

Ecosystem Services and Biodiversity

Context

The concept of ecosystem services is becoming popular as a way to encourage discussion about the dependence of people on nature and what this means both socially and economically. An environment rich in biodiversity and ecosystem services ensures our continual capacity for sustainable economic activity, nurturing of human welfare, and adaptation to change. Changes in ecosystem services affect livelihoods, income, and local migration and may even cause social conflicts. Nevertheless, ecosystems continue declining worldwide. This is largely due to the unawareness of their value as well as inadequate social and economic incentive mechanisms for maintaining them.

What are ecosystem services?

Ecosystem services are defined as the services provided by the natural environment that benefit people. While there is no single, agreed method of categorizing all ecosystem services, the Millennium Ecosystem Assessment (MA) framework is widely accepted and seen as a useful starting point (see figure below):

What is the link between ecosystem services and biodiversity?

Biodiversity and ecosystems are closely related concepts. There is significant evidence on the linkages between changes in biodiversity and the ways in which ecosystems function. Biodiversity is the foundation of ecosystem services. The different levels (genes, species, ecosystems) and aspects of biodiversity (elements, structures and processes) contribute directly and indirectly to ecosystem goods and services. For example, the decomposition process which relies on the participation of a variety of microorganisms is essential to nutrient cycling, a supporting service.

Loss of species, changes in biotic interactions between species, and introduction of alien species can all interrupt ecosystem processes, and thus have an effect on ecosystem services. Biodiversity is considered to have insurance value by providing resilience in the face of current or future shocks to ecosystems and the services they provide. Biodiversity is especially important pertaining to ensuring adaptation options related to climate change. However, understanding of the detailed interactions between biodiversity and ecosystem services is still evolving.

Key terms

Ecosystem: A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit, and depending on one another. If one part is damaged it can have an impact on the whole system. Humans are an integral part of ecosystems. Ecosystems can be terrestrial or marine, inland or coastal, rural or urban. They can also vary in scale from global to local. Examples of ecosystems include deserts, coral reefs, wetlands, rainforests, boreal forests, grasslands, urban parks and cultivated farmlands.

Biodiversity: The variety of life on earth. The United Nations Convention on Biological Diversity (CBD) defines biological diversity as the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species (genetic diversity), between species and of ecosystems.

Millennium Ecosystem Assessment (MA): A United Nations global study that assessed for the first time the status of a wide range of the world's ecosystem services and the consequences of changes in ecosystems to humankind both now and in the future. The MA which was completed in 2005 concluded that 60% of the ecosystem services it assessed were in decline or threatened.





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Provisioning Services

Products obtained from ecosystems, e.g. food, fibre and fresh water (also known as goods)

Regulating Services

Benefits obtained from the regulation of ecosystem processes, e.g. climate regulation

Cultural Services

Non-material benefits from ecosystems through spiritual enrichment, recreation

Supporting Services

These maintain the conditions for life on earth and are necessary for the delivery of all other ecosystem services, e.g. biomass production, production of atmospheric oxygen, soil formation and retention, water cycling. They differ from all other service categories in that their impacts on people are indirect.

Why are ecosystem services important?

Ecosystem services are crucial to survival and to the social and economic development of human societies. Individuals, rural and urban areas as well as industries rely on the services that ecosystems provide. A classic example highlighting the value of ecosystem services is the dependence on drinking water. Societies spend billions of dollars annually in order to provide clean water to their populations. The value of ecosystem services to people is derived from their role in supporting our lives and our limited ability to replace them with human-engineered alternatives if nature were no longer able to provide them.

Linking biodiversity, ecosystem services and livelihoods: the ecosystem approach

Classical nature conservation methods alone were not enough to halt biodiversity decline and ecosystem degradation. Increasing pressures resulting from population growth, changing diets, urbanisation, climate change, and many other factors call for revised conservation management methods. Above all, people have to be seen as part of the ecosystem, and thus be integrated into conservation approaches.

Based on this notion the Convention on Biological Diversity (CBD) developed the ecosystem approach. It represents a framework for the integrated management of land, water and living resources in a sustainable way.

The Ecosystem Approach recognizes the link between biodiversity, ecosystem services, and livelihoods. It acknowledges the need to understand and manage ecosystems in an economic context. Thereby considering different interests and the need for negotiated and adaptive management based at local levels.

The ecosystem approach seeks to integrate ecosystem services into decision-making by (a) using scientific assessment tools to understand people's dependence and impact on the services provided by ecosystems, and (b) applying policy mechanisms that incorporate ecosystem service values into the decisions made by governments, businesses, NGOs and individuals. The application of the ecosystem approach intends to help in reaching a balance of the three objectives of the CBD: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Further reading:

Convention on Biological Diversity
www.cbd.int/ecosystem

Millennium Ecosystem Assessment
www.millenniumassessment.org

The Economics of Ecosystems and Biodiversity
www.teebweb.org

GIZ (2012): Integrating ecosystem services into development planning. A stepwise approach for practitioners based on the TEEB approach.

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