# Ecosystem approach



## DEFINITION

A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. An ecosystem approach is based on the application of appropriate scientific methods, focused on levels of biological organization that encompass the essential structure, processes, functions and interactions among and between organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.

CBD (2004)[1]

## NOTES ON DEFINITION

There are a number of definitions for ecosystem approach, further complicated by the existence of two other similar terms: Ecosystem-based management and ecosystem management. There are only minor differences between most of the operative components of each of the three terms, and as a result the definitions could be considered equivalent. The Convention on Biological Diversity (CBD) guidelines consider ecosystem based management to be a supporting concept to the ecosystem approach [2]. In addition, it has been demonstrated that the terms ecosystem management and ecosystem-based management have been used more or less interchangeably [3]. Further to this, the Food and Agriculture Organization's (FAO) work on the "Ecosystem-based Management of Fisheries" draws heavily on the Convention on Biological Diversity's ecosystem approach [4] as does the United Nations Environment Programme's implementation of ecosystem management [5].

There are a number of key components that consistently appear in these related definitions. Almost all definitions refer to the idea of protecting or conserving the environment. There is also a heavy emphasis on scientific information being used in 'systems thinking' (i.e. understanding that management of an area must take into account the multiple, complex interactions that occur within it), and 'sustainable use' (assessing an appropriate level of consumption of ecosystem services that does not endanger the health of the ecosystem). In addition, the human or societal component of the system is recognised as essential to consider when implementing management.

**Explanatory Text from Convention on Biological Diversity**

*"Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention; conservation, sustainable use and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems."*

Convention on Biological Diversity Conference of the Parties 5[1]

**Additional Convention Definition – 'Ecosystem Approach'**

*The comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.*

OSPAR Convention, the Helsinki Convention, and the International Council for the Exploration of the Sea (ICES) [5], [6]

**Scientific Consensus Statement – 'Marine Ecosystem-Based Management'**

*Ecosystem-based management is an integrated approach to management that considers the entire ecosystem, including humans.*

Communication Partnership for Science and the Sea (COMPASS) (2005). A definition signed by more than 200 scientists and ocean and coastal policy experts[8]

**Explanatory Text from COMPASS:**

*"The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors. Specifically, ecosystem-based management:*

- *emphasizes the protection of ecosystem structure, functioning, and key processes;*
- *is place-based in focusing on a specific ecosystem and the range of activities affecting it;*
- *explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;*
- *acknowledges interconnectedness among systems, such as between air, land and sea; and*
- *integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependence."*

COMPASS (2005) Scientific Consensus Statement on Marine Ecosystem-Based Management[8]

**The Ecosystem Approach to Fisheries (EAF)**

*An approach to fisheries management and development that strives to balance diverse societal objectives, by taking into account 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.*

Food and Agriculture Organization of the United Nations (2003) The Ecosystem Approach to Fisheries [9]

Further Explanatory Text from the FAO

*"The purpose of an ecosystem approach to fisheries is to plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from a full range of goods and services provided by marine ecosystems".*

## KEY POINTS

- Ecosystem approach is conceptually similar and therefore currently used in a synonymous way to ecosystem-based management and ecosystem management. Key themes addressed throughout these concepts are: the protection of the environment, systems thinking, spatial scales, sustainable use and the human component.
- The ecosystem approach is the primary framework for action under the CBD. The framework is built on twelve complementary and interlinked principles.
- Integration of the ecosystem approach can occur at international, national and regional level. The method provides an adaptive tool for use at the landscape / seascape scale.
- The ecosystem approach has been criticized for its broadness, making its interpretation and application to specific problem-scenarios challenging. Tools and case studies are being produced by the CBD for guidance.

## INTRODUCTION

The ecosystem approach is primarily concerned with management at a systems level rather than focusing on individual species or habitats. It aims to take into account both the environmental and social contexts and thus provide a more integrated management methodology.

## HISTORY

Ecosystem management as a concept, has been formally around since at least the introduction of conservation ethics by Aldo Leopold in 1966. [9] The CBD definition of the ecosystem approach was developed through a number of workshops and seminars involving scientists and conservationists from around the world between 1995 and 2000 [10]. The ecosystem approach has recently been best integrated into fisheries management. It is included within international European legislative frameworks such as the European Marine Strategy Framework Directive [11]. Here the ecosystem approach is explicitly referred to in the context of adaptive management with the aim of attaining good environmental status in the European Regional Seas. In addition, the concept of an ecosystem approach is included within national level guidelines produced by governments, for example, in the United States of America [12]. The Food and Agriculture Organization of the United Nations (FAO) has been leading globally and has produced technical guidelines [9] which are referenced within many of the national and regional strategies [12, 13].

## CONSENSUS-DRIVEN DEFINITIONS

The CBD definition of ecosystem approach exists within a Multilateral Environmental Agreement (MEA) decision and has therefore gone through a consensus process involving governments in its creation. Another consensus driven process was run by the FAO who initially tried to agree a consensus definition for ecosystem-based Fisheries Management in 2001 but there were issues with adopting the proposed definition related to the relative importance of incorporated environmental, social and economic concerns [9]. They succeeded in adopting a definition for ecosystem Approach to Fisheries (EAF) by the FAO Technical Consultation in 2002. The term “approach” indicates that the concept incorporates ecosystem considerations into more conventional fisheries management and therefore more in line with the breadth of the FAO work [9]. A scientific consensus agreed definition for ecosystem-based management was also led by the Communication Partnership for Science and the Sea (Compass), who coordinated a group of scientists based in institutions in the United States of America, to produce the definition. While not agreed at governmental level in an MEA forum, the consensus statement was signed by over 200 scientists and policy experts [8].

## APPLICATION OF THE ECOSYSTEM APPROACH

The Convention on Biological Diversity provides detailed principles and rationale to articulate the ecosystem approach as defined by the convention [1]. The ecosystem approach is considered to be the primary framework for action under the CBD. The integration of the ecosystem approach has occurred at various levels. For example at an international level, relation to sustainable fisheries, the UN General Assembly encouraged States to apply, by 2010, an ecosystem approach [14]. One key feature of the ecosystem approach is that it is a broader method to the traditional system of site protection. It can be applied to the wider environment regardless of the state of protection and can be used at many scales and takes into account human interactions. Therefore it provides an adaptive tool for use at the landscape and seascape scale. One criticism which has been levied at the ecosystem approach is that it is very challenging to interpret the concept and apply it to specific problem scenarios [10]. The CBD thus continues to produce tools and case studies to aid in the interpretation and applicability of the concept [15].

## REFERENCES & WEBSITE


1. United Nations Environment Programme, Secretariat of the Convention on Biological Diversity (2004) The Ecosystem Approach, (CBD Guidelines) Montreal: Secretariat of the Convention on Biological Diversity 50 p.
2. Leech S, Wiensczyk A, Turner J (2009) Ecosystem management: A practitioners’ guide. BC Journal of Ecosystems and Management 10:1–12
3. UNEP (2001) Ecosystem-based Management of Fisheries: Opportunities and challenges for coordination between marine Regional Fishery Bodies and Regional Seas Conventions. UNEP Regional Seas Reports and Studies No. 175. UNEP, 2001. 52 pp
4. UNEP (2009) Ecosystem management programme: A new approach to sustainability. United Nations Environment Programme, Nairobi, Kenya
5. ICES (2005) ICES Cooperative Research Report no.273 Guidance on the Application of the Ecosystem Approach to Management of Human Activities in the European Marine Environment. International Council for the Exploration of the Sea, Copenhagen, Denmark
6. Secretariat of the Helsinki & OSPAR Commissions (2003) Record of the First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions. Convention on the Protection of the Marine Environment of the Baltic Sea Area & OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Bremen, Germany

7. McLeod KL, Lubchenco J, Palumbi RS, Rosenberg AA (2005) Scientific Consensus Statement on Marine Ecosystem-Based Management. Signed by 221 academic scientists and policy experts with relevant expertise and published by the Communication Partnership for Science and the Sea (COMPASS)
8. FAO (2003) The Ecosystem Approach to Fisheries. FAO Technical Guidelines for Responsible Fisheries, No.4 (Suppl. 2). FAO, Rome, Italy
9. Smith RD, Maltby E (2003) Using the Ecosystem Approach to Implement the Convention on Biological Diversity Key Issues and Case Studies Using the Ecosystem Approach to Implement the Convention on Biological Diversity Key Issues and Case Studies. IUCN, Gland, Switzerland
10. European Union (2008) Directive 2008/56/EC establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive). OJ L/164
11. Holliday MC, Gautam AB (eds) (2005) Developing Regional Marine Ecosystem Approaches to Management. NOAA, Maryland, USA
12. Garcia S, Cochrane K (2005) Ecosystem approach to fisheries: a review of implementation guidelines. ICES Journal of Marine Science 62:311–318
13. UN General Assembly Secretariat (2008) Resolution 62/177. A/RES/62/177. United Nations General Assembly, Brussels, Belgium
14. CBD Secretariat (2012) CBD Ecosystem Approach. In: CBD Website.

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Page last updated 3 August 2023