

COASTAL REGULATION ZONE (CRZ) REVIEW COMMITTEE'S REPORT: AN APPRAISAL

Background

India's Coastal Regulation Zone (CRZ) Act was notified in 1991, just before the Rio de Janeiro conference of June 1991 where the 'importance of oceans and coasts in the global life support areas' was to be debated. One of the major regulations in the Act pertained to the banning of all kinds of 'artificial development' up to 500 m from the high tide mark, made applicable to all the diverse Indian coastal zones. There has been much debate on this aspect, more so after the devastating tsunami of 26 December, 2004. The Ministry of Environment & Forests, Govt of India that regulates the health of Indian coasts took years to appoint an expert committee to review and make recommendations with regard to the implementation of CRZ, 1991. Finally the Committee Report, chaired by the eminent agricultural scientist Dr. M.S. Swaminathan was brought out in Feb. 2005, which contains 6 chapters and 6 annexures.

The full text of the report is available on the web for the more interested reader (http://envfor.nic.in/mef/crz_report.pdf). This note attempts to critically examine this report from the geological perspective.

International Practices

Chapter 1 deals with Indian initiatives on coastal regulation and a narration of international practices. Description of the Indian coastline is quite elaborate. This is followed by a listing of Indian laws and regulations and the institutional structures, and various Committee Reports that suggested amendments to the 1991 Act. A narration on international best practices at the end of this chapter gives an impression that the committee has not thoroughly gone through the best practice regulations. For example the committee does not seem to have perused the US Congressional findings that clearly and sharply define the underlying factors behind reformulation of the Coastal Zone Management Act objectives in 1996. This gap in information has its manifestation while defining 'coastal zone' in chapter 4 (page 90) of the report, where administrative definition of the coastal zone is brought in, making the proposed Coastal Zone Management (CZM) in effect a bureaucratic practice/effort for the future also.

Coastal and Marine Resources

Chapter 2 is devoted to narration of coastal and marine resources. Whereas, living resources have been described

in certain detail, non-living resource description is handled in isolation with regard to CZM objectives. Subtitles such as 'areas of incomparable value', 'areas of scenic aesthetic value heritage and archaeological sites and areas of outstanding natural beauty' within non-living resources appear out of context. Under 'Coastal Geomorphic Systems', mudbanks, beaches, sand dunes, earth cliffs, rocky cliffs, rocky foreshores, sand bars, estuaries, lagoons, mudflats, deltaic areas, tidal inlets, barrier islands, lakes and islands are included, and described in isolation without indication of their organic link to the evolution of the coastal zone. Such fragmented approach is bound to result in inappropriate CZM plan formulations. Here the committee could have been benefitted from the US CZM approaches. Towards the end of the chapter, natural hazards are listed and coastal pollution mentioned.

Action Plan

Chapter 3 contains narration of revisit to CRZ notification 1991. Suggestions of the committee on Coastal Zone management (CZM) are contained in Chapter 4. Conclusion of the committee, recommending creation of structures for generating 'coordinated and cooperative action' among different Central and State Government agencies is dealt in chapter 5.

A national coastal zone management action plan with classification of the coastal zone into Coastal Zone Management – I, II, III and IV with regulatory measures constitutes chapter 6.

The report's weakness is more visible in the section dealing with 'scientific principles in coastal zone management' (page 25). A mere statement that 'conflicts in coastal management are primarily because coast requires space for functioning, whereas coastal space is required for various uses', is evasive of the complexities and essentialities of the issue. For example, amplification of the fact that coasts have a number of regulatory (in terms of global climate) and socio-economic functions, warranting their sustainable management is missing in the report. As a result, the management methodologies listed are lopsided. 'Vulnerability mapping' and 'setback zones' are brought in as management methodologies in implementing coastal zone management, without proper definition of the terms, and specificity of their application in the cited cases abroad (page 25, 26). A more elaborate description of global practices could have changed the entire approach with concurrent

elucidation for the committee itself, and better results for the Indian coasts

Natural Hazards

When one analyses vulnerability *per se* in terms of natural hazards, it means, "the measure of damage that a peril can cause to the built environment" In other words, drawing a vulnerability line/ zone as suggested in annexure I of the report is both subjective and speculative, at least in the event of earthquakes and tsunamis, wherein vulnerability would depend on a number of unknown parameters such as focal mechanism factors and rock characteristics in the event of an earthquake or tidal height and sea bottom configuration in the event of a tsunami Alternatively, subjective factors come to perform the basis of the so called "objective" zone demarcations If we compare CZM practices elsewhere, for example vulnerability mapping, it has been exclusively done for deriving vulnerability indices in the event of sea level rise, considering parameters such as geomorphology, coastal slope, rate of sea-level rise, past shoreline evolution etc It received a different handling, in the hands of the present Committee confusing with demarcation of setback lines (see for example annexure I) It may be noted that setback line means 'the boundary line beyond which the effect of natural hazards such as erosion, sea level rise etc will not be felt' Then this must be a dynamic feature as well Absence of such an approach has further resulted in the statement that "rain/ cyclone shelters" can be permitted on the seaward side of the vulnerability line" (Page 114), which indicates how confused is the committee in understanding vulnerability line Can huge human shelters be located within the vulnerability area? As such, the proposed vulnerability mapping is ill-advised, devoid of sound scientific methodology, and has presumably been imported from the findings of a preliminary study on National Assessment of Coastal Vulnerability to sea-level rise Preliminary results for the US Atlantic and Pacific Coasts (2000) by the US Geological Survey, meant for the Federal Government for future consideration It is perhaps pertinent to mention here that the Geological Survey of India, with proficiency in geomorphic mapping and state-wise presence has been totally omitted by the present Committee in scientific participation Survey of India's participation has also not been sought by the Committee in this massive endeavour This is beyond comprehension The more glaring irony lies in the fact that India's leading Oceanographic Institute did not have a proper representation

Coastal Zone Management

Claim in the report about the scientific approach as

different from the CRZ Act 1991 loses its steam, when CZM areas are proposed to be demarcated on administrative boundary basis, and where physical assets have been again invoked as restricting boundaries (page 133 & Annexure IV) Further, classification of CMZ III appears infertile, as it is no way different from CMZ-II, as far as risk factors are concerned Such cumbersome classification into CMZ I CMZ-II, and CMZ III is a prelude to reinforcing regulatory scheme that has been followed all these years This apprehension is strengthened by the statement that 'since the variations in terrain, topography, climate and economic geography are so widespread along our long coastlines, these institutions (that are to be set up) should undertake specific micro surveys to enable the listing of coastal assets in great detail Until the micro-surveys are completed, we should adhere to the current rules of notification 1991", leaving little hope for scientific management of Indian coasts in the near future free from licence-raj

The report does not mention the role of land inputs in the coastal changes It may be noted that riverine inputs such as sediments and water help regulating the erosion/accretion regime and pollutants result in coastal resource degradation As such, two principles of CZM i.e. land inputs and pollution from interior lands have found omission in the report Mention may be made that Integrated Coastal Zone Management schemes world over address the issues of coastal resource management pollution abatement and amelioration of coastal hazards through a set of management practices, legal and administrative means and through stakeholder compliance, as the coastal functions do influence global climate, and influence the local socio economic structures Since the coastal resource availability is influenced by pollution levels and coastal hazards, these two aspects are taken seriously, and the 'coastal area' demarcation is generally addressed in conjunction with the influence factors of the above This has resulted in the modern concepts of Coastal Area- River Basin Management Plans, which have been accepted by the EU and international agencies such as IUCN, LOICZ (under UNESCO) etc However, the experts assigned to the present committee appear insufficiently aware of the new global trends in coastal management schemes Once administrative boundaries are accepted in management schemes, the essence of coastal hazard mitigation efforts lose their significance This is a big lacunae of the report Absence of a proper reference lists both in the case of international practices, and in the description part of India's coastal geomorphology is quite glaring

The committee's view to permit mining of placer

minerals (in place of the earlier rare mineral categorisation) without LIA is meant to benefit some of the business interest groups. The apprehension is strengthened by a recent attempt along the tsunami hit Kerala coast to mine low grade black sand resources from the thin barrier beaches that protect the Kuttanad marshes from sea incursion by business groups without any thought for the future of the landscape. The committee that recommended inventorisation of bioresources of the coasts by the Botanical and Zoological Surveys is shy on involving proficient agencies like Geological Survey of India (GSI) in geomorphic mapping, Survey of India in demarcation of HFL/LTL, the Hydrographer's office and NIO in marine surveys and bathymetry and Central Ground Water Board (CGWB) in coastal ground water surveys and groundwater regime change modelling.

India's vast coastline's diverse nature, different vulnerabilities, resource potential, degradation status, and coastal sea characteristics have not found proper place in the recommendations. This is presumed to be due to the

chosen mix of expertise. As in the U.S., we need to bring in all the national agencies to work on this theme if we are serious about CZM. Creation of new institutions alone is not sufficient to address the magnitude of the coastal problems/issues. The zonation proposed is yet another instance of intended licence raj with attendant evils, sans scientific rationale. It appears that even the Dec 26, 2004 tsunami could not shake up the bureaucracy/technocracy establishments in the country. Ill conceived vulnerability mapping may result in panicking the coastal population, land price fluctuations and economic disaster in the coastal belt. Going by the tenor of the report, the committee is groping on this issue. Although, the coastal zone is defined to extend upto 12 nautical miles, the report is silent on all aspects of coastal sea parameters that influence not only the resource potential, but also the coastal risks.

*Centre for Earth Science Studies
Thiruvananthapuram - 695 031
Email: resource@md3.vsnl.net.in*

K SOMAN

Selected Bibliography

CICIN SAIN, B. (1993) Sustainable Development and Integrated Coastal Management. In: B. Cicin Sain and R.W. Knecht (Eds.) Ocean & Coastal Management, Elsevier Applied Science, 21, pp 11-43.
REPORT OF THE COMMITTEE chaired by M. S. Swaminathan to review the Coastal Regulation Zone Notification 1991. MoEF, New

Delhi, 2005, 115p (http://envfor.nic.in/met/crz_report.pdf)
SOMAN, K. (2005) Coastal landforms — reducing vulnerability. The Hindu Survey of the Environment, 2005, pp 19-23.
U.S. GEOLOGICAL SURVEY (2000) National Assessment of Coastal vulnerability to sea level rise. Preliminary Results for the US Gulf of Mexico coast.

WATER SPROUTING PHENOMENA OBSERVED IN PARTS OF ANDHRA PRADESH – AN EXPLANATION

Introduction

Though Andhra Pradesh has been facing severe water scarcity due to over-exploitation of groundwater resources, some reports have appeared in news/media during third week of January 2005 regarding water oozing on the surface and water level rise in the open wells. After a general reconnaissance to the reported sites of water level changes at different parts of the Andhra Pradesh, the phenomenon of water oozing seen at Mukindapur and Devanur near Tandur town in Ranga Reddy district were taken up for detailed scientific investigations.

Changes in the sea surface height of 0.2 to 0.4 m observed after the major earthquake and was interpreted due to the

redistribution of mass accompanied by huge tectonic event that could have altered the gravity field and geoid height (Hayashi et al. 2005). The fluctuations in groundwater level were observed after the major Sumatra earthquake (M9.3) from the other side of the globe (Fuqiong et al. 2005, Pore, 2005 and Hosteler, 2005), but there were no reports of any permanent changes of water level (Singh et al. 2005) from the water oozing sites. Rao et al. (2005) have attributed the hydrological changes seen in the area to the adjustments in the upper part of the crust after the major earthquake. The logic was that this might have led to sudden changes in the weathered/fractured zone leading to enhanced connectivity or compression and hence the water migration from the