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INTINTEGRATED MANAGEMENT OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION ALONG THE INDIAN COASTS

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Prologue:

Agenda 21, a document produced at the Earth Summit in 1991, devoted the chapter 17 fully for considerations of the health of the marine environment. In the context of this paper it is relevant to repeat some of its proposed programmes here and to note they are ‘integrated in content and precautionary and anticipatory in ambit’: 

1. Integrated management and sustainable development of coastal areas, including Exclusive Economic Zones; 
2. Marine environmental protection; 
3. Sustainable use and conservation of marine living resources of the high seas; 
4. Sustainable use and conservation of marine living resources under national jurisdiction; 
5. Addressing critical uncertainties for the management of the marine environment and climate change; 
6. Strengthening international, including regional cooperation and coordination; 
7. Sustainable development of small islands.

The process of initiation and implementation of Integrated Coastal Zone Management (ICZM) which began in India through Coastal Regulation Zone in February 1991 (CRZ Notification) has been embroiled in the above seven programmes. Reasons for the complexity of the response from the Indian coastal stakeholders including the environmental groups lie in the geomorphologic heterogeneity of the Indian coasts along with its extensive length (7500 KM), incomparable environment, ecology and resources, and its diverse socioeconomic fabric. Globalization having strong stakes in the coastal development only provided further impetus to the intensity of the situation. Quality of responses themselves ranged from sometimes being practical or irrational, to being driven by lobbies having shares in the developmental activities.

The ICZM Implementation in India:

International Geosphere-Biosphere Programme (IGBP) in its implementation plan for Land Ocean Interaction in Coastal Zone (LOICZ), one of its Core project, to achieve certain of its goals, suggests coastal zones to be discriminated into classes of high similarity in order to serve as modules for a future Earth system model. The same method of discrimination could be a practical approach to be tried for effective implementation of the Integrated Coastal Zone Management plans in India.

Interestingly, the Ministry of Environment & Forests of the Government of India (M/o EF), in one of its background material intended for a meeting on ICZM divided
the Indian coasts into 4 major types based primarily on geomorphology and geographic continuity. They are 1. The East Coast, 2. The west coast south of Gujarat, 3. The Gujarat coast, and 4. The coasts of the Andaman & Nicobar and the Lakshadweep group of islands.

But, the coastal stretches of India do exhibit variations in important environmental and ecological niches and resources abundance than simply presence or absence of mud flats and small diameters of its islands. Some of those are:

1. Estuaries, creeks and backwaters forming a dense network of the saline tidal water bodies
2. Cliffs and promontories jutting out into the sea.
3. Sandy beaches of varying lengths but except in a few places like the marina beach in near Chennai in Tamil Nadu, most have very short shore width (often <300m) between settlement areas and the sea. This feature assumes a very important role in ICZM plans and the setbacks suggested in the CRZ notification.
4. Mangrove forests ranging from fringing swamps to rich ecosystems.
5. Low lying areas inundated with saline water and used for traditional pisciculture or agriculture.
6. Storm surges at certain places.
7. Nesting sites for exotic species such as horse shoe crabs and Olive Riddley turtles
8. Highly fertile fisheries zones providing an economic source of protein to low income coastal community and valuable foreign exchange to the nation.

Besides the above environmental and ecological niches, the Indian coasts have developed in a manner unlike to that of western countries. Up till late 80s and early 90s, its coasts had a couple of mega cities such as Mumbai, Vizag and Chennai and widely interspersed smaller ones such as Mangalore, Kandla, Mormugao, Kochi, Paradip and Pondicherry. Most of the rest of the coast was rural in character and generally inhabited by the weaker sections of the society. Especially on the West Coast of India, the major trend was demographic migration from coastal strips to Mumbai or Kochi for career development or decent employment.

While introducing the concept of ICZM on such a platform, the policy planners laid major stress on the prohibitive and restrictive activities in the coastal regulation zones without educating the stakeholders about its positive and cross sectoral approach. Even before the 1991 statute, in early eighties, a cross-country debate was started about banning any activity within the 500 meters area along the entire coastline of India. This simple anticipation pressed the panic button in the psyche of stakeholders and investors, and started a mad rush for coastal infringements. The situation worsened in early nineties with the opening of Indian economy to the world market forces. Industries with multinational collaboration in fields such as power generation, chemicals and pharmaceuticals, ports and harbours and aquaculture were set up in the regions of heterogeneous geomorphology and socio-cultural features. Consequently, the coasts were depleted of rich terrestrial and marine eco-sensitive areas, fragile shorelines prone to erosion/accrretion and large sand dune belts. Land reclamation, structures constructed in the inter-tidal zones without carrying proper scientific EIAs and inertia in implementation of environmental laws have become routine phenomena. Possible consequences of these anthropogenic activities and
practices on Indian coasts make the LOICZ goals very interesting to achieve. Some of these are:

1. To determine the fluxes of material between land, sea and atmosphere through coastal zone,
2. The effect of changes in external forcing conditions on the structure and functioning of coastal ecosystems,
3. To determine how changes in land use, climate, sea level and human activities alter the fluxes and affect the coastal morphodynamics,
4. How changes in coastal systems will affect the global carbon cycle and the trace gas composition of the atmosphere.
5. To develop further scientific and socioeconomic bases for the integrated management of the coastal environment'.

The guidelines of Agenda 21 do not exclude development of the coasts but requires it to be sustainable and conserve the ecosystems and resources. 'Precautionary and anticipatory approach' in the decision making process and capacity building during implementation stage, are also vitally important specially when the consequences of the developmental activities are debatable. This needs a holistic approach and premeditated and futuristic planning and implementation, activities in which all sections of the society should participate. But the rapid pace of the commercial and business ventures, given momentum in many cases by the technological advances, do not look at the long term benefits of sustained development.

The ICZM and Coastal Developmental activities:

A couple of examples of the above could be elaborated, where 1. A port has to be constructed and 2. Beach resorts are to be developed.

1. Port & harbour development:

Ports to be economically beneficial should generate infrastructure and a complete support system of import-export units along with industrial belts, housing for the employees and other supporting societal units. It also needs an elaborate rail and road network connecting it to hinterlands and other far-off areas with potential to feed its export potential and consume the imports. In case of a port with few tens of berths and kilometers long quay lines, the environmental setups, both physical and socio-economic, of the entire area coping up with above developmental activities undergo drastic changes akin to major upheavals. The West Coast of India has close network of estuarine ecosystems and promontories, whereas the East Coast has large deltaic regions and coastal stretches susceptible to storms. Construction of a port under these circumstances is a subject of serious studies, to be completed before either the development is lagged behind or the ecology is permanently lost.

It is reported that on an average the 12 major Indian ports are working at 113% of their capacity utilization. (Based on data from “Center for Monitoring Indian Economy”. The question to moot is how to manage India’s growing international trade and this query would continue to gain more and more credence as effects of the
globalization are felt to its full potential. It would also achieve complexity as the coastal environmental situation turns grim.

Integrated Coastal Zone Management is an ideal modus operandi to be employed in the situation. But in India, various aspects of the center-state relationships are still under study for all its constitutional implications. Presently, plans for the construction of ports are conceived and initiated by the state governments even if they have to obtain an environmental clearance from central ministry at which stage they have no role to suggest another state as a better place to set up the project. If ICZM ideas are to be employed in this situation, then Central Government should play a major role in activities such as port construction and development due to its far reaching impacts. A state government is always under pressure to increase its own revenue but a federal government could look at the problem in a holistic way and offer a solution.

2. Hotels and beach resorts:

In 1980s, the regional development plan of Goa, while outlining its policy of tourism development, recommended these activities in select beachhead areas and not along its entire shore lengths. But in spite of its splendid plans, hotels and beach resorts are being permitted all along the coastline, sometimes straight on the high tide lines thus reducing the beach area, although the CRZ Notification prohibits it.

The coastline of Goa offers certain coastal stretches (Salcete in central Goa and Calangut-Candolim belt in Northern Goa) which have no sensitive ecosystem except for the sand dune belts. The ideal solution would have been to keep setback as suggested in the CRZ notification and construct hotels beyond the coconut groves or orchards as is done in Seychelles. This way the ambient environment is preserved and business continues in a sustainable fashion without crossing the carrying capacity of the beach for such activities.

3. The place for databases in Indian ICZM:

Above two examples also highlight the need for useful and scientific data bases to help arrive at the decision making process. Unfortunately the reforms in the database structure have not kept pace with advances made in sciences and technologies. If satellite imageries are being employed to arrive at the extent of forest cover and other items in the country, the scales cause problems due to non-availability of funds for using scales such as 1:12500. GIS applications and use of Global Positioning System are still rarely used in private and government agencies.

Sometimes, the methodologies adopted and procedures employed during EIA lack the spirit in which they are to be carried. As an example, the EIA formats do not require concentrations of petroleum hydrocarbon in water, but the parameter is captioned as presence of oil and grease. Pollutionwise, presence of >100 micro gram per liter of petroleum hydrocarbons is considered as toxic, but under existing formats, the EIA would mention oil and grease as ‘not present’ in the water body. Another example concerns with forestry. Generally, EIAs mention forest cover without giving the density of the forest. The economic value is purely commercial, in terms of wood
and fruit. The environmental economics is still unheard of even in Indian Universities. While deliberating upon the environmental feasibility of a mega port, it is essential to calculate the cost of oxygen that would have been produced, carbon dioxide/sulfur dioxide absorbed, the decrease in fluxes of carbon and nitrogen to the coastal seas and habitats of flora and fauna lost. Socio economic data besides giving census figures, should consider the number of people who have to change their trade or career when a developmental project is planned and amount of demographic migration expected over 25 years. All these databases need expert computation. The need for capacity building is evident, but political will is essential too.

Epilogue:

During most debatable issues concerning coastal developments, the decision-making bodies tend to overlook directive principle of Agenda 21, that coastal management is 'integrated in content and precautionary and anticipatory in ambit'. The lobby pressures are heavy and tend to make short term gains appreciable. Because the environmental heritage is being lost irretrievably, the ultimate sufferers are children of today and generations of tomorrow.

One positive counter would be mass education programme on environmental awareness. It is difficult to change thought processes and actions of a grown up adult with vested interests. But children would tell a different story. The best bet in environmental education is to start environmental education right from kindergarten levels. This is also practical because these are the people who would have to live in the major part of the next century. They also happen to be our own children and grandchildren. This realization should make sense to us while taking decisions.

(Note: This paper is based on discussions and other empirical observations made during meetings and report preparations while representing National Institute of Oceanography at various environmental impact assessment and Integrated Coastal Zone Management committees at the state and national levels, in India.)

Resource material: