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Alternative Livelihood Sources In Degraded Badagry Sand Lagoon Barrier Landscape

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Abstract: ***In recent years, the evidence for increased peril of climate-induced slow-onset e.g. sea level rise, and augmented intensity and frequency of rapid-onset disasters has emerged with greater certainty. The predominant impact has been on coastal communities with huge losses of life, livelihoods, property, and infrastructure. This paper explores the alternative means of livelihood in badagry littoral communities.***

Badagry is a typical sand barrier-lagoon coastal community with a population of 119,267 people and is characterised by 80km of unspoilt beaches fronting the Atlantic Ocean. The livelihood of these littoral people is dependent primarily on agricultural activities which environmental phenomena are causing accelerated rates of erosion and flooding, and as a result have direct effects on the livelihood pattern.

This study recognizes participatory research as a viable physical planning tool for community base tourism enterprise. Relevant primary data was obtained through a combination of two participatory research techniques including structured interviews and personal observation, and mapping using GIS as a design tool. Previous research works on coastal erosion in Nigeria, marine ecosystem and Lagos State regional master plan provides relevant secondary data.

The paper found out that the coastal process is recently made worse by the climate change powered ocean surge. The ecosystem is sparse coastal vegetation, holding together loose sandy soil formation along the Atlantic shoreline. The research concludes and recommends that the combination of the ministry of environment and ministry of physical planning and urban development should adopt a guideline policy and principles to emphasize on indigenous architecture for all cabins; unique linkage to the artisanal, fishing occupation; and conservation of native flora as ecological engineering approach to reduce ocean surge threats.

Keywords: Livelihood, Sand Lagoon Barrier, Coastal Landscape, Climate Change

I. INTRODUCTION

Davis (1994) described a barrier as a sandy island developed from a broadened barrier beach that is above high tide and parallel to the shore. Barrier system has dunes, vegetated zones, and swampy terrains that extend lagoon wards from the beach. They occupy 13% of the world's coastlines (Sikora and Kjerfve 1985) and are found along every continent including the Antarctica. The Coastal Barrier Resources Act (CBRA) of 1982 delineate a coastal barrier as all related aquatic habitats, including the adjacent swampland, marshes, estuaries, inlets and near shore waters, although these natural features have an inverse relationship with few man-made structures or activities which do not drastically encumber geomorphic and ecological processes. A coastal barrier can either be developed or undeveloped; this is related to the density of development and availability of infrastructure on the land above mean high tide. (CBRA, 1982). Lagos is located at the Western tip of the coastline of Nigeria. This location has really influenced the human and physical environment of Lagos. Of all the states in Nigeria, Lagos has the unique advantage of having the longest stretch of the country's coastline, is hallowed with 180 km out of Nigeria's 960 km coastline, which is about one-fifth of the total (Ojo,

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1999). Badagry community being the case study is characterised by 80km of unspoilt beaches fronting the Atlantic Ocean.

Carrada and Fresi (1988) observed that Coastal lagoons are dynamic ecosystems dominated and subsidized by physical energies. Lagoons are highly productive coastal features that provide a range of natural services that society values. Their setting within the coastal landscape leaves them especially vulnerable to profound physical, ecological, and associated societal disturbance from global climate change. Expected shifts in physical and ecological characteristics range from changes in flushing regime, freshwater inputs, and water chemistry to complete inundation and the concomitant loss of natural and human communities.

Therefore, managing coastal lagoons in the context of global climate change is critical. Badagry is a typical sand barrier-lagoon coastal community. The livelihood of these littoral people is dependent primarily on fish and agricultural activities which environmental phenomena are causing accelerated rates of erosion and flooding, and as a result have direct effects on the livelihood pattern. Sustainable management of sand barrier-lagoon demands a framework that is conscious of natural sand replenishment, beach stability and proactive adaptive and mitigation measures to checkmate climate change driven ocean surge threatening Lagos sand barrier - lagoon bioregion. This study investigates the alternative livelihood sources in degraded sand lagoon barrier landscape of badagry littoral communities.

A. CASE STUDY SETTING

Badagry is located at approximately latitude 70 15'N and 70 N and longitude 50 west and 70 west. It is located at the coastal plain and rarely is any part above three metres above mean sea level. It's also bounded in the north by the Egbado Plateau, in the south by the Atlantic Ocean and in the west by the Nigeria Benin border. In the east, it is hemmed in by the mangrove swamps west of Lagos. Badagry (57km from Lagos) is the westernmost part of all Nigeria major towns. It occupies a narrow stretch of land between the Badagry beach that has inlets into the sea at Cotonou and the Atlantic Ocean. Badagry community with a 1991 population census of 119,267 people is encumbered with challenges that other rural settlements along the 180 kilometres Lagos State Atlantic coastline endure. Pollution of lagoons, absence of fishing regulations in the various creeks and overexploitation of aquatic stocks by fish trawlers companies within the short 30 kilometres continental shelf. Unemployment and poverty enhanced the migration of the community's active labour force to metropolitan Lagos.

Figure 1: Map of Badagry showing important communities

The sandy nature of the local government makes drainage easy and this is what is responsible for its sparse vegetation. More than 75 percent of the local government is made up of loose sand and the rest of alluvial materials especially along river courses. Given its coastal location, there are many creeks and lagoons; the most important being Badagry creeks which enters into the sea at Apapa. The entire Badagry local government is underlaid by sedimentary rocks. Towards the ocean front is alluvial soil. There are marshy places in areas close to the lagoon and other places where river pass. Towards the eastern end, along lagoon front, are mangrove forests. Some few kilometers away from the lagoon front are grassland with few trees growing. There are forests along river courses. The soils are sandy and in some places loamy. Badagry division covers an area of about 71, 426 sq. km. In terms of administration, Badagry is divided into five major districts viz:

- ✓ Badagry Township
- ✓ Ajara communities
- ✓ Gbajin Aja Township
- ✓ Sea Beaches
- ✓ Ajido Area.

II. LITERATURE REVIEW

The lagoon barrier coastal areas are very important not only ecologically but also economically, physically and socially. These coastal areas provide a number of environmental benefits because of the dynamic nature of exchange and transfer of matter. This also includes energy and organisms either living or dead within the system. More so, driving forces that induce the functioning of the lagoon are dependent on the weather and climate changes; which impacts on the water level, the tidal waves and movement. The predominant impact has been on coastal communities with huge losses of life, livelihoods and properties (United Nation 2011). What then is livelihood?

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney, 1998:4). In addition to carney's definition, livelihood seems to offer a complete picture of the complexities of survival in low income economies/countries then the terms formerly considered adequate like 'subsistence', 'income', and 'employment'. Perhaps this increased awareness of livelihoods can lead to better formulated rural poverty reduction policies than those based conventionally on sectors and sub sectors. However, this conclusion should not be taken as axiomatic (Ellis, 1998)

The patterns of livelihoods might vary from place to place, from rural to urban area, from remote to core. There are five important forms of livelihood assets that determine the foundation of livelihoods. These are Natural capital, Social-Political capital, Human capital, Physical capital and Financial capital (IISD, 2003:13). All these assets largely determine the way the people, especially, the most vulnerable and poor, will respond to the impact of climate change and broaden their

scope to the adaptation process. According to IISD report on Livelihoods and Climate Change (2003), these changes of rainfall and temperature "will dramatically affect the livelihoods of many poor people, particularly through declining food security and problems with the viability of many livelihood activities, including livestock raising, fishing and the use of forest products as well as agricultural production"(IISD, 2003: 15).

Climate change will also minimize the opportunity of new livelihoods. The damage of physical capital such as infrastructure due to frequent natural disasters will limit the opportunity of eco-tourism, which could be work as a sustainable livelihood opportunity for the poor. IISD report claims that "the poor social and political capital, along with extremely limited access to financial capital, means that these communities are least likely to be protected by investments in infrastructure or disaster mitigation and relief systems" (IISD, 2003: 15); which is absolutely true in many cases. Besides, the worsening situation of water availability and quality in many developing countries like Nigeria will cause severe health risks to poor vulnerable communities. Water-borne (such as Diarrhea, cholera or Arsenic) and vector-borne (Malaria, Dengue etc.) diseases will increase the child's mortality rate in vulnerable areas, where health care facility is limited or difficult to reach. Badagry being the case study, therefore, this health hazard will pose another impact on livelihood if the key Productive person of a household is lost, or need to expense a lot of money for frequent times.

Studies have shown that solutions to the problems of poverty and resource degradation have tended to centre on the necessity to make small scale fisheries more economically efficient, while finding means to conserve fish stocks through a combination of management to limit access and incentives for current participants to leave the fishery. These policy prescriptions have typically been based on fisheries sector analyses that have not addressed the role of fisheries in the wider coastal economy. Starting from the premise that small scale fisheries are prone to uncertainty, realistic adaptation and diversification strategies must beat the core of alternative livelihoods and include responses at individual, household and community level. These can be characterized as flexibility within fisheries, geographical mobility and livelihood diversification.

Diversified livelihoods are also a feature of household strategies, with members of fishing households often being involved in different economic sectors to smooth the effects of resource variations. A variety of intra household responses can include the allocation of family labour in time of need, or acceptance of income fluctuation and modification of consumption patterns. The research explored alternative means of livelihood pattern in degraded badagry sand lagoon barrier landscape.

III. METHODOLOGY

This paper identifies the specific function of existing research mechanism and planning report as reliable secondary source of significant information. Desk top studies took into consideration the previous research works on sand barrier-lagoon complex bioregion, including coastal erosion in Nigeria (Ibe, 1988), marine ecosystem and Lagos State regional master plan (Ashinyanbi 2006). Relevant primary data was obtained through a combination of two participatory research techniques including structured interviews and personal observation, and mapping using GIS as a design tool. Participation was achieved through structured interview of community opinion to understand the historical background of the littoral community expectation. Personal observation took an inventory of existing livelihood pattern of the communities.

IV. RESULTS

Previous studies of this Sand Barrier –Lagoon Complex showed erosive characteristics due to four interrelated coastal processes (Ibe, 1988; Ashinyanbi 2006; Gold, 2008). First is the absence of Exoreic Rivers necessary for sedimentary deposit from upland sources. The second reason is the very active eastward long shore current. Thirdly the complex has a narrow continental shelf of about 30 kilometres wide. This shelf is indented by gullies and submarine canyons including Avon canyon on latitude 60 10'N and longitude 30 55'E (Ibe 1988). The narrow continental shelf empowers waves to reach the shore at higher heights and enhances the lost of near shore sediments to the gullies and canyon. Finally the intensity of wave action is high along the beaches due to the influence of the prevailing south westerly.

The waves affecting the Nigerian continental shelf are wind generated. Wave intensities on this coast are determined by the wind velocity, duration and fetch. Plunging waves are dominant in the Barrier-Lagoon coastline (Adejumo & et al 2011). Badagry which is an archetypal sand barrier-lagoon is under the influence of the rip and tidal current. Effects of rip current in the area are not very strong but a combination of high tide and ocean surge occasionally generates plumbs of sediments perpendicular to the shore line. The frequency of ocean surge and the accompanying destructive erosion and flooding, especially during the equinoxes, is high in the last thirty years.

The household survey carried out shows the existing occupation as a means of livelihood of the respondents were obtained from questionnaire. Figure 2 enumerates the existing occupation activities in the community. 30% farmers, 23% fishermen, 7% petty traders and 8% technicians/local artisans. The unemployed respondents were 16% while 10% were students. Others 6% did not respond to this question. The above scenario confirms that the study area is rural in nature.

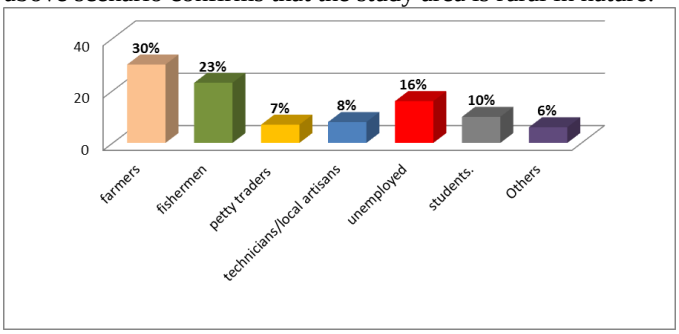

Figure 2: the existing occupation activities

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Structure interview were carried out in three different communities which include Badagry, Topo, and Ajido to sample their opinion on the change of livelihood patterns. They revealed that their means livelihood predominantly depends on the fish, shrimp farming and coconut plantation but presently there are other alternative means of livelihood which is dredging sand and aquaculture. Table 1 shows the changing livelihood patterns in three surveyed localities.

Name of Community	Number of Respondent	Previous Livelihood (before 2000)		Present Livelihood (2013)	
		Shrimp/fish Coconut Dependent	Sand mining/ Coconut Dependent	Shrimp/fish Coconut Dependent	Sand mining/ Coconut Dependent
Topo	7	6	1	2	5
Badagry	8	7	1	3	5
Ajido	5	3	0	1	3
Total	20	16	2	6	13

Source: Household Survey, 2013.

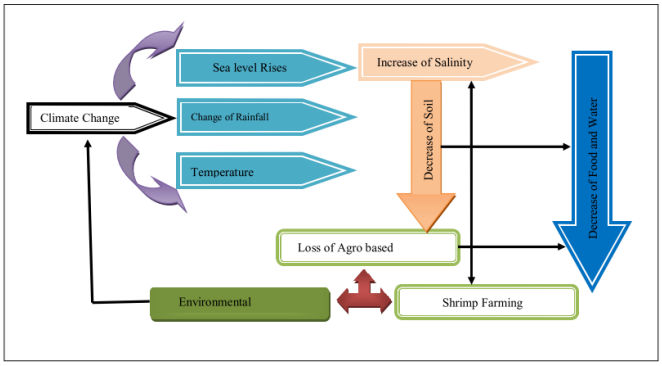
Table 1: The changing livelihood patterns in three surveyed localities

The inventory and analysis on current means of livelihood was lack of finance which was described as the backbone of any development. The people regretted that lack of finance is a great drawback to their development, as a result of their standard of living that is low and the rate of poverty is high and also the rate of unemployment pose a lot of threat to the community and this include rural-urban migration, robbery, youth delinquency, teenage pregnancy and other vices.

A. LIVELIHOOD LOSS AND ENVIRONMENTAL DEGRADATION

While conducting fieldwork in badagry, It has been observed that due to loss of traditional livelihoods, marginalized poor people who do not have the capacity to cope with new changes have engaged themselves in various non-eco- friendly activities, which further deteriorate environmental settings. Topo community have seen dredging of sand as a alternative means of livelihood by selling them to other parts of Lagos and neighbouring country instead of fish and shrimp farming and coconut plantation. These sand were collected from part of the island in Topo Island, though this operation is illegal and needs legal action against it. But the law enforcement authorities rarely think about it, rather it often allows this illegal activity continue which may cause some natural hazard in future. According to my key informant the Coast guard also does illegal sand business with the help of local influential people.

The major finding of this study is that the introduction of shrimp farming due to increasing Salinity level has deteriorated the environmental settings of Badagry. It has made Badagry more saline-prone zone than that it was before. This over-exploitation of environment caused serious socio-economic problems. Loss of livelihoods, decline of agricultural production, food and water insecurity, various health problems are among the most noticeable. Figure-3 shows us an overall impact of climate change and human induced activities on lives and livelihoods of Badagry. It shows how the changing climate order and brackish water shrimp farming degrading both the condition of livelihoods and environment in Badagry.



Source: Adapted from Muhammad Asiful Basar paper and modified by the Author.

Figure 3: Climate Change impact on Livelihoods in badagry

B. MITIGATION AND ADAPTATION STRATEGIES

Climate change poses an unprecedented challenge to eradicate hunger and poverty to meet the growing demand for food security and nutrition under increasingly difficult climate conditions and in a situation of increasingly difficult and diminishing resources. Strengthening resilience involves adapting practices that enable vulnerable people of badagry to protect existing livelihood systems, diversify their sources of income, sustainable livestock management practices and change of livelihood strategies.

Adaptation involves the steps that enable the vulnerable to protect existing livelihood systems which are possible through diversification of their sources of income, change in livelihood strategies and step for strengthening agriculture- base livelihood systems, research and dissemination of crop varieties and breeds adapted to changing climatic condition, effective use of genetically diverse population and species-rich ecosystems, promotion of agro-forestry integrated farming system and adapted forest management practices, tree crops for providing food, fodder and energy, improved soil management practices.

V. CONCLUSION

Climate change is perhaps the most serious environmental challenges humanity has ever faced. While the extent of climate change and its environmental and economic impacts are subject to debate, it is, nevertheless, clear that humans are altering the earth's climate in profound ways.

Subsequent to the overall discussion, the study presents four major findings: 1) the climate has been changing over the last thirty years in badagry community; 2) due to climate change, livelihood patterns of the coastal communities in badagry are also changing; 3) unplanned shrimp cultivation in brackish water and sand mining has caused severe environmental problems in Topo community and increased salinity levels over the last few decades, 4) the resources of these vulnerable communities for achieving sustainable livelihood are deficient, which further increase their vulnerability.

The above discussion presents that climate change is already taking place in different parts of Nigeria, especially in Lagos mangrove zone where marginalized communities are becoming more vulnerable of the society. It is also explored that these communities have very little knowledge on climate change and its future impacts. Most of them even do not know where they would move if their land ever submerge due to sea level rise.

Observing the situation and livelihood patterns of the community this study offered a lot of recommendations. By implementing of these approvals livelihood patterns of the may be developed. Major suggestions were as follows:

- ✓ The legal setback for developmental activities along Nigeria's coastline is fixed at 150 meters from the vegetation line. The setback implies that permanent structures should not be constructed within the specified range.
- ✓ A spatial consideration for recreational activities must be conscious of the coastal erosive potential occasioned by the short 30 kilometres continental shelf; eastward long wave current; high wave on the shore, the prevailing trade winds, absence of exoreic streams; and erratic climate change driven sea rise.
- ✓ The government should take some projects for economic and social development of the community.
- ✓ Health and reproductive health security including free treatment of different diseases and safety must be given priority. Bearing mind the experience of the recent Asian Tsunami, there must be a location of life guards and ocean surge early warning devices.
- ✓ The law enforcement authorities should enforce their laws on the illegal dredging of sand which may cause some natural hazard in future
- ✓ The government should conduct a survey to identify real conditions accurate number of badagry population because without knowing the real picture of population all programmes end in vain.

Finally, climate change adaptation and mitigation measures should go hand in hand. These measures need to be integrated into the overall development approaches and agenda. Adaptation to climate change should not be approached as a separate activity. Integration between adaptation and mitigation strategies should be carefully considered. Both should exhibit synergies.

REFERENCES

[1] Adejumo T. & Okedele N. (2011). Eco Sensitive Beach Design: Conceptualization of Community Recreational Sandy Beach Development. Change For Stability: Lifecycles of Cities and Regions. Eds: Manfred Schrenk, Vasily V. Popovich, Peter Zeile. Pp 201-204.

[2] Ashiyanbi, J. (2006) Review of the Lagos State Regional Plan (1980-2000). Regional Plan, Performance and Recommendation.

[3] Chambers, R & G.R. Conway (1991), Sustainable Rural Livelihoods: Practical Concepts for the 21st Century, Brighton: IDS, Discussion Paper 126.

[4] Carrada G. C, & Fresi E (1988). Le lagune salmastre costiere, Alcune riflessioni sui problem esui metodi. In carrada, cicogna, Fresi (eds), Coastal Lagoons: Research and Management, CLEM, Massa Lubrense (Napoli): 35-36.

[5] DFID, (1999). Guidance sheets at the Information resources, "Sustainable Livelihoods Guidance sheets, section 2: Methods of Implementing Sustainable Livelihoods Approaches" at: http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf IPCC report, 2007, Climate Change 2007: Synthesis Report, see: http://www.ipcc.ch/

[6] Ellis, Frank (1998), Rural Livelihoods and Diversity in Developing Countries, oxford, pp28-50

[7] Ghosh, P.K. and Ghosh, N.K. (2011). Livelihood Patterns of Bihari Community. Published by Lap Lambert Academic publishing GmbH &Co.KG, Saarbrucken, Germany.

[8] Ibe, D. C. (1988). Coastline Erosion in Nigeria. Published by the Nigerian Institute of Oceanography and Marine Research, Victoria Island. P.M.B. 12729. Lagos, Nigeria.

[9] Misra, S.R. (2012). Climate change and livelihood security some challenges and options in Climate change impact on lives and livelihood pattern, ed. Krishna Mandal. Pp 8-15

[10] Obioh, I.B. (2002). Climate Change: Causes, Analysis and Management. Paper presented at a climate change workshop, Abuja, April 2002.

[11] Ojo, A.O. (1999), The Physical environment of Lagos in Lagos State in Maps, (ed) by Yinka Balogun, Tayo Odumosu and Kayode Ojo Rex Charles & Connel Publications, Ibadan.