**International Journal of Research in Economics and Social Sciences (IJRESS)**
Available online at: http://euroasiapub.org
Vol. 7 Issue 11, November- 2017
ISSN(o): 2249-7382 | Impact Factor: 6.939 |

# CHANGING SCENARIO IN BAKKHALI AND FRASERGANJ COASTAL AREA

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**Abstract:**
*Bakkhali and Fregergunj covering four Mouza or villages is the southern tip of the South 24 parganas of West Bengal faced to Bay of Bengal. This coastal area has dynamic physical and socio-cultural environment. Before twentieth century it was covered by mangrove forest. The environment was starting to change due to reclamation of land. The reclamation process was present till half of twentieth century. After that both physical and socio-cultural scenario were continuing to change due increasing population and initiation of tourism activity. This paper is focused on changing scenario of this coastal area from decade of sixty in twentieth centuries's to present day. The paper revealed that there are lot of physical changes have been taken place. Socio-cultural changes have been seen simultaneously. Major physical changes are shoreline shifted, forest area decreased and converted to fishery etc. Population, literacy, livelihood pattern, tourism also have been changed. Study was based on secondary data and chronological maps. A descriptive type of research has been applied. It is found that the changing scenario of this area is most important and effected on life and living of people*
**Key words:** Mouza, Dynamic, Socio-cultural, Coastal area, Reclamation.

## 1. Introduction:

Earth surface and environment may changes time to time. Change can be as physical and socio-cultural. Physical as well as socio-cultural changes are made by both physical and anthropogenic factors. This coastal area is located at the confluence of Hoogly estuary. So morphology of this area is more dynamic and that is why shore line has been shifted due to coastal erosion and sea level rise. Coastal erosion is major geographical phenomena to show changing physical scenario. Sand dunes are encroaching towards the cultivation land. Deforestation and land use change is also significant changing scenario. After 1970, a major part of Henry Island Mouza covering dense mixed jungle has been changed to fishery pond. Almost 700 meter length of Bakkhali River has been decayed towards the Bay of Bengal. Tourism industry was introduced by govt of West Bengal. Agricultural land has been replaced by hotel and resorts and settlement during last 55 year. Infrastructure of the tourism industry in respect to hotels, restaurant, retail out late, tourism service, transport and communication etc dramatically changed due to increasing tourist during last 15 year. Before the fluorescent of tourism peoples were engaged with only agriculture and fishing, but tourism changed lively hood pattern. Per capita income has been increased. Working population is shifting from primary economic sector to service sector.

## 2. Study Area:

Bakkhali and Fresergunj coastal area is covered four Mouzas which are Amrabati, Lakshmipur, Fredrick Island and Henry Island under Fresergunj Gram Panchayet. It is also under the Fresergunj Coastal Police Station. Last two Mouza's are under reserve forest. Southern side of this area is facing toward Bay of Bengal. Eastern edge is touches Saptamukhi River. Northern part is totally connected with the land as Bijoybati Mouza. Western boundary limited by Edward Creek. The former Governor General, Andrew Fraser was the first man who putted feet in this area in year 1903 AD. The elevation of this area is almost close to sea level.

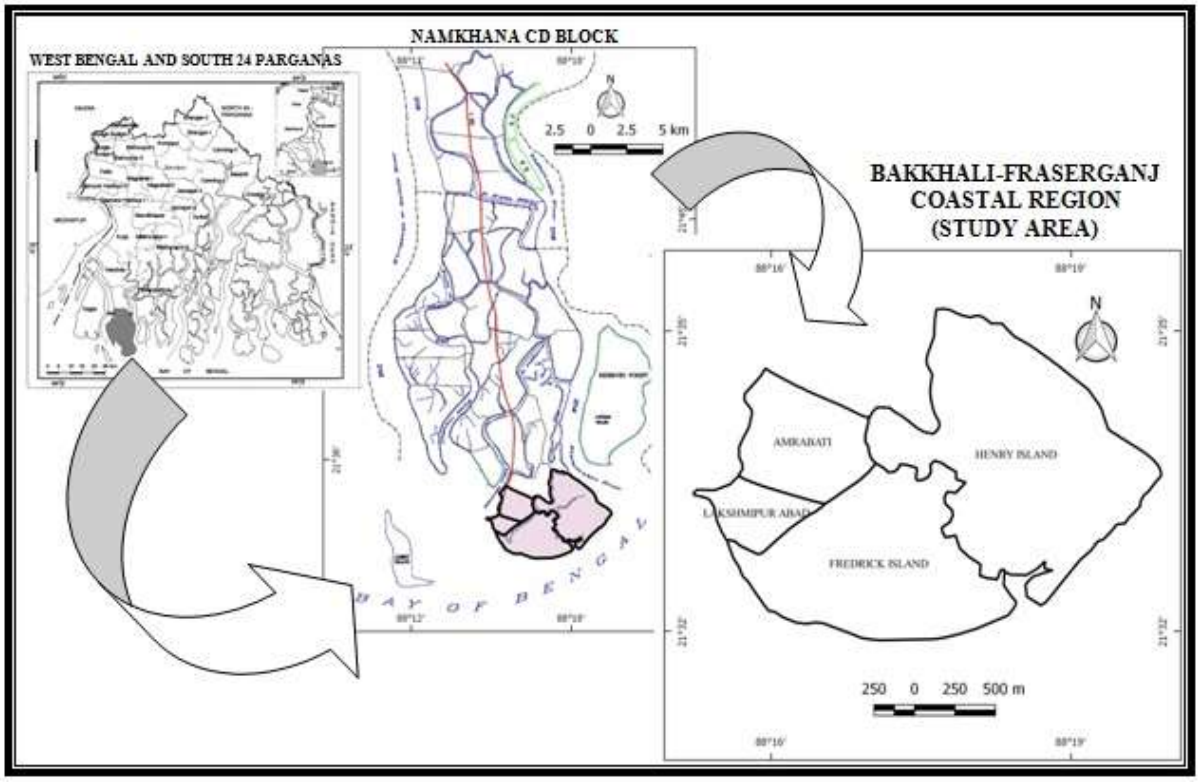


*Figure 1: Location Map of Study Area*

## 3. Objectives:

This study aims to:

- To investigate the changing scenario of physical phenomena.
- To assess the socio economic change of this area.
- To find out the characteristics of changing scenario of tourism.
- To study of major land use change scenario of this area.

## 4. Methodology:

The study was based on both primary and secondary data. Descript type of research method has been applied. The research was done by review of literatures and analysing primary and secondary data. There were maps and image like cadastral map, Topographical map prepared by Survey of India, Goggle Earth Image which has been used for temporal analysis of land use, coastal erosion etc. Google Earth Pro software was used to measure the major land use area. The Indian

Census Report of different year has been used for detection of demographic and socioeconomic change. Primary field survey was done for both physical and socioeconomic data collection. Field visit also was arranged by the author to get tourism related data.

**5. Administrative Change:**

Bakkhali – Fresergunj coastal area includes four Mouzas which are under Fresergunj Gram Panchayet. The area was under Namkhana police station up to 2010. Now it is under Fresergunj Police Station which is bifurcated from Namkhana PS and established in 2010. There is a police camp located at the end of NH-117 near the Bakkhali picnic spot. This camp maintains the security of tourists at Bakkhali sea beach area. ICG also took over the responsibility to give better security.

**6. Changing Physical Scenario:**

**6.1 Coastal erosion and shore line change:**

First of all, the coastal erosion and shoreline change are the most important physical changing phenomena in this area. The main reasons of the erosion are abandonment of sediment replenishing western distributaries of Ganga, due to eastward tilting of delta and offshore interception of westward transportation of sediments to the deep-sea Bengal fan by the Swatch of No Ground submarine canyon (Chakrabarti, 1995, Bandyopadhyay and Bandyopadhyay, 1996, Bandyopadhyay *et al.,2003*).

Photographic evidences reveal that the older dunes on Bakkali beach are getting eroded and the older mudflats lying in inter tidal beaches are getting exposed indicating rapid erosion (GSI, 2004) Increased tidal height and cyclonic activities in this area over the last few decades have damaged the topsoil which also indicating coastal erosion and shore line shifting (Gopal and Chauhan 2006; Kotal *et al.,* 2009).

The erosion of the mangrove-dominated reaches confirms that coastal retro gradation here is not linked to deforestation. Shoreline water table alteration, development intervention, other human induced land use changes, sediment characters and the high water level situations include the other factors of the shoreline erosion (Pahari, 2011).

The shorelines of Bakkhali and Fresergunj coastal area have been under constant threat from erosion and environmental degradation. This area shows significant erosion. Bakkhali and Frazerganj are twin beaches with plantations like casuarinas and coconut lining all along. Beaches in this area are of mud mixed sand, which makes the area unstable and more prone to erosion. The long shore current hits Frazerganj and Bakkhali tangentially and erodes the area. This coastal area might have contributed further to the erosion of soil made loose by human activities (Chatterjee *et al*., 2015).

After the superimposition of the SOI topographical mosaic map (1968), IRS-1D LISS-3+PAN merged image (2001) and Google Earth image (2015) coastal erosion and shore line shifting scenario has been explored. Major land lose mouza is Fredrick Island which loosed almost 50 % land in last 47 years. Lakshmipur Abad also loosed land area due to coastal erosion. Amrabati and

Henry Island affected moderately by coastal erosion. The significant impacts have been found in Lakshmipur Abad, because most of the affected peoples are belongs to this mouza (Figure - ).

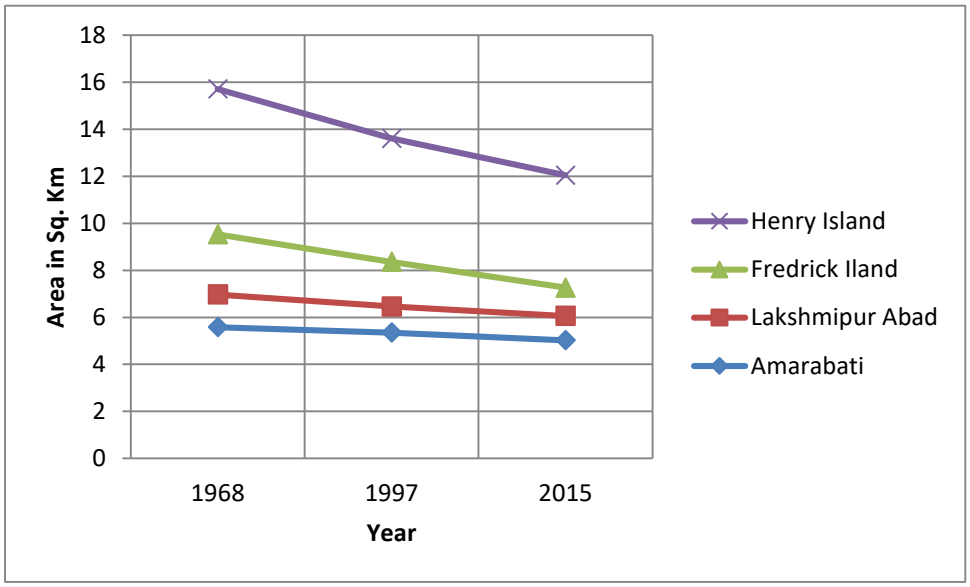


*Figure 2: Changes of area of four mouzas due to coastal erosion in sq. km*

**6.2 Change of dune morphology:**

Sand dunes at Bakkhali have mostly been eroded away by the sea in recent times (Ray and Baksi 1978; Chakraborty *et al.,* 1987). The initial mature dune height was 6-9 meters (Paul, 1987). One of the main reasons for this is the promotion of extensive casuarinas farm forests on the dunes. Previously the dunes used to keep pace with the retreating coastline by migrating landward. Planting vegetation made them stabilised and protect the coast prone to erosion. Dunes in the study area occur as a few discontinuous patches in the western sector between Bakkhali and Edward's creeks—mostly being confined in Lakshmipur. Their height varies from 3 to 7 m. Apart from these, low (1-3 m) and isolated dunes over supra tidal region, sand platforms also occur in the southwest, about half a kilometre along eastern bank of the Edward's creek estuary (Pahari, 2011).

The shifting of sand dunes is a geographical phenomenon in the coasts. The pattern of this extension can be traced from the satellite images along with regular monitoring through field survey. After the analysis of the satellite image and conversations with aged hotel owner of Bakkhali and its surrounding areas the coast line and its change can be clearly traced from the past to the present day. After the study, it has been found that the height of the dunes at specific place has been reduced. In fact, no large sized sand dunes can be observed along the coast line of Bakkhali.

**6.3 Land use change:**

Analysis satellite images and SOI mosaic topographical maps of Bakkhali and Fresergunj coastal

area from 1968 to 2015 have been studied to get a major land use change scenario. The Topographical map of 1968 showed Henry Island and Fredrick Island are totally covered by dense and mixed forest. The tidal creek Bakkhali River has been decayed between Amrabati-Lakshmipur and Fredrick Island. This tidal creek is visible with the pattern of ox-bow Lake. The mouth of this creek is very narrow shape. Major land use categories are forest, agriculture, settlement and others. Settlement area covered 0.77 sq.km but there is no hotel area. In comparison with Google earth image 2015, significant changes in land use has been found. Bakkhali creek has degenerated and converted to aquaculture. The marshy land with mangrove Forest of Henry Island has been destroyed and converted to aquaculture or fisheries. This is very significant change. Fredrick Island eroded and social forestry has been introduced. Hotels are developed along embankment which is now road. Another drastic change of agricultural land converted to hotel estate. Settlement area also increased after reclamation of this area. Fisheries and fishing harbour also constructed along the east bank of Edward creek. All land use changing scenario have been sum up in the following Figure 3.

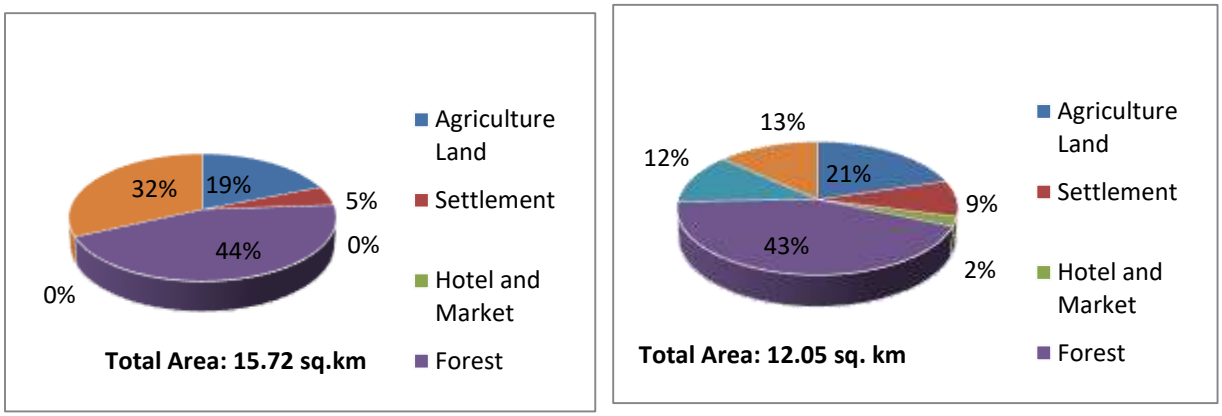


*Figure 3: Land use category in 1968 (Left) and 2015 (Right)*

## 7. CHANGING SOCIO-ECONOMIC SCENARIO:

### 7.1 Demographic change:

The present population of this coastal area is 7851 (2011 census). The growth rate of population which is 54.46 % has seen maximum in the decade of 1971-81 where as last decadal growth rate was 19.38 %. So it can be decided that total population is increasing and the growth rate is declining which is indicating to population characteristics is changing. This phenomenon is a good sign for coastal community.

*Table 1: Total population*

| Mouzas | 1971 | 1981 | 1991 | 2001 | 2011 |
|---|---|---|---|---|---|
| Amrabati | 2212 | 3346 | 4468 | 5565 | 6675 |
| Lakshmipur Abad | 384 | 637 | 781 | 938 | 1176 |
| Total | 2596 | 4010 | 5293 | 6576 | 7851 |

*Source: Census Report, 1971 - 2011*

Population density is another demographic component which is also determinant of socio-economic scenario. In this region population density is continuously increasing way according to year wise. It has been observed that population density is higher in Amrabati than Lakshmipur Abad. Amrabati belongs to very rapid increasing rate of population density than Lakshmipur Abad.

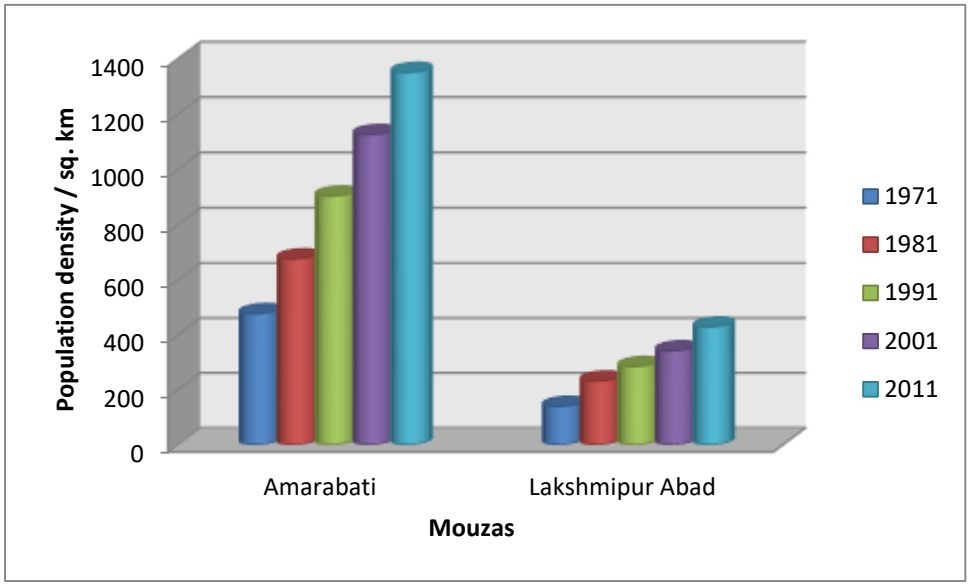


*Figure 4: Year wise Population density / sq.km (Calculated by Author)*

*The present total literacy rate is 70.48 % where literacy rate in India is 70.04%. It is showing that literacy is high and that can influence to develop the area. Literacy has increased up to more than double during 1971 and 2011. This changing scenario showing the coastal community people are getting education. They are engaging in tourism industry using education. They can play very important role to manage the environment and hazard in this area in future. There are two major changes have been observed such as in 2001 Lakshmipure was belong to more literacy rate than Amrabati but in 2011 Amrabati got highest literacy. Hare another interesting change has been observed that literacy rate has been declined during last decade or 2001 – 2011.*

*Table 2: Literacy rate to total population*

| Mouzas | 1971 | 1981 | 1991 | 2001 | 2011 |
|---|---|---|---|---|---|
| Amrabati | 30.2 | 30.4 | 42.8 | 55.2 | 72.04 |
| Lakshmipur Abad | 37.2 | 30.1 | 55.6 | 81.1 | 61.64 |
| Total | 31.2 | 30.6 | 45.1 | 59.6 | 70.48 |

*Source: Census Report, 1971 - 2011*

**7.2 Changes in tourism:**

In the year 1972 West Bengal Govt. has introduced first Govt. Tourist Lodge, named Bakkhali Tourist Lodge at Fradric Island on the eastern bank of a creak named Bakkhali. Then private hotels were established. There were only 26 hotels up to 2006. Field survey of 2017 is showing that there are total 78 hotels. So hotel establishment rate is growing rapidly.

Freserganj and Bakkhali are the two famous tourist spot located on same sea beach. Freserganj is located in Lakshmipur Abad mouza and Bakkhali tourist spot is in the both Frederick Island and Lakshmipur Abad mouza. The physical distance is approx 2 km only between the two spots. On the Namkhana – Bakkhali road, last 2 km road from Freserganj to Bakkhali was non-metal road. Then it has been converted to metal road. Now total Namkhana –Bakkhali road has been promoted to National Highway 117. Transport and communication system have developed as well. Once upon a time WBSEB supplied electricity only 4 hours in the evening. Now electricity is available for 24 hours.

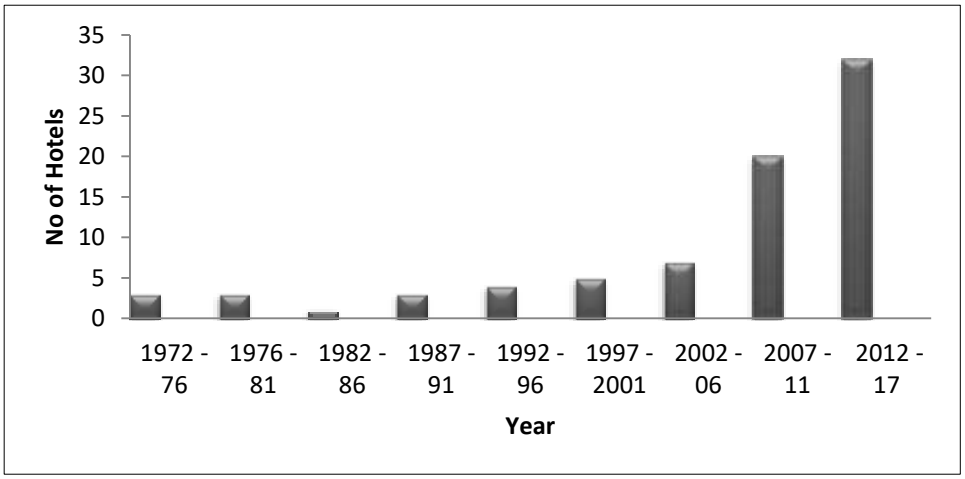


*Figure 5: Establishment of hotels with time phrase*

Market and food availability is sufficient now. After the Police Camp, there was only one retail shop up to 2002. After 2005 different types of retail shop have been established such as tea shop, Sea shell shop, Fish fry shop, stationary shop, Food & Fast-food Centre etc. Beach lighting has started. Street light have also inaugurated.

The other tourist spots related with Bakkhali also have developed. Tourist attractions are increasing way; tourism related to Jambudwip has been postponed.

**7.3 Economic and Infrastructural change:**

Peoples of this area basically depended on agriculture and fishing. But tourism brings new scope of different occupation and job. They are getting job in tourism related service. Some peoples have included in tourist transport or sight scene guide service. Some peoples have opened their own retail shop. Now most of the inhabitants have engaged with double economic activity such as agriculture and tourism or fishing and tourism or fishing and business etc. Land value has been increased. Per capita income also has increased.

Road network of this is very highly developed. The important roads are NH-117, PMGSY Road from Lakshmipur to Haripur, Jetighat to Henry Island road, Bakkhali-Henry Island road, Benfish Road

etc. All roads are metallic or concrete. Once upon a time these roads were made by bricks. Bakkhali and Freserganj coastal area is more potential for wind energy production. A project was launched around 2004-2005 AD. Then it promoted and enhanced. First times four wind meal were established and the electric production amount was 1 MW. It carried 3600 volt electric. After that again another four wind meal which had 1 MW capability were established. At present production has stopped. The generated electric served this coastal area and outside.

*Table 1: Changing tourism related economic activity*

| Tourism related economic activity | 2009 | 2017 |
|---|---|---|
| Paddle Van | 45 | 5 |
| Motor Van | 25 | 62 |
| Toto | 0 | 80 |
| Chair Business | 3 | 30 |
| Photography | 15 | 70 |
| Green coconut | 2 | 6 |

*Source: Field survey by Author*

**8. Conclusion:**

The above discussion reveals that changing scenario of both physical and cultural is being. The time line has taken from 1960s to present for this study. Coastal erosion and shoreline shifting is the major changing scenario which reduced area of coastal villages whereas coastal dune structure has been changed. Population growth rate has been declining for previous decades. In this study one interesting thing has been identified that literacy rate decreased during 2001 and 2011, but overall literacy rate has increased. The causes of this scenario have not been cleared. Economy has taken place a most important place in the changing scenario because of tourism industry. It has flourished and spread over this area after 1970s. Now tourism is playing an important role on the economic development of this coastal area. In respect to land use change, most of the agricultural land converted to hotel estate. Tourism infrastructure has developed as much as during last 50 years. Paddle van as a transport vehicle for tourist has been replaced by Motor van and Toto. Motor van replaced by Toto can be considered as an environmental friendly change. So, in the concluding remarks it can be say that the changing scenario would take place more and more different way.

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