

Impacts to the Coastal Zone

Marine protected areas (MPAs) are increasingly recognized as a key component of coastal and marine biodiversity conservation and protection, fisheries management, and a means of insuring the sustainable development of the marine environment. The need to integrate and protect terrestrial, marine and atmospheric systems imposes an urgent need for the establishment of comprehensive, protected area management within broader coastal zone conservation strategies. The principles of sustainable development and recent international legal developments provide a supporting framework for national governments to introduce ICZM programs to protect and sustain coastal resources. This global agenda will facilitate the adoption of ICZM and will strengthen existing national programs. Some of the most significant international agreements are:

- The 1982 Convention on the Law of the Sea (CLOS) (United Nations, 1982);
- The Convention on Biological Diversity (CBD) (United Nations, 1992);
- In response to CLOS and Agenda 21 (UNCED, 1992), 110 nations signed a non-legally binding agreement, the Global Program of Action for the Protection of the Marine Environment from Land-Based Activities in November 1995 (GPA) (UNEP, 1995);
- The UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks (the Straddling Stocks Agreement) (United Nations, 1995);
- The FAO Code of Conduct for Responsible Fishing (FAO, 1995).

This section provides a generic review of human activities and the threats to the coastal zone that are they create. Despite the fact that humans in the coastal zone are often dependent on resources from the sea, their activities are increasingly directly threatening their sustainable exploitation and indirectly threatening the ability of the coastal zone to provide protection from storms, natural disasters and climate change by altering the functionality of the coastal system. Human activities can impact the coastal zone by:

- Over exploiting resources that threaten the opportunity for current and future generations to use coastal and marine resources.
- Over exploiting resources such that ecosystems are altered and coastal systems are unable to maintain their functionality, such as providing natural sea defences.
- Altering the physical characteristics of the coast such that functionality of coastal structures alters or disappears.
- Altering inputs into coastal and marine waters (river flows, industrial and domestic discharges) that impact coastal ecosystems (chemical, nutrient and/or sediments) or coastal geomorphology (sediments) such that resources and/or functionality are changed or lost.

There are a number of underlying factors resulting in overexploitation within the coastal zone. They can be broadly classified as being results of:

- high rates of population growth;
- poverty exacerbated by dwindling resources from unsustainable exploitation of fisheries, agricultural land and forests, often as a result of the common property, open access nature of the resource;
- poverty exacerbated as a result of resource degradation from unsustainable development and pollution;
- lack of employment opportunities and/or socio-economic opportunities to avoid resource overexploitation;
- lack of awareness about sustainable resource management amongst stakeholders and policy-makers;
- lack of a cohesive, inter-departmental government approach to management and development of resources within the coastal zone.

The following main uses for the coastal zone, which point to the need for an integrated management framework, can be identified:

- urban settlement;
- industrial development (requires access to marine transport; uses sea water, is shipping-related, uses sea as raw material);
- waste disposal (sewage, industrial, pesticides, fertilizers, land-based sources of marine pollution = 75% of total);
- shore protection works (inappropriately constructed);
- ports and marine transportation (oil and gas, shipping, fisheries, military);
- land transportation infrastructure (roads, bridges and causeways often threaten intertidal habitats, but are corridors for future development);

- water supply projects (fisheries and mangroves affected);
- sea fisheries (importance often underestimated, production is more than world beef and sheep combined);
- aquaculture (shrimp etc. need clean water, free of pollution);
- coastal mangrove industries (limited);
- coastal agriculture (land conversion, pesticides and fertilizer runoff);
- coastal forestry (deforestation);
- tourism development (requires good resources, no physical or social disturbances);
- sand and coral mining (limited possibilities without threatening the resource and coastal habitats); and
- national security (customs, naval, coastal airfields).

The following sub-sections provide a general review of some of the most pertinent issues faced by the coastal zone of India.