implementation of related frameworks (e.g., on sustainable livelihoods, ecologically sustainable development, precautionary approach) a number of lessons were learned.

The main implementation challenges relate to, *inter alia*, preparedness, system boundaries, implementation capacity, policy alignment, EAF bureaucratic mainstreaming, updating of legislations and regulations, integration of sectors, administrations and scientific disciplines, organizing effective participation, mobilizing sufficient scientific support, and, last but not least, mobilizing real political commitment.

Some of the key implementation issues relate to the development of a culture of risk analysis and management, the development of relevant indicators within adequate policy frameworks, and the adaptation of conventional fishery science to sustainability science in order to deal properly with uncertainty, the development of an integrated assessment paradigm, process and tool-box.

It is concluded that much more effort is needed, particularly at regional and national levels, with strong support to developing countries and poor communities, if EAF is to be something else than a new form of rhetoric posturing in front of the perennial problem of unsustainable natural renewable resources use.

¹ Summary of a presentation to the Informal Consultative Process on Oceans and the Law of the Sea (ICP), New York, 12-16 June 2006. A full version of the paper will be presented at 30th Virginia Law of the Sea Conference on Law, Science & Ocean Management, organized by the Center for Oceans Law and Policy, University of Virginia, Dublin, Ireland, 12th - 14th July 2006.

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**John Richardson, Head, Maritime Policy Task Force, European
Commission**

Ecosystem-based management: from principles to implementation

The EU context

- The Thematic Strategy for the Protection and Conservation of the Marine Environment
- The Green Paper on a future Maritime Policy

The ecosystem-based approach: principles and problems

- System complexity
- Shifting baselines
- Diversity of ecosystems
- Multiple human influences
- Fragmented decision-making
- Implementation and monitoring of rules

The way forward

- From piecemeal instruments to integrated arrangements
- Societal agreement on goals
- Integrating best scientific knowledge
- Identifying the ecoregions: science and politics
- Ownership through participation
- Monitoring and enforcement, nationally and internationally

The EU strategy

- Ecosystems as the starting point
- Integrated analysis
- Effective spatial planning
- From words to effective action
- The tools for success

Abstract

The Benguela Current Large Marine Ecosystem Programme – Implementation of an Ecosystem Approach to Ocean Governance

By

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The BCLME Programme is a joint initiative by the governments of Angola, Namibia and South Africa to manage and utilize the resources of the Benguela Current Large Marine Ecosystem in a sustainable and integrated manner. The programme is designed to improve the structures and capacities of the three riparian countries to deal with transboundary management issues in order that the ecosystem can be managed as a whole. The area stretches from Cabinda Province in northern Angola to Port Elizabeth in South Africa and extends from high water mark to the edge of the exclusive economic zones.

The BCLME Programme is a five year programme sponsored by the Global Environment Facility (GEF) which commenced in 2002. It is multi-sectoral involving eight ministries with responsibilities for fisheries, the environment, minerals, mines and petroleum. The operational framework of the BCLME and its activities originated from a comprehensive stakeholders transboundary diagnostic analysis (TDA) which was then formulated into Strategic Action Programme (SAP). Key components of the SAP include joint surveys and assessment of shared fish stocks, harmonising monitoring and management procedures, socio-economic analysis of regional fisheries, assessment of cumulative impacts of seabed mining activities, development of an early warning system for extreme events, harmful algal blooms, oil pollution contingency planning, assessment of vulnerable species and habitats and marine biodiversity conservation. The development and building of capacity throughout the sectors and institutions is a primary objective of the BCLME Programme. Considerable progress has already been made in this area and on increasing awareness amongst scientists and managers on the application of an overall ecosystem approach to resource management and ocean governance..

During the last four years, BCLME has allocated over US\$ 6 million in support of 75 projects and activities in areas of fisheries, productivity, environmental variability, pollution, ecosystem health, socio-economics and governance. The projects are being implemented by a wide variety of clients, including government institutions, UN agencies, universities, private consultancy companies and the regional marine science programme BENEFIT.

One of the most complex and yet successful projects to date has been the development and implementation of an ecosystem approach for fisheries (EAF) management in the

BCLME. This is an on-going joint project with the fisheries institutes of the three countries and FAO that is investigating the existing issues, problems and needs related to EAF and developing different options to achieve sustainable management of the fisheries resources at an ecosystem level.

Building and establishing regional and international partnerships and co-operation has been an important part of the BCLME Programme activities. These include the four other Pan-African LME's (Canary Current, Guinea Current and Aghulas-Somali Current), as well as GOOS-AFRICA, FAO, NOAA, IOC, GLOBEC, BENEFIT and UNEP-GPA Regional Seas. The results of BCLME project activities are contributing directly towards addressing the goals and targets of the WSSD, UNCED, MDG as well as New Partnership for African Development (NEPAD).

The main out come of the BCLME Programme will be the establishment of an Interim Benguela Current Commission (IBCC) which is expected to be formally endorsed by the countries later this year. The IBCC will operate primarily as an advisory body to the governments and will have a Secretariat, an Ecosystem Advisory Committee and various working groups to undertake the technical and scientific assessments. Once operational, the IBCC will require period of institutional strengthening and capacity building before being transformed into a permanent and sustainable Benguela Current Commission (BCC).

**Seventh meeting of the UN Open-ended Informal Consultative Process
on Oceans and the Law of the Sea**

Discussion Panel “Ecosystem approaches and oceans”

Panel Segment 3 – Lessons learned from implementation of ecosystem approaches at the national level in developed States

Lessons from implementation of Ecosystem-based management of the ocean uses in Australia

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This paper has two principal aims. Firstly, to provide an overview of Australian examples of implementation of ecosystem-based management (EBM) across a broad spectrum of marine/ocean environments and institutional contexts. Early examples include the Great Barrier Reef Marine Park and the North West Shelf multiple use study. Australia’s Oceans Policy and significant revision to environmental legislation (the Environmental Protection and Biodiversity Act) have been the major drivers of wider implementation of EBM in Australia over the past decade. A major whole of government initiative towards multiple-use EBM has been the development and implementation of bioregional marine plans for the Australian EEZ and the associated institutional arrangements for inter-governmental, stakeholder and science consultation and decision making. The National Marine Bioregionalisation for the Australian EEZ is a practical example of a key science product that underpins a range of cross-sectoral planning and management activities. Practical examples of sectoral initiatives include the development and implementation of an Ecological Risk Assessments (ERA) for assessing the impacts of fishing on the broader marine environment and Ecologically Sustainable Development Framework for fisheries at a national level, and the ongoing implementation of the National system of Representative Marine Protected Areas. It is hoped that this necessarily brief overview will provide an entry point for policy makers, managers, researchers and stakeholders to initiate dialogue with the practitioners involved and explore for themselves operational issues that have arisen, the particular lessons learned and the solutions developed to that the next step in the transition to EBM.

The second aim is to proffer some considered views on general issues for advancing the implementation of ecosystems-based management in the oceans, gained from this experience, to stimulate debate and focus discussion on practical next steps in broader implementation of the approach. While the particular details vary among case studies, key ingredients to successful implementation include: i) Sustained political and institutional will to act, including the willingness to make the first practical steps and recognise the need to do so without full knowledge or certainty of outcomes, ii) Clarity of vision and demarcation of responsibilities for strategic policy direction and operational planning and management, particularly at a sectoral level, iii) Recognising and respecting competing objectives among sectors and looking for creative solutions, iv) A focus on outcome-based performance, v) The importance of an ecological

spatial framework that has scientific credibility and a strong conceptual foundation to provide a direct translation from science to planning and management, vi) The need to balance the strong influence of “iconic” places, features, species with the broader requirement for representativeness and assessment of ecological impacts, and vii) The persuasiveness of binding instruments. Each of these issues will be important, to differing degrees, in the continued implementation of EBM in Australia and elsewhere. However, it is contended that i) and vii) have been the determining factors in the progress that has been made in Australia.

“A Practical Approach to Ecosystem-Based Management”
Segment 3A: Lessons Learned from implementation of ecosystem approaches at the national level in developed States

A conceptual framework has been developed to guide the national application of an ecosystem based approach to oceans management and Canada is implementing this approach in five large ocean management areas. This discussion will focus on the framework, the tools developed to advance its implementation, the caveats and lessons learned to date. One of the over-riding considerations in regards to Canada’s approach to oceans management is maintenance of ecosystem health with a focus on objective-based decision making. Ecosystem objectives address the ecosystem structure, function and physical-chemical properties of the system.

Canada’s approach to oceans management is also area-based with marine areas within Canada’s jurisdiction delineated into “eco-regions” within which larger scale ocean management planning areas and smaller coastal planning units are nested. For an ecosystem-based approach to be relevant and effective, two complementary approaches have been developed and are being tested. The bottom-up (activity-based) approach involves establishing ecosystem-based objectives based on a review of the activities which may have a significant impact on specific ecosystem properties or components. The ‘top-down’ (ecosystem-property-based) approach is based on the identification of the key ecosystem properties and components without prior consideration of human activities that may be impacting on the system. Combination of the two approaches joins the rigour of the scientific process with the identification of meaningful management measures that can be readily understood by stakeholders.

In order to be effective application of an ecosystem-based approach to management requires good, although not perfect science. More importantly the scientific analysis and advice needs to be cross disciplinary, over different time and spatial scales. It can not be just a scientific exercise but must result in the identification of changed management decisions and governance processes. Clearly the starting point needs to be the use of all of the available knowledge for the planning area, and its interpretation within a risk management framework. Identification and addressing of key information gaps should occur as time and resources permit, as the concept of adaptive management and precaution work hand in hand with an ecosystem-based management approach.

Any discussions respecting the development of a collaborative international Ecosystem Based Management Framework or Plan should rely on the collation and interpretation of the international body of science for a specific planning area combined with a review of the activities which may be impacting on that ecosystem. Existing international scientific advisory bodies and existing governance mechanisms offer a very good starting point for implementation of EBM in international waters. The development of a conceptual framework for EBM would guide the implementation and testing of approaches which are underway in various jurisdiction, and would facilitate (and make less costly) the wider dissemination of this approach.

The Norwegian ecosystem-based management plan for the Barents Sea and sea areas off the Lofoten Islands

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Abstract

In April 2006 the Norwegian government launched a White paper on a new, integrated management plan for the Norwegian part of the Barents Sea. This paper is currently debated in parliament, and will form the basis for an integrated and ecosystem-based management plan of the area. The plan proposes an ecologically viable balance between the use of marine resources (renewable and non-renewable) and the need for safeguarding the production potential and health state of the marine ecosystem.

The management plan is based on an assessment of the current and future impact on the ecosystem of human activities, and analyses on interactions between human activities, deficits in current knowledge of the state and dynamics of the ecosystem. To monitor the overall development and “health-state” of the Barents Sea a set of indicators with associated environmental quality objectives have been developed.

The plan provides overall guidelines for management of all human activities (oil and gas industry, fishing and shipping) in the area in order to ensure the continued health, production and function of the Barents Sea ecosystem. The main aim of the plan is to maintain a good state of the marine environment at the same time as allowing for sustainable use of marine resources. These goals are in general more ambitious than the goals stated in Norway’s general environmental policy.

Area based management is at the core of the plan, identifying particularly valuable and vulnerable areas, either from ecological and/or human perspectives. In the different areas access for different human activities is carefully managed; eg. by seeking IMO permission for defined shipping lanes 35nm offshore, limiting trawling in sensitive areas and not opening some particularly valuable and vulnerable areas to petroleum activities.

To face the many serious challenges to the future state of the marine environment several new management measures are proposed. These cover the management of all human activities in the ecosystem, from measures to prevent IUU fishing, reduce pollution levels, increase preventive measures and emergency response systems for acute oil pollution, reinforce efforts to safeguarding biodiversity. To ensure an effective practical integrated management the plan proposes several ways to strengthen and improve cooperation between relevant authorities, both for the annual follow-up of the state of the environment, but also for the revisions of the plan (every 3-4 years).

The management plan stresses the need for continued and expanded international cooperation on ecosystem-based management of the Barents sea, and on global issues of concern, like pollution.

Ecosystem-based fisheries management in Iceland Implementation and practical considerations

by

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Abstract

Managers and fisheries scientists providing advice have for many years discussed and argued definitions of ecosystem-based approach to marine fisheries. This concept has been on the agenda of international fora in recent years and on several occasions dedicated international conferences and symposia have been held. The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem, held in 2001 addressed the scope of the concept and subsequently the FAO produced basic guidelines for implementation. As a follow-up, various fora have devoted immense efforts to define indicators and scientific criteria to be applied. Despite all the efforts, we still do not move very fast towards implementation and there is even some misconception as to what this is about.

The Reykjavik Conference concluded that there was no reason to wait, since many of the measures that are being implemented under single-species management schemes are in the spirit of ecosystem-based fisheries management. We need simply do it better. Also it was stressed that although a fully fledged ecosystem-based management scheme of the ocean resources is the ultimate goal, it needs to be understood that in order to achieve this we may have to undergo a lengthy incremental process. But it is urgent to start now.

In this presentation, some examples are given as to how such concept has been exercised in Iceland under the single-species scheme. While it is important to study and define criteria under the scope of holistic view of the marine ecosystem in its greatest complexity, a more simple approach may provide some steps forward. An inventory for mapping various relevant aspects while conducting single-species assessment of fish stocks, for scientists involved, is suggested. The presentation will report on this pragmatic approach, involving inventory of assessment methods and basis for scientific advice, the effects of fishery on discards of target and non-target species, the effects of fishery on the physical environment and certain ecosystem components, multispecies considerations and the effects of environmental changes on the target stocks. Such inventory is meant to help scientists to focus on aspects that are relevant in this context, to help identify gaps and research needs, and to draw attention of all stakeholders to these factors. Later it may contribute to a more holistic ecosystem approach to the management of the fisheries and other ocean resources.

Ecosystem approach in the research and management Of the Chilean fisheries

by

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The research for the management of the Chilean fisheries has been funded by two sources: Fondo de Investigación Pesquera (FIP) and the Undersecretariat of Fisheries. Although Chile has not incorporated explicitly the ecosystem approach in the fisheries management, the concept has been introduced in a practical form through specific research projects, and regulations for the conservation of the stocks and the protection of the biodiversity.

In this sense and nevertheless the principal focus of interest of the fishing research in Chile has been monospecific, in the last 12 years an important amount of information has been produced that allowed a substantial improvement in the knowledge on topics referred to bio-diversity the same as to the ecological relations between the species of interest. Stand as sources of information for this purpose: the programs of scientific observers, programs of monitoring of the national fisheries and the programs of surveys to assess the main fish stocks. On the other hand studies identified by FIP have been developed to obtain information and to describe the ecotrophics interactions between species, emphasizing for example age specific relations of predation by the southern hake (*Merluccius australis*) on the hoki (*Macroronus magellanicus*), which allowed to formulate a multispecific stock assessment model for the southern hake.

It is necessary to highlight also the permanent interest of the State to reduce the effects of fishing in secondary species, standing out two important Plans of Action in process of public consultation: the protection plan of sharks in the swordfish fishery, and the protection plan of sea birds in longline fisheries to reduce the incidental mortality. Chile has also impelled policies to protect biodiversity via the creation of marine protected areas, creating in fact 3 Marine Protected Areas and has participated together with Peru in the development of a proposal for the integrated management of the Humboldt Large Marine Ecosystem, with the support of the Global Environmental Fund (GEF) and UNDP.

In terms of applications of methodologies, it is necessary to emphasize the work done by scientist of the Universidad de Concepción, Chile, in the use of trophic dynamics models (Ecopath / Ecosim) in order to describe the abundance in pelagic fish stocks such as anchovy (*Engraulis ringens*) and common sardine (*Strangomera bentinki*), and some demersal resources such as the common hake (*Merluccius gayi*) and the squat lobster (*Pleuroncodes monodon*). In terms of the formulation of models with ecological considerations for fisheries management, IFOP implemented during 2005 a Bayesian stock assessment model for the common hake and his trophic interaction with the Humboldt giant squid (*Dosidicus gigas*). The application of this model permitted to recommend a total allowable catch for the year 2006, representing another clear example of ecosystem approach in fisheries management in Chile.

The challenge of Chile is to impel the development of research programs to allow for a gradual development of an ecosystem management approach for their fisheries.

Summary: Concerns and measures for implementing ecosystem approaches in the Guinean coastal zone

Terrestrial and particularly coastal ecosystems undergo since long time many types of pressures (population, economic activities, pollution) which has nowadays put the protection of nature as a central point of international meetings and discussions.

Drastic diminutions of renewable resources which are vital for humankind encouraged to develop new tools to understand the dynamic of ecosystems functioning. The results of ecosystems modelisation (Ecopath + Ecosim), which are not discussed here recommended to consider ecosystems and their exploitation (resources, physical milieu and Humankind) as a whole.

Fisheries manager and specialist could not realize this earlier. The Lack of data of good quality, the non sufficient understanding of the dynamic of interactions between populations, ecosystems and fisheries might be the reason. For the first time, it is the Code of Conduct for responsible fisheries (FAO, 1995) that explicitly recommended the ecosystem approach in fisheries, even if the earlier International Sea Law Convention (UN, 1982) and the CBD had diverse dispositions about interdependency between targeted species with other marine organisms and their dependency towards the environment.

The present work focusses on west-african marine fisheries as one of the main coastal economic activities. At national level, the guinean coastal and marine area, the ecosystem approach conducted to some types of "delimitations" or even access limitation and to the idea of integrated coastal and marine zone conservation.

The guinean fisheries case study is interesting in this way. Within 20 years (1985 – 2003), the demersal fish abundance in the Guinean EEZ decreased to the rate of 40 to 70 %, while the fishing effort increased 30 to 60 % in the same period. During this period, *Pseudotolithus elongatus*, a Scianidae in Guinea, very interesting for the corean market, revealed a decrease from 40 kg/ 30 min. to 10 kg/ 30 min. during scientific Trawl surveys.

Through the lack of coherent and well monitored management plans, the implementation of the 6 coastal Ramsar sites in 1992/ 1993 in the guinean coastal zone could not reduce this strong pressure, mostly coming from the for Guinea difficult to survey industrial fishery

With the ending project, Ecologic Fishing in Guinea, financed by the EU, the ecosystem approach in Guinea has been encouraged in 2002 with the implementation of marine protected areas as integrated coastal conservation zones with the implication of the residential communities in the management of these sites.

The success hypothesis is illustrated with the guinean coastal Ramsar sites for halieutic resources and key habitats protection and sustainable utilization.

Key words: environment, ecosystems, coastal zone, fisheries, Ramsar sites, marine protected area.

Micronesian Sea Traditions - Palau's Marine Protected Areas
Mr. Noah Idechong, Delegate, House of Delegates, Palau

Surrounded by water, Palauans have developed a life which is inextricably linked with the oceans. We derive food, identity and traditions from our relationship with the ocean. The long standing success of this symbiotic relationship is based on responsibility that each Palauan is taught from childhood that they are caretakers of the sea.

Prior to the El Nino event which killed much of our soft and hard coral, Palau had been unexposed to such wide spread devastation. Seeing the corals die, knowing that we could not stop it made many Palauans want to give up their role as caretaker. We were on the verge of losing heart, especially since once the corals died many of the fish also left, and with them a great deal of our livelihood. This was a clear example of the dramatic effect that a small change in a single part of the ecosystem can have a cascading effect on all other parts. However, we went back to our roots and saw building on traditional approaches with modern scientific advances as the way forward to crafting effective measures to save our oceans.

Palau's practical experience with the ecosystem approach extends back thousands of years. The traditional practice of *bul* is an important example. *Bul* involves the Council of Chiefs placing reef areas off limits to fishing during known fish spawning and feeding periods. This respects vulnerabilities in the ecosystem while ensuring that there will be robust fish to catch during other times of the year.

This traditional *bul* system has become the basis for Palau's network of protected areas and its new Protected Area Network (PAN) law. Micronesia is home to most of the world's coral biodiversity -- Palau alone has 1300 species of fish and 700 species of corals across its islands. Few know these species and waters as well as the Palauan fishermen who have grown up in them. The importance of local perspective thus is self-evident when considering what areas to set aside.

Palau has 21 nationally-designated protected areas and intends to add more. The PAN law looks first to local leaders and their traditional guidance, and then to scientists, to identify vulnerable ecosystems and coordinate the community, national, and international assistance necessary to institute appropriate protection.

The PAN law is intended not only to respect local ecosystems and meet Palau's commitments under the Convention on Biodiversity (CBD), but is also serving as a model for MPAs across Micronesia. The Secretary-General has reported that small island developing states (SIDS) have among the lowest percentage of areas set aside for conservation and that this seriously threatens their ability to meet Millennium sustainable development goals. This is not the case though in Micronesia where Palau's President Tommy E. Remengesau Jr., in partnership with The Nature Conservancy, has formed a challenge to the World to follow Micronesia's example of setting aside 30% of nearshore marine, and 20% of forest ecosystems for conservation by 2010. Although the focus of these protected areas is decidedly local, we simply cannot achieve these goals without international assistance.

Palau is also using lessons learned about ecosystem vulnerabilities at the local level to protect itself from threats arising beyond its jurisdiction. Palau is working closely with scientists to find ways to protect its coral reefs from bleaching by global climate change. And while there is much about the deep sea that we do not know, we know enough to understand that everything is connected and that, if left unchecked, it is only a matter of time before the destructiveness of

bottom trawling is felt in concrete ways. Palau has banned all bottom trawling within its waters and by any Palauan or Palauan company anywhere in the world. Palauan law also obligates Palau to seek an interim prohibition on unregulated bottom trawling in international waters. Much like the rationale behind the *bul* system, this law seeks to protect deep sea fish when they aggregate around seamounts for breeding and feeding, and are thus most vulnerable.

In Palau it is more than just a saying, “we do not inherit the earth from our parents, we borrow it from our children,” it is a deeply held belief. And the Pacific philosophy that the oceans unite us rather than divide us is one which we hope will be borne out in our interactions in the United Nations in the days to come as we seek real solutions for protecting this most precious of resources.

Résumé : Approche écosystémique en Guinée : Démarches et enjeux

Les écosystèmes terrestres et surtout côtiers subissent de nos jours diverses formes de pression et d'exploitation (population, activités économiques diverses, pollution) qui font de la problématique de la protection de l'environnement un point central des préoccupations nationales et internationales.

La diminution dramatique des ressources renouvelables vitales pour l'homme a conduit alors au développement récent d'outils de compréhension de la dynamique de fonctionnement des écosystèmes. Les résultats des travaux de modélisation écosystémique (Ecopath + Ecosim) qui ne sont pas discutés ici ont recommandé de considérer l'environnement et son exploitation (ressources, milieu physique et Homme) comme un tout.

D'ailleurs, les gestionnaires des pêches et les spécialistes des pêches ont été lents à réagir à l'évidence croissante que l'écosystème doit être pris dans son ensemble. Le manque de données pertinentes de bonne qualité, l'insuffisante compréhension de la dynamique et des interactions des populations, des écosystèmes et des pêches et l'absence d'un autre mode opérationnel d'aménagement crédible en seraient la cause. Il faudra ainsi attendre le Code de conduite pour une pêche responsable adopté par les Membres de la FAO en novembre 1995, pour voir apparaître explicitement les principes d'une approche écosystémique à l'égard de la pêche. Pourtant la Convention des Nations Unies sur le droit de la mer de décembre 1982 et la Convention sur la Diversité Biologique comprenaient déjà diverses dispositions qui établissent l'interdépendance des espèces cibles avec les autres organismes marins et leur dépendance à l'égard de l'environnement.

Le présent travail concerne d'abord l'exemple des pêcheries maritimes comme l'une des principales activités économiques de la zone côtière ouest-africaine. Appliquée ensuite à la zone côtière guinéenne, la notion d'approche écosystémique a conduit à des formes de « délimitation » ou de limitation d'accès et par extension à la notion de zones de conservation côtière intégrée.

Le cas du secteur de la pêche est très révélateur à ce sujet. Un suivi de l'abondance des poissons démersaux et de l'effort de pêche industrielle et artisanale dans la ZEE guinéenne a montré, entre 1985 et 2003, des diminutions de l'ordre de 40 à 70 % de l'abondance, diminutions directement liées à 30 à 60 % d'augmentation de l'effort de pêche. Rapporté à l'écosystème dans sa globalité, l'une des plus importantes espèces halieutiques *Pseudotolithus elongatus*, un scianidae appelé boboe en Guinée où il représente une ressource très sollicitée au regard de son prix sur le marché asiatique, a connu une importante réduction de stock dans la même période, avec des abondances actuelles de moins de 10 kg/ 30 minutes de trait de chalutage scientifique contre 40 kg/ 30 minutes il y a environ 20 ans.

Par manque de plans d'aménagement cohérents et bien suivis, la mise en place de 6 sites Ramsar côtiers en 1992/ 1993 dans la zone côtière et maritime guinéenne n'avait pu réduire cette forte pression de pêche, principalement industrielle et pour laquelle la Guinée manque de moyens suffisants de surveillance et de contrôle.

C'est à cet effet qu'à la fin du Projet Pêche Ecologique en Guinée (PEG), mis en œuvre sur financement européen, l'approche écosystémique a été encouragée dès 2002 par la création d'aires marines protégées comme zones de conservation côtière intégrée qui implique les populations résidentes dans la gestion participative de ces aires.

L'hypothèse de réussite est illustrée à travers les sites Ramsar côtiers pour la conservation et l'exploitation durable des ressources halieutiques ainsi que la protection des habitats clefs.

Mots-clefs : environnement, écosystèmes, zone côtière, pêche, sites Ramsar, aire marine protégée

International implementation of the ecosystem approach to achieve the conservation of Antarctic marine living resources

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ABSTRACT

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), which held its first meeting in 1982, was the first international organisation charged with achieving an ecosystem approach to the conservation of exploited stocks, notably krill, as well as the conservation of the wider ecosystem. Since its beginning, the Commission has evolved from (i) initially reacting to over-exploitation of stocks, a situation largely inherited from previously unregulated fisheries prior to the Convention, to (ii) establishing the precautionary approach for new and developing fisheries, as well as (iii) establishing a process for implementing an ecosystem-approach, including monitoring and assessments that take account of the ecosystem requirements. The evolution of the Commission and its Scientific Committee over its first twenty five years provides a strong lesson in what can and cannot be achieved using different management approaches both in terms of how a governing commission can effectively use the best scientific evidence available and what is diplomatically achievable in a regional commission.

CCAMLR has been successful in implementing its ecosystem approach because of the emphasis on the conservation of the marine ecosystem and only permitting rational utilisation of marine living resources in the region. Whales and seals are excluded from consideration by CCAMLR except as they may be impacted by fisheries.

In the first instance, CCAMLR only reacted to the need for management measures (conservation measures) once there was demonstrable proof, i.e. consensus in the Scientific Committee, that those measures were needed. This method was recognised to fail in the late 1980s following difficulties in curbing fishing activities until stocks were obviously depleted. A second phase began in the late 1980s with the introduction of the precautionary approach that achieves scientific consensus on conservation measures, notably catch limits, before problems arise. An important component of

this phase was to interpret the ecosystem objectives of the Convention in population and ecosystem quantities that could be defined and measured scientifically. In so doing, the new methods used to assess catch limits were designed to take account of scientific uncertainties and estimate the likelihood of achieving the population and ecosystem objectives of the Convention given a specific harvest strategy, which at present is total allowable catch. Approaches to new and exploratory fisheries were also developed that restrict harvesting until such time as sufficient data are available to properly assess whether a harvest strategy would be consistent with the objectives of CCAMLR. In most cases, the Commission has specified, in conservation measures, the data required to be collected from the fisheries to facilitate assessments in the future. This is achieved primarily through the annual submission of catch and effort data, and through the CCAMLR Scheme of Scientific Observation, which requires 100% coverage on finfish vessels to obtain suitable data.

The third phase has been the implementation of compliance and enforcement measures, such as vessel monitoring systems, catch documentation schemes and Port and Flag State controls. These developments have almost completed an internationally coordinated management system from data acquisition, assessments, and harvest controls to compliance and enforcement. Current work is adding to the means by which conservation objectives will be met for predators of krill as well as for investigating and implementing further compliance and enforcement activities, further reducing bycatch and examining the use of area management and other tools to minimise the impacts of fishing and to conserve biodiversity.

CCAMLR has established almost all the mechanisms necessary for the effective administration of fisheries and conservation activities. However, despite the strong will of the Members of CCAMLR to achieve the objectives of the Convention, the Commission will fall short of that goal if full international cooperation is not achieved. In terms of regional cooperation, CCAMLR needs complementary binding regional arrangements in areas to the north of CCAMLR in which Antarctic marine living resources are found in order to achieve the conservation objectives for those taxa, such as toothfish and especially seabirds, notably albatrosses. More importantly, cooperation from all States with an interest in conservation and utilisation of high seas resources needs to be achieved. At present, any State can choose not to become a party to CCAMLR but still allow their flag vessels to fish in CCAMLR waters as unregulated fishers; such activities are also often illegal and unreported. This common practice seriously threatens the CCAMLR's ability to achieve its conservation and rational use objectives. Mechanisms are needed to ensure that States are obliged to only allow their vessels to fish in the region if that State is a Party to CCAMLR and participates fully in the activities and obligations of the Commission, including contributing to the costs of managing fishing.

Abstract

Regional Cooperation in Ecosystem-based Management in the Seas of East Asia: The Partnership Approach

By

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PEMSEA is a regional project of the Global Environmental Facility. It has been operating since 1994 focusing on building intergovernmental, interagency and multi-sectoral partnerships for the sustainable development of the Seas of East Asia. PEMSEA is participated by 15 countries, viz., China, Japan, DPR Korea and RO Korea in the north and the Association of Southeast Nations (ASEAN) in the south covering a total sea area of 7 million km² and total coastline of 234,000 km. The Seas of East Asia are composed of six Large Marine Ecosystems (LMEs) and have major river systems draining into the regional seas with a total combined watershed of 6.25 million km².

PEMSEA has adopted the concept of ecosystem-based management in managing the river-basins, estuaries and coastal seas of the region through the application of integrated and adaptive management approaches in addressing pollution, loss of habitats and biodiversity, depletion of fisheries and marine resources, coastal reclamation, and other coastal and marine issues within the confine of the socioeconomic, political, cultural and ecological characteristics of the region. PEMSEA mobilizes the three key sectors of society, viz., government, private and the NGOs, and uses the key dynamics of integrated management towards achieving environmental sustainability.

PEMSEA has set-up a series of Integrated Coastal Management (ICM) demonstration sites to serve as working models for ICM application. Achievements in local actions, such as conflict resolution, improvement of coastal landscape, effective waste management, clean beaches and restoration of habitats, in several ICM demonstration sites in the region create confidence and capacity in coastal management and thereby generate more interests among local governments in replication and scaling up. 27 local governments in nine countries have set-up and sustained ICM programmes using their own financial resources. Efforts are now being made to scale up ICM practices in 20% of the regional coastline by 2017. A PEMSEA Network of Local Governments (PNLG) has been established with one of them (Xiamen, China) hosting the regional secretariat and an annual event on the "International Forum on Sustainable Coastal Cities" during "World Ocean Week".

Based on the experience of local ICM implementation, management efforts have extended beyond administrative boundaries, within or outside national jurisdiction. A subregional agreement between Cambodia, Thailand and Vietnam for oil and chemical spills response and cooperation in the Gulf of Thailand is now in operation with appropriate private sector groups involved in oil spill training and exercise. In Manila Bay, Philippines, political commitments at the national and provincial levels have been forged through the Manila Bay Declaration to implement the Manila Bay Coastal Strategy,

especially recent actions to develop coordinating mechanisms for the management of Laguna de Bay, Pasig River and Manila Bay. In Bohai Sea, the inner sea of China, cooperation among 3 provinces and two cities has been promoted through the Bohai Sea Declaration and the implementation of the Bohai Sea Management Strategies. Appropriate legislation on Bohai Sea Management has been tabled at the National Assembly.

With the development and endorsement of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), the countries of the region have now moved forward to implement a common regional marine strategy that responds to WSSD, UNCED, MDG as well as to several ocean-related declarations, such as the Seoul Declaration of the APEC Ocean Related Ministers, the Putrajaya Declaration and concerned strategy and action plans. A follow-up project proposal for SDS-SEA implementation is being developed following the approval of the GEF-PDF B grant.

PEMSEA is now undergoing transformation to institutionalize its current project-based operation into a longer term PEMSEA Resource Facility (PRF), which provides secretariat and technical services to participating countries. China, Japan and RO Korea will provide annual cash contributions while the Philippines will continue hosting the Regional Programme Office. In addition to the PRF, the regional mechanism includes: (a) a Partnership Council composed of governments and partnering stakeholders; (b) a partnership fund to receive contributions and donations; (c) a tri-annual EAS Congress featuring a Ministerial Forum and an international conference for reviewing progress on SDS-SEA implementation at national and local levels, exchange of experiences and information and providing opportunity for interaction between decision makers and the stakeholders; and (d) a state of the coasts report for reviewing progress made in the region with respect to coastal and ocean governance. Effective implementation of the SDS-SEA will certainly create stronger cooperation and collaboration among various coastal and ocean management initiatives, including regional and international organizations in fulfilling their ocean-related mandates as well as strengthening individual management efforts in the six large marine ecosystems of the region.