

ABSTRACT

Coastal zones are widely exposed to different environmental factors such as sea level rise (SLR) wind-wave action, coastal slope, bathymetry and geomorphic features, tropical cyclones and associated storm-surges, salt water intrusion etc. The anthropogenic intervention with increased population and infrastructure, and lack of basic facilities additionally increases stresses upon coastal zones. Over the years, importance of coastal zones has fairly increased and one needs to acknowledge the regional level stresses and their transferability throughout. The coastal vulnerability assessment is not related to one particular parameter, but comprises a combination and influence of different parameters with one single motive. The common theme would be to analyse and describe the elements that determine the vulnerability rate of coastal systems and their response to climate change. The present study aims to improve the understanding of coastal vulnerability with respect to parameters at the regional level and also develop a coastal vulnerability map with different hazards and risks. This is accomplished starting with the influence of climate features ENSO and IOD on sea level variations and the sea level climatologic trends along the Indian coastal states using the tide-gauge data. The Indian coast, especially, Sundarbans along the WB (West Bengal) coast is highly susceptible to natural disasters and highly vulnerable to SLR and tropical cyclone induced storm-surges. One of the major hazards over WB coast is shoreline shift and its influence on the local geomorphologic setting. Lower coastal elevation levels along with high population density makes this region highly vulnerable. Consequently, a comprehensive assessment of integrated coastal vulnerability for WB is developed. One prime factor included in the integrated vulnerability index is, salt water intrusion that shows varying impact over the coastal zone. Addition of social parameters further enhanced results for the management and adaptation policies at regional level. This result clearly brought out the vulnerability variability range at closer proximity. Especially in North-24-Parganas region it is distinctly visible. Overall, the study recommends that understanding the coastal zones is a need and necessity especially in context to changing climate scenario that requires regular monitoring specifically over the low lying and ecologically sensitive regions.

Keywords: *Vulnerability, Coastal Management, CVI, shoreline change, sea level rise, Coastal inundation, salt water intrusion.*