



Changes in erosional and depositional processes with time and management of Goa Coast, central west coast of India

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Abstract:

Coastal and estuarine environments, world over are facing immense impact due to both natural and anthropogenic processes. The natural processes include climatic changes, rise in sea level, cyclone, flood, tsunamis, coastal erosion, salinity ingress and siltation. Likewise, anthropogenic pressures include population expansion, ocean traffic, dredging, resource exploitation, pollution, unplanned urbanization and intensive industrialization. Due to these impacts the fragile coastal ecosystem and its entities, like sub ecosystems, resources, morphological units are undergoing unprecedented degradation, rendering these coastal regions vulnerable, impinging risk to human population, livestock, properties, as also, devastation of resourceful lands. This accelerates economic fatalities and irreversible obliteration to the ecosystems.

Evidences on the global concern towards this issue have been well established. The countries world over, including India, pledged consensus towards the protection of the fragile coastal ecosystems through UNCED, Agenda-21. India, on 19th February 1991, has designated specified corridors along the landward side of the coastline as “Coastal Regulatory Zones” (CRZ), through appropriate policy and law. In context with the CRZ notification, scientific database at local and site-specific areas, developed. Synergy of ecosystems, landscape and resources with demographic, tourism data, vis-à-vis, economic corridors/sectors aided the paradigms and criterion for local and site specific prescriptions for Goa Coast.

The Goa coast is a part of central west coast of India and is characterized by pocket beaches flanked by rocky cliffs, estuaries, bays, and at some places mangroves. Beaches in southern Goa are long and linear in nature with sand dunes. The Mandovi and Zuari estuarine system in Goa is the largest in this part of the coast. Mud flats, swampy marshes and wetlands are found mainly along estuaries and creeks. The beaches of Goa are stable beaches with seasonal morphological changes and annual cyclicity. The coastal zone in Goa is exposed to environmental and anthropogenic pressures. Some of the factors attributing to these pressures can be due to demographic settings and population growth, rapid urbanization, migration, recreation and tourism activities, fishery activities, transportation problems, socio-economic shift and transformation in occupation like, fishing, tourism, trade, salt industry; wetlands conversion, degradation of agriculture land and fallow lands. Shoreline changes observed overlapping the data after 32 years showed that all along the coast of Goa, from north to south, there is large variation in depositional and erosional processes. Deposition is specifically observed at Morjim, Baga, Campal, Miramar, Mabor and erosion is specifically observed at Kerim, Anjuna, Velsao. The present study reveals that all along the estuarine systems, there is net deposition. Further change detection study carried out overlapping the data after 38 years showed transformation of Khazan lands, conversion of marshy swampy and water logged areas, increase in Mangrove areas and decrease in salt pans.

The present paper has succeeded in delineating various coastal ecosystems, coastal land forms, their resource potentials and transformation, if any. The study has helped earmarking the coastal region into conservation, development and utilization areas.