

COASTAL ZONE ECOLOGICAL DEVELOPMENT, MANAGEMENT AND STATUS; AN ENVIRONMENTAL STUDY OF BANGLADESH

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Abstract

Coastal Zone (CZ) is the region where land, ocean and atmosphere interact with each other hence it is dynamic and diverse in nature. This zone is being continually attacked by cyclones, sea level rise, storm surge which have caused terrible impacts on this low-lying coastal area. The complex and active southern zone needs to manage and requires an integrated holistic approach. This study aims to identify the background of southern zone management, scope, the rationality of southern development, challenges, framework, environmental impacts, and future trends. Currently integrated southern zone management is mainly used for southern development strategy in Bangladesh. Coastal Zone of Bangladesh requires an integrated management to establish a mutual interaction among southern community, policy, environment to achieve sustainable development of Coastal Zone. Coastal Zone has development opportunities that can reduce southern poverty and contribute to the local and overall economic development of Bangladesh. The zone has diversity of natural resources, minerals and tourism potential and much more to explore. Bangladesh already has taken ocean governance initiative.

Keywords: Coastal Zone, Development, Management, Environment. Issue, Ecological.

INTRODUCTION

With a population of over 80 million, Bangladesh is the most densely populated country in the world. The population density, according to the most recent estimates, is 615 persons per 1cm² for the country as a whole and 1,063 persons per 1cm² of arable land. The country is predominantly rural, and the bulk of the population still lives in some 71,000 villages with fewer than 7,000 people in each.

The urban population constitutes less than 10 per cent of the total. Over half of the population suffers from malnutrition, while intestinal diseases and parasitic maladies such as malaria are commonly prevalent. Over-population is a major problem in the country and the need to control population growth (estimated at about 2.9 per cent per year) is urgent. Large and growing numbers of people exert increasing pressure on the limited resources of the country.

Most of the arable land is under Cultivation; forests are fast dwindling because of large agricultural expansion and the need for a fuel wood supply. Wildlife numbers have decreased considerably because of a shrinking habitat due to human encroachment. The country also suffers from harsh weather; heavy monsoon rains periodically cause floods and bring cyclones resulting in devastation to human settlements in the low-lying coastal

areas and deltaic plains. Geographically, Bangladesh can be divided into two principal areas: the low-lying deltaic alluvial plains which comprise the bulk of the country and the much smaller area of Chittagong hill tracks to the south-east.

Bangladesh is a land of rivers which dominate the landscape, and most of the country is comprised of a triangular, nearly-level alluvial plain, much of it deltaic in nature and reputedly the largest delta in the world. The delta is cut up by three great river systems viz., the Ganges-Padma, the Brahmaputra-Jamuna and the Meghna.

The rivers play a dominant role in both the economic and social life of the country. The Bangladesh Plain, also called the Lower Gangetic Plain, lies between the Indian Foothills of Himalayas to the north and the Bay of Bengal to the south. In its lower reaches the deltaic area is composed of many temporary, semi-permanent and permanent islands, locally called chars, formed by the network of rivers. The land characteristics of the Bangladesh Plain, running from north to south, have been concisely described as 'old mud, new mud and marsh' (Nyrop, 1975).

The Plain is also sometimes classified into old alluvium and new alluvium. The new alluvium, which occupies about three times the area of the old alluvium is economically more productive because it receives deposits of fertile soils carried by the rivers. The old alluvium consists of older alluvial deposits and is generally higher in elevation and less fertile than the new alluvium (Ahmed, 1976).

The extreme southern reaches of the Plains, extending from the Indian border eastward to the Padma-Meghna estuary, consist of a forested, tidal-washed salt marsh region known as the Sundarbans, which is overgrown with mangrove forests, reputedly the largest single mangrove forest block in the world. No less than one-third of the total population of the country is, in one way or another, dependent upon the mangroves for their livelihood. The inland waterways constitute the most important means of navigation and communication throughout the country.

MATERIALS AND METHODS

This study was based on secondary information and data. To collect secondary data, an intensive literature review related to coastal demographic statistics, coastal development status, coastal management approaches, coastal resources, coastal zone related anthropological impacts, coastal government surveys, agriculture statistics issues in Bangladesh context were conducted through an online and offline. In addition, relevant, gazettes, policy documents and government reports were also collected from government agencies through personal contacts.

The secondary data and graphic illustrations also were collected from original researchers with permission and open source software python, R and ArcGIS, MS Excel are used for data analysis and visualization. For data analyses, the "content analysis" method was used. This method is a research tool for interpreting and coding textual material (e.g. documents, books, oral communication, interviews, and graphics) to elicit meaningful information over different themes.

months) would increase by 29% (from the base year 2000) due to 88 cm SLR. The total amount of salinity affected land in Bangladesh was 83.3 million hectares in 1973, which had been increased up to 102 million hectares in 2000 and the amount has raised to 105.6 million hectares in 2009 and continuing to increase.

With 50% of the land less than 8 m above sea level, and a coastline of some 600 km, coastal flooding is a common problem. Bangladesh is especially helpless to tropical cyclones with around 718,000 deaths from them in the past 50 years.

The western coastal zone is particularly vulnerable to surge flooding due to its low-lying land and very poor defiance against surge waves. A GIS based study showed that a total of 1183 km² of land has eroded with rate 118.3 km² /year from 1995 -2005 and 1194 km² from 2005 to 2015 around central part of Bangladesh coastal zone. Major erosions occurred in the areas of Meghna estuary and along the coasts of major islands such as the eastern coast of Bhola, the northern coast of Hatiya and the south-western coast of Sawndip.

The future vulnerability in the coastal zone of Bangladesh will be significantly higher than present condition. Natural disasters such as cyclone, storm surge, floods, and drought will be more frequent and intense in the future.

The climate vulnerability will be enhanced in the southern region of Bangladesh due to geographic settings, dense population, and poverty. central and western part of coastal areas are more vulnerable because western part mostly covered Sundarbans, but it is low lying land areas, other central part is more dynamic part of the southern zone of Bangladesh.

Incorporated Coastal Zone Administration Approach

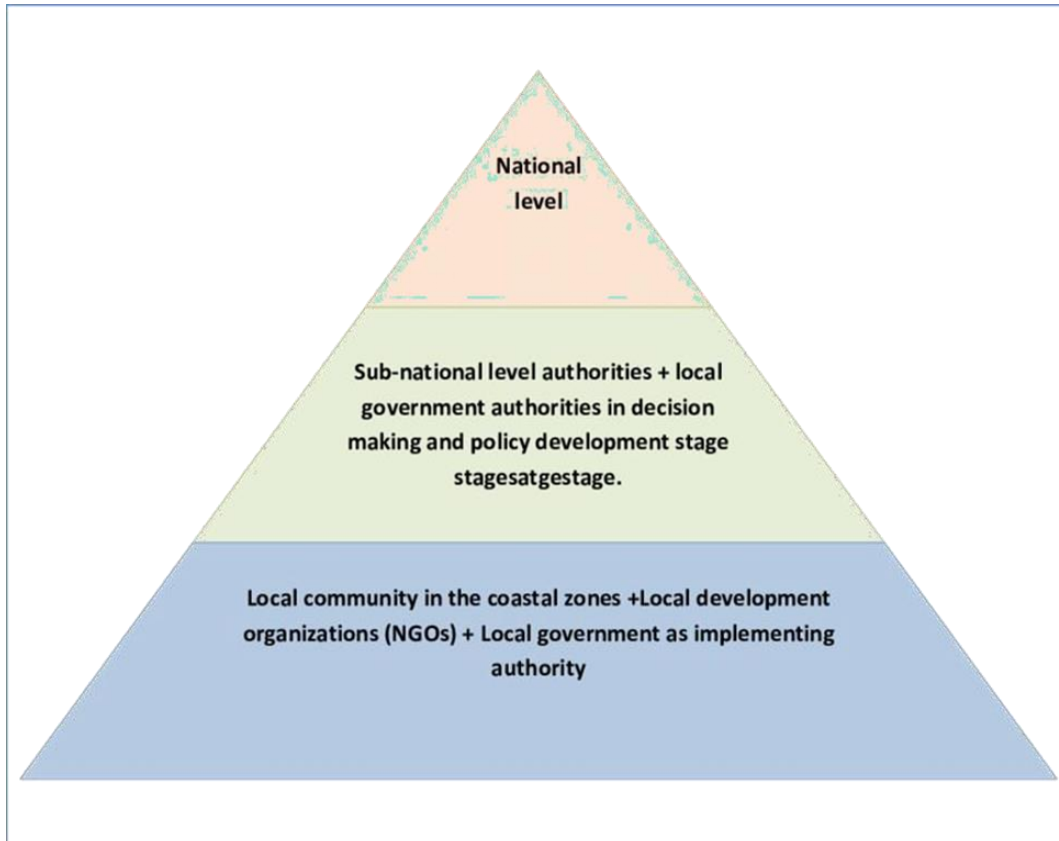
Coastal Zone administration approach is a widely accepted approach at all levels of governance as a means of delivering sustainable development in the southern areas.

Southern zone administration approach refers to ‘ a dynamic, continuous and iterative process designed to promote sustainable management of southern zones which covers full cycle of information collection, planning, decision making, management and monitoring of implementation’.

Coastal Zone administration is to provide for the best long-term sustainable use of coastal natural resources and for perpetual maintenance of the most beneficial natural environment.

It unites government, community, management, sartorial interests for the protection and development of coastal ecosystems and resources. People’s participation is always requirement in any development program Coastal zone administration approach ensures it in effective way.

Current Standing and Future Inclination of Coastal Zone Administration and Management Approach



Source: Research Gate- 22

Newly Southern zone administration approach, development and planning have received serious attention by BGD. The Coastal Zone administration approach not only helps mitigate the effects of disasters, but also provides opportunities for sustainable resource utilization. Coastal Zone administration approach in Bangladesh is not just for environmental or ecological gain but provides a survival strategy for millions living at the mercy of nature. The adoption of the 2005 Coastal Zone Policy and strategy in Bangladesh was a significant step towards implementing coastal zone administration approach.

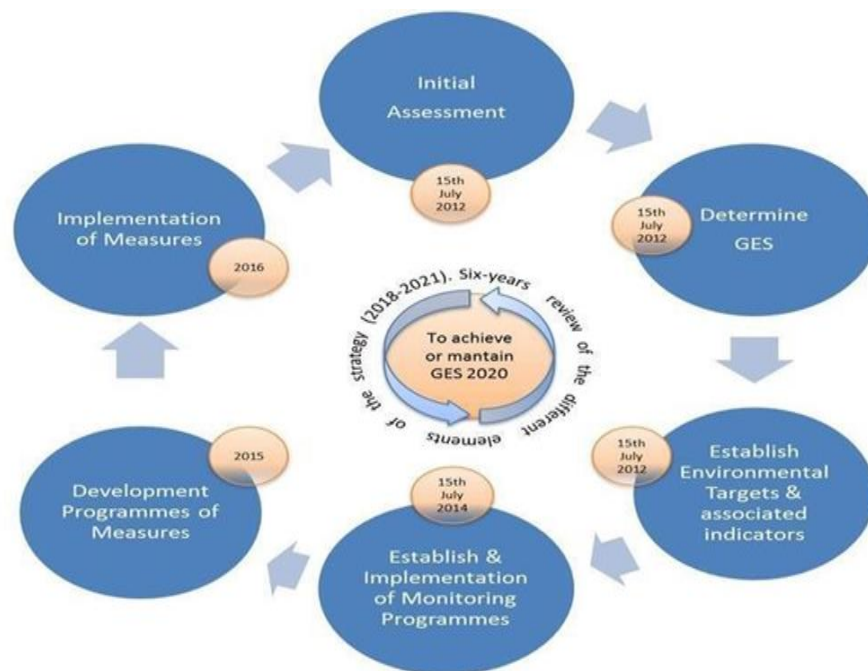
The Coastal Zone administration Policy of 2005 was adopted with the overall goal to create conditions in which the reduction of poverty, development of sustainable livelihoods and the integration of the coastal zone into national processes can take place. Coastal Zone administration Policy aimed: 2013 and future (2050) climate vulnerability in southern areas of Bangladesh. 4 Ahmad, et al. OPEN ACCESS Freely available online J Coastal Zone Manag, Vol. 22 Iss. 1 No: 466 to provide a general guidance to all concerned for management and development of the coastal zone administration approach in a manner so that coastal people are able to pursue their life and livelihood has failed to

show any great promise There were some reasons such as (i) Failure to incorporate professionals qualified in coastal zone administration approach, (ii) unreasonably land-centric view of the coastal zone, (iii) failure to assemble a regular workforce etc

Schemes of Bangladesh for Coastal Zone Administration Approach

Several enlargement initiatives have lately been taken and some are in the process of being initiated in different sectors, namely shipping, fisheries, environment, research, etc. to either boost economic growth or to manage the capital resources more sustainably. Recently Bangladesh oceanographic research institute founded for coastal and oceanic research of all kinds. Several Ecologically Critical Areas (ECA) have been enforced in various coastal ecosystems to maintain critical habitats, biodiversity, marine turtle breeding and conservation, and mangrove restoration and growth. Mangrove afforestation in newly accreted intertidal areas has been going on for decades now.

Marine Control Agenda



An incorporated Southern and marine control agenda for Bangladesh has been proposed in the 7th Five Year Plan (2016- 2020) of the country by the Planning Commission of Bangladesh. This is made for southern and ocean affairs for Bangladesh. This is the first holistic southern and ocean management policy framework that includes the ocean as part of integrated southern and ocean management. This structure can be further extended to include cross border and, regional collaborations especially in the environment, river and island management, conservation and scientific research. After completing all related tasks, health of southern community, coastal biodiversity, coastal protection and coastal livelihood have been enhanced

Delta Plan 2100

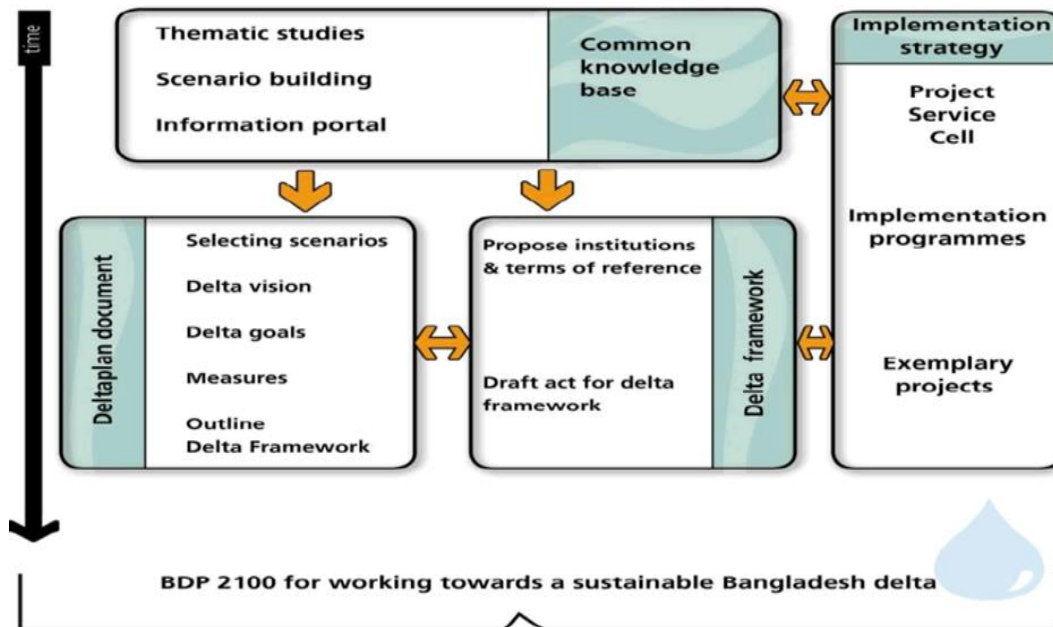


Figure 6: overall process of delta plan [27].

In cooperation with Netherlands, the government of Bangladesh jointly has explored the possibility of drawing up a delta plan for Bangladesh which is integrated and holistic plan, to ensure safe living and sound economic development in Bangladesh. This will provide a complete strategy for development of delta project for next 50 to 100 years. It will be a road map towards of coordinated and prioritized investment in land and water management, continuously bringing in latest knowledge, leading to the desired future in 2100.

Precise Goals

Sustain an enabling sociopolitical climate so BDP 2100 can be formulated and implemented, Create a common, inclusive, and documented knowledge base for water, land, and related natural resources, as well as spatial planning in the Bangladesh delta with emphasis on water, land, agriculture, public health, environment, disaster management, food security, economic growth, and spatial and ecological development, and using this knowledge base to undertake integrated analyses and scenario building with the main stakeholders. Develop a Delta Framework and prepare a draft Act to establish a Delta Framework encompassing necessary and agreed upon reforms of the current institutional framework as well as the involved governmental organizations so they are prepared to formulate BDP 2100 and implement the plan in an integrated, targeted, inclusive, broadly supported, and transparent manner Create with the main stakeholders a delta vision, goals, and measures that use a policy-making process that is adaptive, inclusive, and transparent, ensure the transparent input of both the public and private sector, and provide the anticipated results in the BDP 2100. Facilitate entrepreneurship of the private sector, including multinational companies, small- scale

and medium enterprises, and NGOs, in Bangladesh and in The Netherlands for ideas, concepts, and innovations that contribute to the BDP 2100 through links to public institutions and other relevant organizations in Bangladesh and that promote short-term regional and sartorial developments leading to appropriate future governance of water, land, and related resources as well as spatial planning in Bangladesh delta.

CONCLUSION

Coastal zone administration approach is very challenging because it must address related all issues in socioeconomic and natural but is very important in Bangladesh coastal zone that holds one thirds population of Bangladesh are now standing in a multiple challenges. The output of coastal zone administration approach is not satisfied. Coastal Zone administration approach depends on the information available on various aspects of southern ecosystems, processes, resources, natural hazards and their impacts, effective response by government. Southern zone administration approach is the essential for implementing sustainable development strategy in Bangladesh. The most important is to have interlinked among the national level, sub-national level and local community in any approaches that could ensure safety, security and sustainability for the southern communities. And Bangladesh government already has taken integrated and holistic project named Delta plan 2100 for sustainable development in at hand and outlook.

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