

Review Article

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An Overview of Integrated Coastal Zone Management (ICZM) of Bangladesh

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ABSTRACT

This research was conducted Bangladesh (BD) and revised as an especial task study and review perspective of the coastal conditions and the features thus determine and critical analysis of integrated coastal zone management (ICZM). The coast length of Bangladesh is 710 kilometers wide. The coastal and ecosystem and habitats of the different animals are mostly depend on the features of coastal ecology and data analysis of both countries which have different strategies and techniques for the conservation of coastal biodiversity which were focused and brought together. Bangladesh coast contains vast biodiversity which are supported by the shingle beaches & sand dunes. The main features of the physical characteristics are the creeks, a lot of channels with crossing line, deltas of Ganges tidal plan with very low topology and mangroves. Integrated Coastal Zone Management (ICZM) in Bangladesh are greatly different because of variation in advanced and developed technology and the system of the creating legislative recommendations also varies; which could determine changes in sea level and coastal resources as well as habitats. This study targets to detect the background of coastal zone management (ICZM), scope, coastal development, challenges, environmental impacts, and necessary measures. Now, integrated coastal zone management (ICZM) is used for coastal development strategy in BD.

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Introduction

The coastal zone is that the interface between the land and sea, which comprised of a continuum of coastal land, intertidal area, and aquatic system as an example network of rivers & estuaries, inter-tidal places, salt marshes. The ruins of Ephesus was the well protected Christian city of magnificent buildings on the coast of Turkey, still carry the evidence of the first settlement of humans within the coastal. Marine tasks and works in Europe have taken 3-5% of GDP, whereas, shipping is employed for 90% of Europe's external business. Additionally, human activities are creating more impacts on the coastal zone and it's estimated that the maximum amount as 70% of the ecu coastline is very threatened as a results of direct and indirect human impacts [1]. The ocean carries 90 percent of international trade. For example: port cities were built throughout the Mediterranean by the Romans and ancient Greeks; in China the diversion of the Yangtze River occurred in AD 1128 and over 1000 years ago the mangrove areas on Phonpei, Micronesia Federated States, was reclaimed. In past all works of coastal environment were applied science. Modifying the water flow and sediment were the most activities of that point. Attention to social demand and ecological conservation were very little; there was way more concentrating on economic factors. Within the late nineteenth century the management concept of coastal ecology grew from the movement of national parks. Within the late 1960s to early 1970s the u. s. of America (USA) Coastal Zone Management Act led to the creation of different categories under the poster of

coastal zone management. To identify the approaches to Integrated Coastal Zone Management of Bangladesh with a view to creating recommendation for future development of strategies with regard to predicted changes in water level. This study was conducted to spot the current Coastal Zone Management strategies of the Bangladesh; to match the approaches in Bangladesh (BD); to spot the risks posed by predicted water level rise and changes in weather patterns.

Materials and Methods

This study was conducted by secondary information & data. For collecting, secondary data, a major review of literature associated with statistical coastal demography, status of coastal development, processes of coastal zone management, resources of coastal area, coastal zone (CZ) related anthropogenic impacts, surveys of coastal government, statistics of agricultural issues in Bangladesh perspective were conducted by online and offline communications. Moreover, relevant gazettes, documents of policy & reports of government were also collected from government agencies by personal communications. The secondary data & graphic illustrations was also collected from original researchers with permission & open sources software, R, python & ArcGIS; MS Excel are also used for data manipulating and analysing. In order to data analyze, the "content analysis" method was used. This method is a research tool for interchanging and coding textual material such as documents, oral communication, interviews, books & graphics obtaining meaningful information over different themes.

Coastal zone of Bangladesh

Position of the slope of Bangladesh is from North to South &

the length of coast of Bangladesh is 710 km long. The surface area with regards to the coastline is 47,201 km² which carries 32% of the landmass of Bangladesh. Districts are Bagerhat, Barguna, Barishal, Bhola, Chandpur, Chittagong, Cox's bazaar, Feni, Gopalganj, Jossore, Jhalakhati, Khulna, Lakshimpur, Narail, Noakhali, Patuakhali, Pirojpur, Shatkira and Sharitpur [2]. Exposed coasts are directly face to the ocean and are at high danger of anticipated water level rise and 370.4 km coastal area are covered by water [3]. Total 32 species are present within the Bangladesh coastal zone. Maximum people within the coastal area live under rural conditions and 52% are classified as poor and 24% as extremely poor [4].

Effect of Sea-level rise on the Bangladesh coast

Bangladesh contains a large population and this huge populated coastal country is very at risk of water level rise. Warrick et al. indicates the temperature change problem of Bangladesh (BD) by the representation of social, physical & legal framework [5]. Perspective of Bangladesh ecology, biodiversity, agriculture, coastal resources, water resources and human health will directly effect by global climate change problem [6]. Per 100 years the temperature range are increasing between 0.2 to 0.7 degrees Celsius were recorded by different lookout of Bangladesh (BD). This increasing temperature are directly affecting of coastal region on water system and ecological systems. The globe Bank showed that within 2020, 2050 and 2100, sea level is probably going to extend 10cm, 20cm and 1m and at the identical time landmass are loss of twenty-two, 4% and 17.5% respectively in Bangladesh [7]. By 2030, the ocean level of Bangladesh may rise by 1.5m which will affect 17 million people with 22,000 km² of landmass lost [8].

Mangroves protects coastal area of Bangladesh

The degradation rate of mangrove forest in Sitakunda is comparably less than the mangrove degradation of Noakhali mangrove forest. The main cause there is the land encroached by the 'land grabbers' explain and local community. In 1991 the cyclone in the Chittagong region took approximately 2.5 million lives [9].

Coastal Characters of Bangladesh

- The coastline of Bangladesh is 710km long.
- Bangladesh contains three coastal regions which are the western, central and eastern region. Creeks, numerous channel with crossing line, deltas of Ganges tidal plan with very low topology are known as western region.
- The major rivers in Bangladesh that carry fresh water to the estuary are Ganges, Brahmaputra and Meghna.
- The coastal zone of Bangladesh contains diverse ecosystem with estuaries, sand dunes, mangrove, islands, ecologically critical areas and a World Heritage Site.
- The major biodiversity of Bangladesh coastal areas are contained in the largest mangrove forest of western region. Coral reefs in Saint Martin's Island also contain great biodiversity.

Integrated Coastal Zone Management

ICZM could be a dynamic, continuous and interactive process design to push the sustainable management of coastal zone where economic development and human use of coastal zone are the long run focus. ICZM deals with the get pleasure from processing, protecting and restoring of the coastal zone.

Government plans and steps for coastal zone management

Bangladesh has taken the subsequent initiatives to further area specific management within the coastal zone of Bangladesh, the

event board of off-shore islands (1997-1982); UN/ESCAP-GoB Coastal Environmental Management plan for Bangladesh at 1987; BD National Conservation policy (1987); Coastal zone Resource Development Plans (1988); Parliamentary Committee with special members on Coastal Area Development (1988-1990) and National Capacity Building Approach - The Initiative of ICZM at 1997.

Project for marine licensing in order to make decision

The system of marine licensing reform is proposed in the marine and coastal access bill. Marine and coastal related bill will asset to keep the marine resource. National policy statement and marine policy statement is that the base of marine plans.

The Policy of Coastal zone Bangladesh, 2005

The Coastal Zone Policy was approved on 17th july, 2005 in Bangladesh by a cupboard meeting. This document took two years to formulate by a multilevel consultation. Different sectors of the Bangladesh government participated to create the structure of coastal zone policy.

Strategic policy for coastal zone management

The coastal zone policy describes nine strategic policies for the event of coastal zone areas, these were, to confirm the supply of safe and fresh water; provide more importance on disaster management; optimize the coastal land use for improving the regional economy; make employment opportunity within the non-farm rural sector for economic stability; management of natural resources in sustainable way; emphasis on livelihood opportunities for coastal communities especially for women; emphasis on conservation for environment; give importance on ICZM base knowledge management for empowerment and widen the institutional capacities to support the ICZM [2].

Institutional development for ICZM. Implementing and co-ordinating the process of ICZM are governed centrally where planning and framework are executed by Ministers and different agencies. The putting in place of any new institutions are not the intention of ICZM in Bangladesh although it's searching for a ideal model of excellent practice by giving priority to Partnership Practice at grassroot levels for integrated planning & management [2].

ICZM structure for National Level

At the national level of structure, front agencies get most priority to implement and plan the framework of ICZM at lower level. in an exceedingly project or program where integrated management are set by institutional process, front agencies convince the investors by showing how a project are often beneficial if they set a typical goal. The national level structure is connected to focal points and program co-ordinate units, an inter-ministerial commission, the national water resource council and the inter-ministerial technical committee [2].

Local level structure of ICZM

At the district, upazila and union level the administration is go by the representative of individuals with government support. CDS go through the representative of local level. CDS also work with the existing structure of regime within the absence of an elected representative. The most focus of CDS at the level of local is to motivate local people to participate and implement in activities.

Delta plan 2100

The government of Bangladesh in cooperation with Netherlands jointly have explored the likelihood of drawing up a delta plan for Bangladesh which is integrated and holistic plan, to create sure safe living and sound economic development in Bangladesh. This

will provide a whole strategy for development of delta project for next 50 to 100 years. it'll be a road map towards of coordinated and prioritized investment in land and water management, Keeping up-to-date with latest knowledge, proceeding to the desired future in 2100.

Discussion

Land squeeze in one in every of the foremost problem for coastal habitats loss, especially of saltmarsh and mudflat; these are moving inland become squeeze due to seawall protection. Uses of pesticides are the one in all the intense explanation for biodiversity loss in Bangladesh coastal areas. Coasts near the cities or ports especially in Chittagong region are stricken by high level of pesticides that are indirectly responsible to vary the coastal water circulation pattern. During this case Bangladesh government should encourage local farmer to use plant food. In Cox's Bazar and Sundarban the tourism sector is vital in Bangladesh. Create a typical, inclusive, and documented knowledge domain for water, land, and related natural resources, in addition as spatial planning within the Bangladesh delta with emphasis on water, land, agriculture, public health, environment, disaster management, food security, economic process, and spatial and ecological development, and using this information base to undertake integrated analyses and scenario building with the most stakeholders. Develop a Delta Framework and prepare a draft Act to ascertain a Delta Framework encompassing necessary and prescribed reforms of the present institutional framework moreover because the involved governmental organizations so that they are prepared to formulate BDP 2100 and implement the plan in an integrated, targeted, inclusive, broadly supported, and transparent manner.

Conclusion

Coastal management approaches rely on the knowledge available on various aspects of coastal ecosystems, processes, resources, natural hazards and their impacts, effective response by government. Coastal zone management is the important for applying sustainable development strategy in Bangladesh. The foremost important is to own interlinked among the national level, sub-national level and native community in any approaches that might ensure safety, security and sustainability for the coastal communities. Bangladesh government already has taken integrated project named Delta-plan 2100 for sustainable development in present and future. Especially water level rise will effect and threaten the foremost vulnerable sectors of society and therefore the natural environment. it's important to introduce different salt tolerant species into the fish farming and agriculture sectors to mitigate the food crisis likely to be caused by water level rise and saline water inundation. Sufficient system and embankment should be created to safeguard the coastal areas. Biodiversity is another important factor for coastal ecology so more research is required to safeguard the coastal biodiversity from upcoming events [9-20].

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Declare the conflict of interests

The author declared no major conflict of interests with respect to the publication of this article.

References

1. Bryant R, Tyler AN, Gilvear DJ, McDonald P, Teasdale I, et al. (1996) A preliminary investigation into the VNIR spectral characteristics of inter-tidal sediments.
2. WARPO (2006) Coastal Development Strategy; Approved at

the 2nd meeting of the Inter-Ministerial Steering Committee on ICZMP held on February 13, 2006. Water Resources Planning Organization, Ministry of Water Resources, Government of Bangladesh. February 2006.

3. UNCLOS (1982) United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982.
4. BBS (1999) Statistical Yearbook of Bangladesh. Bangladesh Bureau of Statics, Dhaka.
5. Warrick RA, GJ Kenny, GC Sims, NJ Ericksen, AK Ahmad et al. (1996) Integrated model systems for national assessments of the effects of climate change: applications in New Zealand and Bangladesh. Water, Air and Soil Pollution 92: 215-227.
6. World Bank (2001) Bangladesh: Climate Change & Sustainable Development World Bank office, Dhaka.
7. World Bank (2000) Bangladesh: Climate Change & Sustainable Development. Report No. 21104 BD, Dhaka.
8. UNEP (1989) Retrieve from <http://www.grida.no> Accessed on 28 September 2010.
9. BCAS (1992) Cyclone 1991 Revised. A follow-up study. Bangladesh Centre for Advanced Studies (BCAS), Dhaka.
10. Alexander LV, Tett SFB, Jonsson T (2005) Recent observed changes in severe storms over the United Kingdom and Iceland. Geophysical Research Letters 32, L13704.
11. Brammer H, Asaduzzaman M, Sultana P (1993) Effects of Climate and Sea-level Changes on the Natural Resources of Bangladesh. Briefing Document No. 3, Bangladesh Unnayan Parishad (BUP), Dhaka.
12. Bray H (2008) 2006-based national population projections for the UK and constituent countries.
13. Population Trends 131, 8–18, Available at: http://www.statistics.gov.uk/downloads/theme_population/PopulationTrends131web.pdf.
14. International Journal of Remote Sensing 17: 405-412.
15. Burd F (1991) Erosion and Vegetation Change on the Saltmarshes of Essex and North Kent between 1972 and 1988. Research & Survey in Nature Conservation, No. 42, Nature Conservancy Council, Peterborough.
16. Burgess K, Jay H, Hosking A (2004) Futurecoast: predicting the future coastal evolution of England and Wales. Journal of Coastal Conservation 10: 65-71.
17. Church J (2007) Global Sea Level. Past, present and future, Reprint from IOC Annual Report, 2006.
18. Journal of Coastal Research, Special Issue 39, 2004.
19. Cicin-Sain B, Knecht RW (1998) Integrated Coastal and Ocean Management: Concepts and Practices, Island Press, Washington DC.
20. Willis JK, D Roemmich, Cornuelle B (2004) Interannual variability in upper ocean heat content, temperature, and thermosteric expansion on global scales. Journal of Geophysical Research 109: C12036.

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