

Coastal Zone Management in India

An underwater photograph of a vibrant coral reef. The scene is dominated by large, rounded, greenish-brown coral structures. In the center, there is a tall, branching, light-colored coral. The water is clear and blue, with several small, colorful fish swimming around the reef. The overall atmosphere is bright and healthy.

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PREAMBLE

- **India is one of the 12 mega-biodiversity centres in the world.**
- **India – 4th largest producer of farmed shrimp in the eastern hemisphere.**
- **Fishes: About 12% of all the world's fishes are in India, or about 2200 species.**
- **Wetlands: About 4 million ha (2.6 million are man-made).**
- **Significant erosion of India's biodiversity at the ecosystem, species and genetic level has already taken place.**

Root causes of loss of biodiversity

Qualitative in nature.

Major causes of loss of biodiversity include:

- ❖ habitat destruction and degradation,
- ❖ over-exploitation of living resources,
- ❖ introduction of exotics,
- ❖ human induced changes, and
- ❖ climate change
- ❖ increasing social, political and economic inequities;
- ❖ inappropriate and unclear tenurial arrangements and inter-departmental conflicts;
- ❖ changes in cultural, ethical and moral values;
- ❖ lack of recognition of the full values of biodiversity;
- ❖ inappropriate, inflexible, weak and contradictory laws and policies, demographic changes, etc.

Oceans

- Covers 71% of the globe.
- Support a wide spectrum of living and non-living resources.
- Provides over 1/5th of the food and oxygen used by the mankind.
- Source of food, energy, metals and minerals, oil and gas and a means of trade, transport and recreation.
- Out of an estimated 30 million species of flora and fauna on the planet earth, the catalogued list is only 1.4 million species with nearly 20% from oceans.
- Over 60% of the global population living along coastline.
- Human intervention become quite pronounced in case of living resources due to growing demand for marine products in both domestic and export markets.

What is coastal zone?

Coastal zones are defined by the extent of territorial waters up to the high water mark.

Generally the world's coastal zones are long narrow features of mainland, islands and seas, generally forming the outer boundary of the coastal domain (from 200m above sea level to 200 m below sea level).

Coastal zones include the entire continental shelf and occupy about 18% of the surface of the globe, supplying about 90% of global fish catch and accounts for some 25% of global primary productivity while at the same time being some of the most endangered regions on the planet.

Uniqueness of the coast

- **Protection from storms and hurricanes.**
- **Climate stabilization**
- **Treasures unique ecosystems**
- **Harbors rich diversity**
- **Provides varied resources**

Coastal Zone

- **India's coastline of over 8100 km.**
- **Supports a wide variety of coastal activities.**
- **Comprise various types of coastal habitats.**
- **Plays a major role in terms of economy and ecology.**
- **Natural processes and human interventions cause changes in status of coastal zone resulting in degradation/loss of amenities and habitats.**
- **An interface between land and sea with integrated complex of marine, coastal land sub-systems and shoreline environments.**
- **Includes beaches, sand dunes, coastal plains, inter-tidal mudflats, mangrove forests, sea grass, coral reefs and lagoons.**
- **Is dynamic with frequent changes in biological, chemical and geological parameters.**

Issues & problems

NATURAL

Sea Level Rise
Sedimentation
Disasters
Tsunamis
Earthquakes
Flooding
Cyclones

MAN MADE

Pollution
Biodiversity Threats
Urbanization
Soil Erosion
Salinity Ingress
Population Stress
Sewage Disposal
Resource Exploitation
Over Urbanization

Resources of Coastal Zone

- **Natural renewable and non-renewable, cultural, historical and archaeological.**
- **Fishing of near-shore waters and farming of coastal lowlands are the major economic activities.**
- **Provides for marine transportation, recreation, tourism and salt production.**
- **Highly productive with high biological diversity.**
- **Nursery habitats for many species.**
- **Coastal features form natural defence against storms, floods and erosion.**
- **Common and rich nature of resources, with open access, attract human settlements along coastline.**
- **20 % of the Indian population lives in the coastal areas.**
- **Increasing urbanisation and human settlements lead to over-exploitation of coastal resources resulting in resource depletion and user conflicts.**

Resources of Coastal Zone

- ❑ 12% of the world fish genetic resources found in Indian waters.
- ❑ Out of 20 000 documented fish species worldwide, 2546 finfish species recorded in India.
- ❑ Twenty-seven species are considered rare/ endangered/ vulnerable.
- ❑ Island ecosystems in India - two broad types: coralline, as that of Lakshadweep, and submerged mountain tops harbouring tropical rainforests, as in A & N Islands.

Threats to Coastal Zone and Related Ecosystems

- ⇒ **Rapidly increasing populations and associated urbanization,**
- ⇒ **Commercialization and monetization,**
- ⇒ **Technological improvement,**
- ⇒ **Detrimental fishing methods,**
- ⇒ **Logging of forests and mangroves,**
- ⇒ **Pollution,**
- ⇒ **Changing agricultural practices and coastal developments or conversions**

Threats to Coastal Zone and Related Ecosystems

- Discharge of huge quantities of untreated sewage into sea leads to eutrophication, resulting in toxic algal blooms or “red-tides”.
- Expansion of urban settlements, exploitation for fuel, agricultural development and construction of fish and shrimp ponds put pressure on mangroves and coastal wetlands.
- Almost 60% of world’s reefs threatened by human activities.
- Coral reefs prone to severe damage from natural disturbances - cyclones and temperature extremes.
- Climate change and storms lead to bleaching events.

Legislation for Aquatic Biodiversity

Important Acts Relevant to Biodiversity

- **Indian Forest Act 1927** enables States to acquire ownership over forests and their produce.
- **Wildlife (Protection) Act, 1972** (amended further) provides for protection of wild plants and animals and regulates hunting, trade and collection of specific forest products.
- **National Wildlife Action Plan, 1973** identifies broad goals of establishing a network of representative protected areas and developing appropriate management systems .
- **Forest (Conservation) Act, 1980**, deals primarily with using forest lands for non-forestry purposes, mainly industry and mining.
- **Environment (Protection) Act, 1986** empowers central government to take appropriate measures for protecting and improving the environment .
- **Foreign Trade (Development and Regulation) Act, 1992** to stimulate sustained economic growth and enhance technological strength and efficiency of Indian agriculture, industry and services .

Other Conventions and International Agreements on Biodiversity

- **Acceded to Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 1976.**
- **India became a party to Ramsar Convention in October 1981 and designated Chilka Lake as a Ramsar Site, but recently removed from the list.**
- **Under U. N. World Heritage Convention, India declared Sundarbans National Park as a World Heritage Site.**
- **India is a signatory to:**
 - ❖ **Convention on Biodiversity,**
 - ❖ **Convention on Migratory Species,**
 - ❖ **Framework Convention on Climate Change,**
 - ❖ **U. N. Convention on the Law of the Sea, etc.**

Legal Framework on Fisheries

- **Territorial Sea, Continental Shelf, EEZ and other Maritime Zones of India Act 1976.**
- **Marine Fishing Regulation Act (MFRA)**
- **Coast Guard Act 1978**
- **Maritime Zones of India Act 1981**
- **Environmental Protection Act, 1986**
- **Coastal Regulation Zone (CRZ) 1991**
- **UN Convention on the Law of the Sea (UNCLOS)**
- **Maritime boundary agreements with Sri Lanka, Maldives, Indonesia, Thailand and Myanmar**
- **UN Convention on Straddling and Highly Migratory Fish Stocks**
- **Agreement to promote compliance with International Conservation and Management measures by Fishing Vessels on the High Seas, Code of Conduct for Responsible Fisheries, FAO International Agreement on Fishing Capacity, etc.**



Integrated Management Concept

- Involves comprehensive planning and managing of human activities to minimize conflict among users;
- A collaborative approach that cannot be forced on anyone;
- A flexible and transparent planning process that respects existing divisions of constitutional and departmental authority,
- Does not abrogate or derogate from any existing Aboriginal or treaty rights.

Planning: involves six interrelated stages:

- defining and assessing a management area;
engaging affected interests;
- developing an Integrated Management plan;
- receiving endorsement of the plan;
- implementing the plan; and
- monitoring and evaluating outcomes.

Integrated Management Principles

Integrated Management Principles

- ❖ ecosystem-based management,
 - ❖ sustainable development,
 - ❖ precautionary approach,
 - ❖ conservation;
 - ❖ shared responsibility,
 - ❖ flexibility and inclusiveness
- A simple and common sense approach, a modern and qualitatively different way to use, protect and conserve oceans and coastal waters

Research efforts to protect and conserve biodiversity

Ecosystem Surveys under the programmes for inventorying and monitoring India's biodiversity include Marine, Islands, Mangroves, Wetlands and Coastal areas.

NIO, CMFRI, ZSI, BSI, Universities and academic institutions provide institutional support in identifying, creating databases and monitoring coastal and marine biodiversity .

National Remote Sensing Agency (NRSA), universities and other institutions have launched a number of programmes to monitor India's coasts with the aid of satellites.

Marine Products Export Development Authority (MPEDA) has begun a document on cultivable marine species.

National Bureau of Fish Genetic Resources (NBFGR) is devoted to conservation and sustainable use of fish diversity in India.

MoEF conducted a survey and published the first wetland directory.

Under the Ganga Action Plan, improving sewage-treatment technologies has been emphasized.

Purpose of coastal zone management

- Maximize the benefits provided by the coastal zone
- Minimize conflicts and harmful effects of activities upon each other, resources and the environment
- To dissipate tidal and wave energy & reduce risk from disasters
- To stabilise the adjoining land.
- Promote linkages between sectoral activities
- Guide coastal area development in an ecologically sustainable fashion

Coastal Regulation Zone Notification

Aim

To preserve and protect coastal zone from activities that may cause degradation of quality or loss of coastal land

Principles

The CRZ Notification was introduced with three main principles:

- It is necessary to arrive at a balance between development needs and protection of natural resources.**
- Certain activities are harmful for both coastal communities and their environment, and these should be prohibited or regulated.**
- If coastal ecosystems are sustainably managed, then the livelihoods of millions will be protected and their survival guaranteed.**

Genesis

- 1981 –Prime Minister Indira Gandhi’s letter: Keep 500 m from the HTL free from development activities**
- 1982-Working Group on beach development guidelines**
- 1983-Guidelines for the development of beaches (Tourism, Industrial development, Urban and rural development Special areas –mangroves, scenic areas, corals, oceanic islands)**
- 1986 –Environmental Protection Act**
- 1989 –Draft CRZ Notification**
- 1991 –CRZ Notification**
- 1994 –Supreme Court direction asking for strict implementation of CRZ**
- 1996 –Approval to State CZMPs**
- 1997 –Constitution of Aquaculture Authority**
- 1998 –National and State Coastal Zone Management Authorities**
- 2001, 2005, 2007 & 2011 – Further amendments in CRZ/ CMZ**

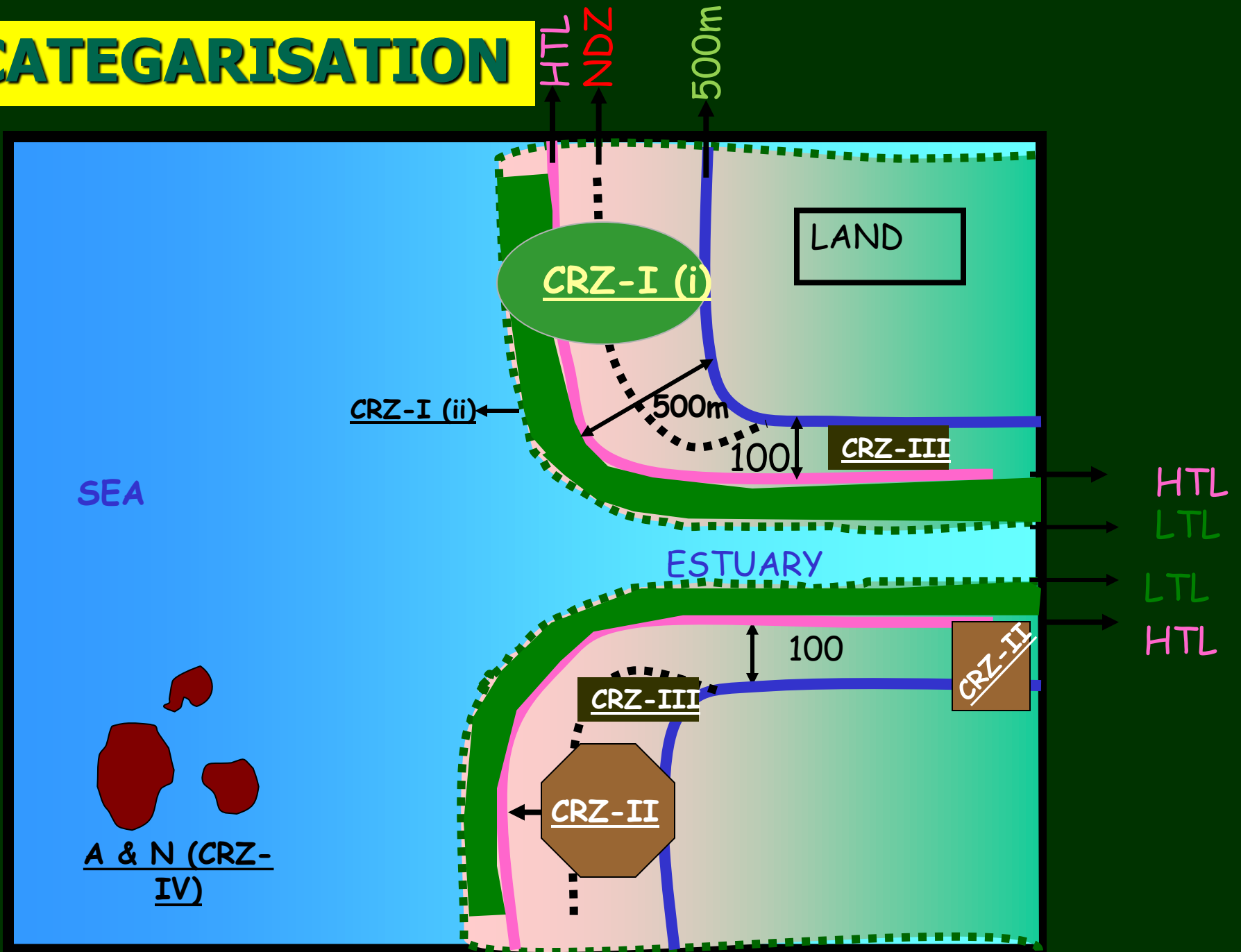
How it progressed.....

- Vohra Committee
- Saldhana Committee
- Balakrishnan Nair Committee
- Saldhana Committee
- Babu Paul Committee
- Swaminathan Committee

COASTAL REGULATION ZONE

- & Notification issued in 1991 (Latest amendment 2011)
- & Coastal stretches of seas bays, estuaries, creeks, rivers and backwaters influenced by tidal action up to 500 m from High Tide Line (HTL) and the area between HTL and low tide line (LTL) is classified as CRZ
- & Distance from HTL applied to both sides in rivers, creeks, backwaters and distance shall not be less than 100 m or width of water bodies whichever is less
- & Extent of tidal action defined as up to 5 ppt salinity

CATEGARISATION



PROHIBITED ACTIVITIES

- & Setting up of new or expansion of existing industries except those requiring water fronts, projects of Atomic Energy, Non-polluting industries of IT, SEZ; Desalination plants, Non-conventional energy plants, Air strips in A & N except in CRZ I**
- & Manufacture or handling of hazardous substances except their transfer from ships to facilities with adoption of safety regulations**
- & No fish processing industry including warehousing but excluding hatcheries & natural fish drying - exceptions for modernisation with NOC from PCBS**
- & Setting up and expansion of units for disposal of wastes, effluents except facilities required for discharge of treated effluents, storm water drains, treatment of wastes from beach resorts, domestic wastes in islands**

PROHIBITED ACTIVITIES (CONT.....)

- & Discharge of untreated wastes and effluents from industries and municipalities etc. - phasing out within 3 years - land filling - fly ash or other waste dumping by power plants**
- & No land reclamation, bunding except structures for coastal erosion, storm water drains, jetties, structures for prevention of salinity ingress and formation of sand bars**
- & Mining of sand & rock banned except for rare minerals not available outside 500 mt. zone except for sand mining in A& N islands upto March 2004 with restrictions**

PROHIBITED ACTIVITIES (CONT.....)

- & Harvesting or drawl of ground water within 200 m of HTL: 200 - 500 mt drawl permitted through wells manually - exceptions in areas of water scarcity**
- & Construction in CRZ 1 areas except those permitted**
- & No alteration of hills, sand dunes for beautification, etc.**
- & any construction activity except for carrying waste water, operational discharges through pipelines**

REGULATION OF PERMISSIBLE ACTIVITIES

Following activities need clearance from MOEF

- Construction activities of Atomic energy & Defense projects- clearance valid for 5 years**
- Clearance for projects needing water front**
- Operational constructions of Ports, harbors and light houses, jetties – based on scientific study**
- Exploration and extraction of oil and natural gas and associated facilities**

REGULATION OF PERMISSIBLE ACTIVITIES

- **Intake and discharge of cooling water for power plants**
- **Mining of rare minerals**
- **Specified activities of SEZ**
- **Facilities for power generation by non-conventional energy sources, desalination plants and weather radars**
- **Air strips and associated facilities in A,N & Lakshadweep islands**
- **Demolition or reconstruction of buildings of heritage importance and public use**
- **All other activities with investment of Rs.5 cr or more**

CRZ I

- & **ECOLOGICALLY SENSITIVE AREAS**
- & **AREAS CLOSE TO BREEDING & SPAWNING GROUNDS OF FISH ETC**
- & **AREAS OF HISTORICAL IMPORTANCE**
- & **AREAS LIKELY TO BE INUNDATED DUE TO SEA LEVEL RISE UPON GLOBAL WARMING, EROSION PRONE AREAS**
- & **AREAS OF RESERVE FOREST, OUTSTANDING NATURAL BEAUTY**
- & **MARINE PARKS**
- & **INTER-TIDAL AREAS**

CRZ II

- & AREAS ALREADY DEVELOPED CLOSE TO SHORE FOR Eg., URBAN AREAS**

CRZ III

- & RELATIVELY UNDISTURBED AREAS AND THOSE DO NOT BELONG TO CATEGORY I & II
i.e. Coastal rural areas and substantially not built-up areas within municipal limits**

CRZ IV

- & SPECIAL PROVISIONS FOR ANDAMAN & NICOBAR AND LAKSHADWEEP ISLANDS**

IMPLEMENTATION

- & Steps to prepare Coastal Zone Management Plans identifying and classifying CRZ areas and all activities related as per the provisions of notification**
- & All States have prepared Plans but in the process of refining CRZ boundaries**
- & CZMP need approval of MoEF including their future commitments**

COASTAL ZONE MANAGEMENT AUTHORITY (CZMA)

- & State and National authorities constituted in January 2002**
- & State Authorities have power to take measures for protecting and improving quality of Coastal Environment and controlling pollution**
- & Other functions are:**
 - Examination of proposals seeking changes in CRZ classification and in CZMP**
 - Violation of provision of CRZ and to take appropriate actions**

THANKS