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Management of Ecosystem: Characteristics, Principle and Importance

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Abstract

Ecosystem management refers to approaches ranging from simply considering the impact of a management decision on other elements of the ecosystem to the simultaneous optimization of management strategies to meet management goals of all elements of an ecosystem. In the present paper management of ecosystem has been discussed in detail along with that its importance and necessities has been highlighted.

Key words: Ecosystem, Pillars, Importance

Introduction

Ecosystems are communities of living organisms along with their physical environment, interacting as a system. Ecosystems are controlled by physical factors such as climate and topography, and internal factors such as disturbance, succession and species. Nutrient cycles and energy flow are what link the physical components of the system with the living part.

Now that we know the definition of an ecosystem, we turn our attention to ecology: the study of relationships between living organisms and their environment. Here are two examples — one of a natural system and the other of an agroecosystem.

Early hunters and gatherers were essentially ecologists in a natural system. Hunters had to know their prey and the prey's use of the environment (habitats), and gatherers had to know their environment to know where to look for food.

In our present-day agroecosystems, farmers and ranchers still need to understand the relationships between the environment and their crops and/or livestock (the living organisms). [1]

Ecosystem management, proposed as the modern and preferred way of managing natural resources and ecosystems, is a bold concept. Articulating a clear definition for ecosystem management seems a reasonable place to start.

- Values and priorities.
- Boundaries.
- Health.
- Stability.
- Diversity.
- Sustainability.

Ecosystem functions are the result of assemblages of plants and animals interacting with each other and with the physical components of their environment.

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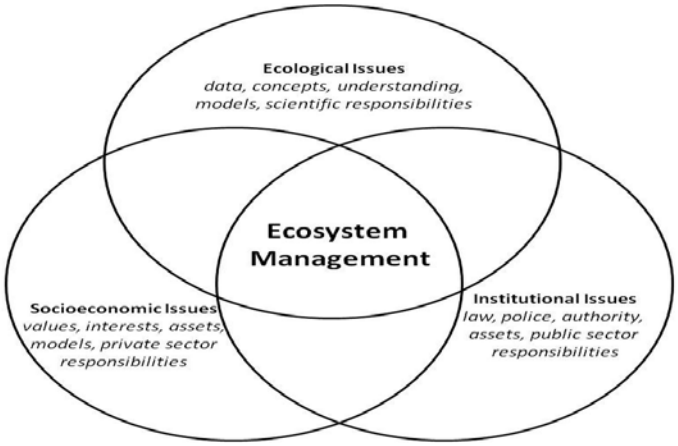

Fig. 1: Parts of Ecosystem Management

Ecosystem-based management attempts to regulate our use of ecosystems so that we can benefit from them while at the same time modifying our impacts on them so that basic ecosystem functions are preserved. Unless essential ecosystem functions are maintained, our use of them will not be sustainable. When this happens, our continued development will be hampered and may even stop. [2]

Characteristics of Ecosystem

Ecosystems are some of the components that constitute the biosphere – the complete assembly of the Earth's ecosystems. Ecosystems also include habitats, places where the plants and animals of an ecosystem live. For example, mussels are usually associated with a rocky shore habitat that is subjected to tidal currents and waves. Pandas live in bamboo forest habitats. Flamingos are usually found in shallow wetland and lake habitats. Wildebeest are found on African grasslands. Very large, easily recognized, groups of ecosystems possessing the same overall general character constitute biomes. Examples are deserts, tundra, evergreen tropical rainforests, boreal coniferous forests, coral reefs and mangroves. [3]

Principles of Ecosystem Management

A fundamental principle of ecosystem management is the long-term sustainability of the production of goods and services by ecosystems as "intergenerational sustainability a precondition for management, not an afterthought". Ideally, there should be clear, publicly-stated goals with respect to future trajectories and behaviors of the system being managed. Other important requirements include a sound ecological understanding of the system, including connectedness, ecological dynamics, and the context in which the system is embedded. Core principles and common themes of ecosystem management: [4-5]

Systems thinking: Management has a holistic perspective, instead of focusing on a particular level of biological hierarchy in an ecosystem (e.g., only conserving a specific species; only preserving ecosystem functioning).

Ecological boundaries: Ecological boundaries are clearly and formally defined, and management is place-based and may require working across political or administrative boundaries.

Ecological integrity: Management is focused on maintaining or reintroducing native biological diversity, and on preserving natural disturbance regimes and other key processes that sustain resilience.

Data collection: Broad ecological research and data collection is needed to inform effective management (e.g., species diversity, habitat types, disturbance regimes, etc.).

Monitoring: The impacts of management methods are tracked, allowing for their outcomes to be evaluated and modified, if needed.

Adaptive management: Management is an iterative process in which methods are continuously reevaluated as new scientific knowledge is gained.

Interagency cooperation: As ecological boundaries often cross administrative boundaries, management requires cooperation among a range of agencies and private stakeholders.

Organizational change: Successful implementation of management requires shifts in the structure and operation of land management agencies.

Humans and nature: Nature and people are intrinsically linked, and humans shape, and are shaped by, ecological processes.

Values: Humans play a key role in guiding management goals, which reflect a stage in the continuing evolution of social values and priorities.

Management of Ecosystem

The management and protection of ecosystems is essential for the functioning of ecosphere processes and for the wellbeing of the biotic and abiotic components of the Earth. Attempts to manage and protect ecosystems and biodiversity range over a variety of scales. [6-7]

- **Ecosphere:** Protocol on global greenhouse emissions
- **Ecosystems:** Management of the Park
- **Communities:** Establishment of a park
- **Population:** Culling park
- **Organism:** Preservation

Importance of Ecosystem

- Maintenance of genetic diversity
- Utility values
- Intrinsic values
- Heritage value
- Need to allow natural change proceed

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