

Marine and Coastal Aquatic Environment in the Livelihood Aspects

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SUMMARY

Aquatic ecosystems cover more than seventy percent of Earth's surface. They are a dominant feature of earth and support a rich diversity of organisms ranging from giant whales to tiny bacteria and algae. These ecosystems exhibit a complexity of interactions among their physical, chemical and biological components which in turn support an appreciable diversity of organisms. Apart from providing many ecological services like food in the form of animal and plant protein, recharge of ground water aquifers, drinking water, irrigation water, recreational and aesthetic services; aquatic ecosystems also produce valuable products that have a crucial role in providing livelihood to several millions of people across the world. Thus, integrity of aquatic ecosystems is a paramount factor in sustaining the livelihood of millions of farmers and fishers. A higher level of aquatic diversity results in greater food and livelihood security of the people.

INTRODUCTION

Coastal and marine ecosystems are among the most productive as well as most fragile ecosystems in the world. These ecosystems play a crucial role in providing food, water, timber, fiber, minerals and pharmaceuticals etc. which support livelihood of millions of people inhabiting coastal areas. Food in the form of fish and other edible plants/animals is one of the most important products of the coastal and marine ecosystems which provide a range of livelihood options to the communities engaged in fisheries, aquaculture and allied activities. The estuaries, mangroves, lagoons, sea grasses and kelp ecosystems in marine and coastal areas provide a wide range of ecological services viz. regulation of climate, floods, diseases, wastes and water quality, soil formation, photosynthesis, nutrient cycling etc. There are also many supporting services such as recreational, aesthetic, transport and spiritual benefits offered by these ecosystems. The communities living in these ecosystems depend upon the services and output of these ecosystems which directly affects their livelihood and quality of life, therefore, degradation of these ecosystems directly affects a large population by depriving them of their livelihood options. A majority of marine and coastal habitats have been degraded or transformed mainly through anthropogenic impacts. The health of the ecosystem and well-being of the population dependent upon them is regulated by the way people use, abuse or care for the ecosystem.

Habitat and Biodiversity Loss in coastal and marine ecosystems

A brief account of the status of habitats has been summarized in tabular form as hereunder (UNEP, 2006):

Summary of Status by habitat types

HABITAT TYPE	STATUS	COMMENTS
Estuaries	Substantial loss	e.g., < 10% natural coastal wetlands remain in California, with over half of U.S. coastal wetlands substantially altered
Mangroves	35% loss in last two decades for countries with data	>80% loss in some countries
Coral reefs	20% severely damaged and unlikely to recover (2004 estimate); 70% are destroyed, critical, or threatened (2004 estimate)	Caribbean and Southeast Asia most degraded
Intertidal habitats and deltas	Substantial degradation	37% loss on Yellow Sea coast of China since 1950; 43% loss in South Korea since 1918
Beaches and dunes	Complete loss or degradation in many places	
Seagrass beds	Major losses in Mediterranean, Florida, and Australia	Degradation expected to accelerate, especially in Southeast Asia and the Caribbean
Kelp forests	Probably none exists in a natural condition	
Saltmarshes or ponds	Massive alteration and loss	
Semi-enclosed seas	Becoming highly degraded	
Other bottom communities	Severely impacted by effects of fishing	Strong evidence for impacts on ecosystem function and resilience

Stakeholder Participation in Decision-making

Stakeholders include government, local institutions, local communities, nongovernmental organizations as well as the private sector especially in case of industrial fisheries. Stakeholders' participation in the management of coastal resources and their involvement in policy development, planning and decision making has proven to improve the recovery of coastal ecosystems. Key steps to improve participatory processes are to increase the transparency of information, improve the understanding of the issues, improve the representation of marginalized stakeholders, engage them in the establishment of policy objectives and priorities for the allocation of services, and create space for deliberation and learning accommodating multiple perspectives.

Awareness, capacity building and empowerment of coastal communities

Communication, education, and public awareness are important components of successful ecosystem management. This is to ensure that all entities of the management system are fully aware and have realization of the implications of the decision and action taken by them. Empowered communities are more effective partners in the management of resources for its sustainability. Providing the human and financial resources to undertake effective work in this area is a continuing barrier.

Monitoring

Monitoring is an important component of any management strategy. It is best used by applying indicators and conducted following a participatory approach. Given the substantial deficiencies in understanding marine and coastal ecosystems, the development of indicators for biophysical and socioeconomic responses to management measures is currently limited. The involvement of the community in the monitoring of ecosystems is key to the success.

Trade-off Analysis

Trade-offs between ecosystem services will be essential in the future to make equitable and sustainable use of the world's resources. Policy decisions will need to address trade-offs between activities that impact coastal and marine well-being and land / water uses such as fisheries, agricultural production, water quality, and upstream barriers to water flow to coastal zones. The lack of understanding of ecosystem services, including their economic values, contributes to difficulties in finding the right balance. Tools for addressing trade-offs include, environmental impact assessment and the zoning of areas, which has been applied in many terrestrial areas, but less so in marine and coastal systems.

Ecosystem approach

- Linking the Integrated Management and Planning of River Catchments and Coastal Areas (integrated coastal management and planning)
- Marine Protected Areas
- Protection of coastal areas
- Management of Nutrient Pollution: Runoff and Fossil Fuel Combustion
- Waste Management: Household and Industrial Sewage
- Fisheries Management
- Aquaculture Management
- Applying International/Regional Mechanisms

CONCLUSIONS

Aquatic ecosystems are amongst the most productive ecosystems in the world and provide many services including livelihood to a big population. However, these ecosystems are also considered to be one of the most threatened and fragile system. In present context, many of these ecosystems are degraded to varied extent and used unsustainably. The major drivers of change, degradation, or loss of biodiversity and services are mainly anthropogenic. Some other factors are: population growth, land use change and habitat loss, overfishing and destructive fishing methods, illegal fishing, invasive species, climate change, subsidies, eutrophication, pollution, technology change, globalization, increased demand for food, and a shift in food preferences. Our future thrust are to ensure sustainable use of resources would be to test and develop ecosystem specific institutional and technical options for the management of aquatic ecosystems that serve three essential, complementary and mutually reinforcing requirements of sustainable development, namely: the generation of

economic benefits, especially for the poor; the strengthening of the participatory institutions; and the maintenance of ecosystem integrity. Among the response options, ecosystem based approach for conservation coupled with empowerment and capacity building of the people living in coastal and inland areas is the best solution to reverse the deterioration in the coastal and marine ecosystems.

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