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EFFECTS OF COASTAL HAZARDS ON RESIDENTIAL LOCATION AND RELOCATION IN NIGERIA

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ABSTRACT: *Coastal hazards in Nigeria are becoming serious concerns for coastal residents. Apart from the loss of lives and properties, settlement relocation has been a consistent experience of communities around the coast. Multistage sampling method was used to select 870 respondents in the three hydrological division (Western liottoral, Niger Delta and Eastern Littora) of Nigeria. The study showed that coastal residents in response to coastal hazard occurrence relocate to a relatively safe site. The study recommends that costal communities should embark on construction of hazard resistant housing through community efforts.*

KEYWORDS: Coastal Hazards, Residential Location, Relocation in Nigeria

INTRODUCTION

Throughout human history, people have formed settlements along the coastline. Whether for food, livelihood, transport, recreation, or ambience, Human beings by default have always chose to live where sea or ocean meets the land. The coastal areas are recognized as zone subject to intensive human use such as: residential, port activities, fishing, shrimp culture, salt production and oil exploration (Islam, 2008). Coastal areas also comprise sites of export processing zones, airports, land ports, harbours andtourism. Moreover, being both a World Heritage Site and an ecological critical area such as mangrove ecosystem and coral ecosystem has grabbed the attention of environmentalists (Agrawala et al, 2003). Unfortunately, these areas are highly vulnerable to both natural and human-induced hazards like coastal flooding, cyclones, storms surges, salinity, erosion and pollution (Ministry of Water Resources, 2005). Increasing population growth, unemployment, low-income levels, and poor housing and sanitation conditions have increased the vulnerability of coastal communities.

Coastal towns are by far the most developed of Africa's urban areas and by implication, have a high concentration of residential, industrial, commercial, educational and military facilities (UN-Habitat, 2008). Urban residential development along the coast has, however, been indicated to be a large creator of risk for much of the urban population. Hazard (such as flooding) has been identified as one of the major factors that prevent Africa's growing population of coastal city dwellers from escaping poverty and stands in the way of achieving United Nations 2020 Millennium Development Goal of significant improvement in the lives of coastal urban dwellers (Action Aids 2006). This is because many coastal cities lack the infrastructure to withstand coastal hazards especially in Africa.

Many coastal communities have to move upland regularly to escape being washed away by encroaching sea. The beaches along the Nigerian coastline are very susceptible to flooding due to low topography of the coastline. Flooding in Victoria Island, Lagos state and other low-lying areas of the coastal states are common during rainy season (June – August) affecting residential areas. High rainfall in the Niger Delta coupled with poor drainage allows storm water to flood

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large areas within the Delta region. The speed, frequency and scale with which hazards occurred at coastal areas are growing (Baud et al, 2009). The financial and economic crisis, associated with climate change and current environmental crisis threaten human lives and security globally and the impacts are seriously felt at coastal regions. In Nigeria the vulnerability of the coastal areas is aggravated by climate change. Studies by the Inter-governmental Panel on Climate Change (IPCC) have shown that climate change related sea-level rise and other hydro-meteorological hazards could have catastrophic impacts on the coastal mangrove ecosystem (IPCC, 2001). Furthermore, all over the world, along with climate change, the frequency and intensity of hydro-meteorological disaster per year is increasing over time affecting coastal residential areas (UNDP, 2007). Disaster related records of Nigeria also prove this. For instance, the number of flood occurrence tripled over the last 50 years (National Emergency Management Agency, 2012). The devastating coastal erosion occurred on yearly basis and deteriorate large portion of coastal residential areas in Nigeria. Based on this premise, this study examines effects of coastal hazards on residential location and relocation.

Study Area

The Nigerian coastal zone sprawls a total of nine coastal States (out of the thirty-six States of the Federation) namely: Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Lagos, Ogun, Ondo and Rivers. The coastal States are estimated to account for 25% of the national population. The coastal areas stretch inland for a distance of approximately 15km in Lagos in the west to 150 km in the Niger Delta and 25 km east of the Niger Delta (Adati, 2012). The coastline stretches for 853km comprising inshore waters, coastal lagoons, estuaries and mangrove especially in the Niger Delta (Ibe 1984). The Nigerian coastal environment is divided into four main geomorphic zones, viz:(i) The Barrier Lagoon Coast which lies between Badagry and Ajumo east of Lekki town. (ii) The Mahin mud coast lying between Ajumo and Benin river estuary in the north western flank of the Niger Delta. (iii) The Niger Delta lying between Benin River in the West and Imo River in the east and (iv) The strand coastline lying between Imo River and the Nigerian/Cameroon border in the east with the Cross River inclusive (Awosika 2001).

The Nigerian coast and marine areas are under the influence of moderate oceanographic dynamics consisting of semi diurnal tides with tidal ranges varying from 1meter in the west to 3 meters in the east. The prevailing south-westerly waves vary from spilling to plunging waves. Long shore currents are prevalent in the near shore while the West East Guineas currents constitute the major ocean currents. The surface water of the Nigerian coast is basically warm with temperature generally greater than 24°C. The sea surface temperature show double peaked cycles which match quantitatively with the cycle of solar heights. Between October and May, sea surface temperature range from 27°C – 28°C while during the peak rainy season of June-September the range is between 24°C - 25°C. This decline has been attributed to an expression of the overall cooling of the South Atlantic and the Gulf of Guinea during this period of the year. The surface water is typical oceanic water of the Gulf of Guinea with salinity generally less than 35%. The coastal surface receives run-off water from land and from arrival precipitation. Salinity in the Niger Delta shelf range between 27 – 30% in January to March and 28-30% in June to September. The low salinity values are due to freshwater from the numerous estuaries of the Niger Delta (CEDA 1997). For the purpose of this study the three hydrological zones identified by Akintola (1986) shall be adopted as sampling frame. These zones are: the Western littoral, the Niger Delta and Eastern littoral which are discussed as follow:

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Western Littoral Hydrological Area

This includes the areas in the Barrier Lagoon complex, the mud coast and western delta flank. Some of the major rivers are Yewa, Ogun, Osun, Shasha, Oluwa, Siluko, Benin, Escavosand Forcados. Many of these rivers are long and originate with the Basement Complex except those in the western Delta flank.

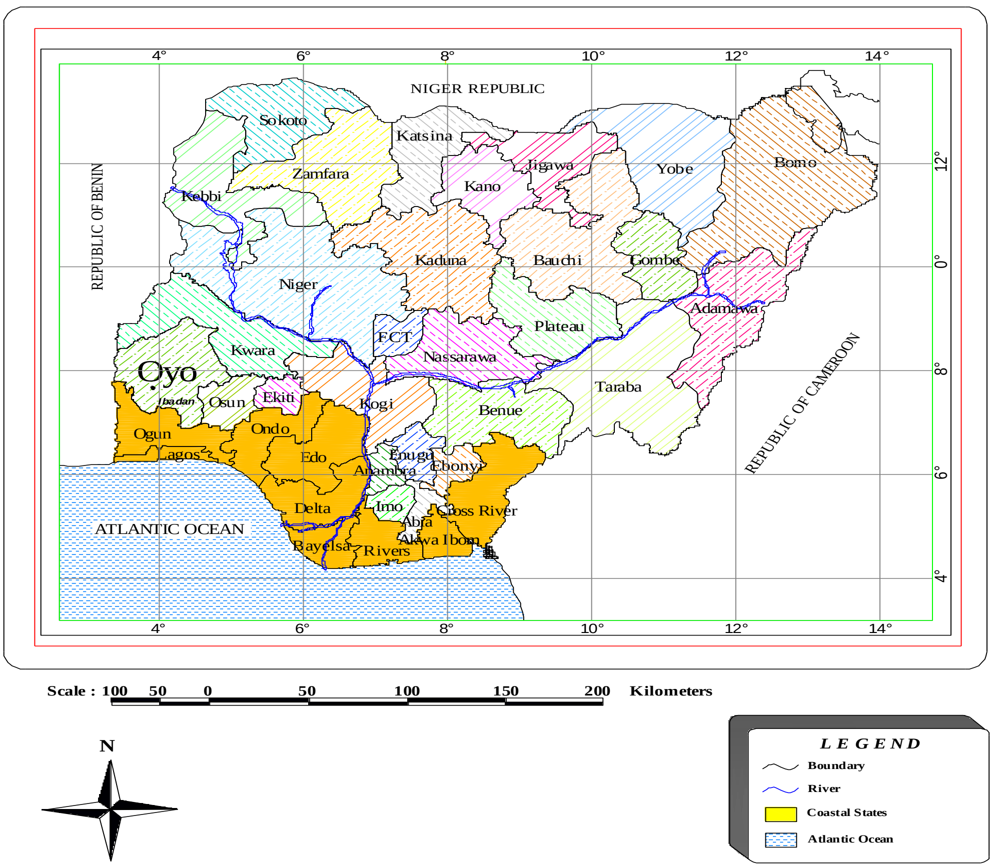
The Niger Delta Hydrological Area

This hydrological area comprises the rivers of Niger Delta. The zone consists of a diverse network of rivers and creeks. The major rivers include Ramos, Dodo, Pennington, Sengana, Nun, Brass, Santa Barbara and Sombrero. Most of these rivers are short coastal rivers and are tributaries to the Niger River. They originate within the coastal plain sands of the Benin Formation. The water is transparent and acidic. The Ase and Orashi rivers are located within this hydrological area and both run parallel to the Niger river.

Eastern Littoral Hydrological Area

This zone includes the rivers on the eastern Delta flank and the strand coast. These are: Bonny, Andoni, Imo, Kwa Iboe and Cross Rivers. The Imo and Cross Rivers are large river systems that originate from the Basement Complex.

FIG. 1: MAP OF NIGERIA SHOWING THE COASTAL STATES



SOURCE: Ministry of land Housing and Physical Planning Ibadan,Oyo State.2008.

METHODOLOGY

A multi-stage sampling strategy was adopted for the purpose of administering the questionnaire to respondents of the study area. At the first stage, the existing hydrological division of the Nigeria coastal areas were identified. These are: Western littoral, Niger Delta hydrological area and the Eastern littoral. At the second stage, all the States that fall within each of the hydrological divisions were identified as follow: Western Littora (Lagos, Ondo, Ogun and Edo); Niger Delta (Delta and Bayelsa) and Eastern littoral (Akwa Ibom, Cross River and Rivers). At the third stage, one State was randomly selected to reflect each of the hydrological zones. The randomly picked States were: Ondo, Delta and Akwa Ibom. At the fourth stage, all local government areas that fall within the coastal zone were identified and a local government area was selected at random to represent each of the selected States. The selected local governments were Ilaje, Warri South West, and Ibeno in Ondo, Delta and Akwa Ibom States respectively. The population of the selected local government areas was projected from 1991 to 2015. A sampling ratio was used to determine the sample size (Table 1). To sample from relatively large population of the study area, a sampling ratio of 1% was adopted which is in accordance with the assertion of Neuman (1991), that large population permits small sample ratios for equally good samples. According to him as the population size grows, the returns in accuracy for sample size shrinks

LITERATURE REVIEW

Natural Hazard

There are different definitions of hazard. Tobin and Montz (1997) argued that 'hazard is a broader concept that not only incorporates the probability of an event happening, but also includes the impact of the magnitude of the event on the society and the environment'. Blaikie (1994) states that hazard refers to 'extreme natural events which may affect different places singly or in combination at different times over a varying period'. Tobin (1997) states that hazard overlaps with disaster where hazard is an 'interaction between the human system and the events'. He further opines that hazard overlaps with disaster where hazard is the potential event and disaster is the result of the hazard. Blaikie et al, (1994) believe that there is a disaster when significant number of people had been affected by the hazard, be it to their livelihood, lives and properties that made them incapable of regaining or coping with losses'. According to Smith et al., (1998), the detailed way to define disaster is 'an event, concentrated in time and space, in which the community experiences severe danger and disruptions of its essential functions, accompanied by widespread human, material or environmental losses, which often exceeds the ability of the community to cope without external assistance.

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Table 1: Selected communities for questionnaire administration

Local Government Area	Community	Projected Population(2017)	Sample size
Ilaje	Ilowo Ayetoro	1,028	10
	Awoye	4,153	41
	Ilepete	19,121	191
	Oroto	5,022	50
	Araromi Seashore	4,486	44
Warri S/W	Ugborodo	14,363	143
	Ajudaibu	1,520	15
	Ogidigben	3,052	30
	Seashore	2,332	23
	OgbeIjoh	3,578	35
Ibeno	Atabrikang	1,986	19
	Okoro Utip	2,857	28
	Mkpanank	15,764	157
	Itak Abasi	2,215	22
	Idua Edor	3,968	39
	Total	**85,445**	**847**

Source: National Population Commission, 1991

Similarly, Bruce (2010) observes that people may choose to live in places exposed to natural hazards events because of the benefits they anticipate relative to the perceived risk. For example, people may choose to live and farm on floodplain because of its access to water and highly productive soils notwithstanding the likelihood of periodic flooding. In other areas people may live in exposed locations because they have limited alternatives. People live in squatter settlements that are exposed to hazard risks. It has long been established by Burton et al. (1968) that natural hazard events do not always result in disasters. An hazard event such as flood, turns into a disaster when people are unable to cope with the impacts of the events using their own resources and capabilities, and thus need outside help (Quaranttelli,1998). It is now well recognized that disaster risk is not just a function of the physical characteristics of natural hazard events (for example: magnitude, recurrence and interval), but the product of such events and vulnerable population and their ability to take steps to anticipate and cope with the event (Haque et al., 2007). Despite this scholarly understanding, and extensive international efforts to reduce disaster risk and build resilience, the global impact of natural hazard continues to escalate; vulnerable poor and marginalized communities are hardly hit. Bruce (2010) opines that increasing numbers of people are exposed to natural hazards because of exponential population growth; human modification of natural systems that reduces inherent protective function, development intensification and concentration of people in mega cities and urban areas, many of which are prone to hazard events; and the underlying causes and drivers of living in harm’s way. To compound matters, climate change is likely to exacerbate disaster risk although there are important regional differences in exposure and vulnerability (Van Aalst, 2006). Consequently, there is growing worldwide concern about natural hazards and increasing attention is being focused on ways to reduce risk of disaster (UN, 2004).

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Modes of Hazard

Hazards are sometimes classified into three modes; Dormant, Armed, Active. Dormant hazard has the potential to be hazardous, but no people, property, or environment is currently affected by this hazard. For instance, a hillside, may be unstable, with the potential for a landslide, but there is nothing below or on the hillside that could be affected. Armed hazard – People, property, or environment are in potential harm's way. Active hazard is a harmful incident involving the hazard that has actually occurred. Often this is referred to as accident, emergency and incident (Wikipedia Encyclopedia, 2008).

Coastal zones and communities

Although there is a long history of human settlement in coastal zones, until 20th century, the level of disturbance to natural processes did not appear to be critical. During the 20th century, coastal populations grew rapidly around the globe because of many economic opportunities and environmental amenities that coastal zones provide (Turner et al, 1996). Low-lying areas near coasts now have the largest concentrations of people on earth (Small et al., 1999). The population in the "near-coastal zone" (defined as areas both within 100 meters elevation and 100 kilometers distance off the coast) in 1990 was estimated at 1.2 billion (23%) of the world's population (Nicholls et al., 1999). Nicholls et al., (op cit) also shows that most of the near-coastal zones are sparsely inhabited, with the human population being concentrated in a few specific areas of the world's coast. There are wide variations in coastal population. In many small island nations, all land suitable for human habitation is in coast. Similarly, in some large countries, most of the major urban centers are located near the coast as in Australia. The United Nations medium projection for population growth suggests that the world's population would reach 7.2 billion by the year 2015, 7.9 billion by 2025 and 9.3 billion by 2050 (UN/DESA, 2001). Growth rates in individual countries will be largely determined by the country's current demographic patterns and fertility rate. Age structures in most developed countries are such that during the coming decade's greater number of people will come into their prime reproductive years than in industrialized countries. Furthermore, fertility rates are generally higher in developing countries. As a result, all projected population growth until 2050 is expected to occur in developing world (UN/DESA, 2001). Most of the population in developing countries will occur in urban settings and much of this will be concentrated in coastal zones, as in most industrialized countries. It was projected that by 2015 there would be 33 cities with a population of more than 8 million along the coast (UN/DESA, 2001). The large population in many coastal areas around the world are, to a greater or lesser extent, vulnerable to hazardous events associated with natural coastal dynamic such as storm surges, floods and tsunamis. Human-induced climate change and sea level rise will further increase this vulnerability to hazards.

DISCUSSION OF FINDINGS

Residential relocation is an important attribute of the coastal dwellers of Nigeria due to various hazards that occur in the region. Often residents relocate to safer area whenever there is need to do that. Occurrence of hazards on daily basis had informed the coastal dwellers of Nigeria to either relocate or change residence to a safer location. A cursory look at Table 2 shows that 55.81% of the coastal respondents have changed their residence due to occurrence of coastal hazard. The residents that changed their residences are those who located very close to the

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coastline, whose residence has been claimed by the ocean while the respondents that have not changed their residence were those who sited their buildings far away from the coastline and were less affected by the coastal hazards. Almost half of the sampled population (47.72%) have migrated out of their communities to escape adverse effects of hazards most especially when these hazard were at their peak of occurrences. Respondents (44.1%) that have not migrated out of their communities were those whose economic activities are tied to the community and have learnt to cope with various degree of hazards that occurred at the coastal area of Nigeria. In response to occurrence of coastal hazards large percentage of residents (36.5%) in Ondo state changed their residences while many respondents (39.7) migrated out of their communities in Akwa Ibom State.

Reasons why sampled respondents of the study area either changed their residences within the community or migrated out of it were given as: hazard occurrence, economic situation, feel like and others. From these reasons, hazard occurrence accounted for the largest percentage (79.52%). When their former residence (Plate 1) was attacked by coastal hazard such as flood, erosion, ocean surge and others, they have no option than to move to another location that is relatively safe. Economic situation forced 20.15% sampled respondents to change their residence while 0.26% respondents feel like changing their residence. The major reason that was responsible for migration of 64.48% respondents was hazard occurrence. Migration of the sampled respondents was seasonal. They migrated out of their communities located at the coast to hinterland to escape coastal hazards. Respondents that tied their migration to economic situation were only 20.28%. These set of people moved out of the coastal communities to engage in other businesses that were not coastal oriented. Some of the population (9.9%) migrated out of their community because they feel like migrating. This set of people moved out of their community to fulfill their desire of experiencing a change of environment. Other reasons that motivated 5.3% respondents include visiting loved ones and family members who resided outside the community.

Plate 1: Raised building foundation in Araromi seaside, Ilaje, Ondo state, Nigeria.

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Coastal Residents' Relocation Characteristics in Nigeria

Migration as a demographic process is associated with coastal hazards in several ways. On one hand, proximate coastal environmental hazards might influence residential decision-making by shaping the desirability of particular location. In this case, one might consider coastal hazards as factor shaping coastal dwellers' migration. On the other hand, migration can represent an exacerbating force with regard to coastal hazards as a result of increasing population density in vulnerable coastal areas. Duration of emigration of sample coastal dwellers vary. Large percentage of the respondents (65.95%) migrated out of the environment for less than a month. The migration of this set of people occurred when the dreadful hazards reach their peak of occurrence. For a period of 3 to 4 months 13.21% migrated out of the study area in a year while 8.39% migrated for 1 to 2 months. The number of respondents that migrated out of the coastal communities for more than 7 months accounted for 6.1%. The implication of this is that the coastal residents migrated for a very short period of time to escape the adverse effects of hazards when they were at the peak of occurrence. Migration is a coping strategy that large number of coastal dwellers adopted in response to coastal hazards.

Table 2: Residents' Relocation Characteristics in Coastal Communities in Nigeria

State	Community	Change Resident		Migrate	
		Yes	No	Yes	No
	Awoye Freq	25	12	15	26
	%	6.8	4.2	4.1	6.5
	Ilepete Freq	42	59	38	86
	%	11.5	20.4	10.4	21.4
	Oroto Freq	22	21	20	24
Ondo	%	6.0	7.3	5.4	6.0
	Ilowo Freq	5	4	4	6
	Ayetoro %	1.4	1.4	1.1	1.5
	Araromi Freq	13	18	17	12
	Seashore %	6.0	6.2	4.6	3.0
	Sub Total Freq	107	114	94	154
	%	31.7	39.5	25.6	38.4
	UgborodoFreq	81	47	69	78
	%	22.2	16.3	18.8	19.4
Delta	AjudiabuFreq	7	3	11	5
	%	1.95	1.0	3.05	1.2
	OgidigbenFreq	16	14	16	15
	%	4.4	4.8	4.4	3.7
	Seashore Freq	17	2	8	13
	%	4.7	0.7	2.2	3.2
	OgbeIjohFreq	12	24	23	13
	%	3.3	8.3	6.3	3.2
	Sub Total Freq	133	90	127	124
	%	36.5	31.1	34.7	30.7
	MkpanankFreq	67	56	78	60
	%	18.4	19.4	21.3	14.9
	IduaEdorFreq	5	2	18	12
	%	1.4	0.7	4.9	3.0

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Akwa Ibom	AtabrikangFreq	22	18	17	25
	%	6.0	6.2	4.6	6.2
	ItakAbasiFreq	12	6	13	9
	%	3.3	2.1	3.5	2.2
	OkoroFreq	19	16	20	18
	Utip %	5.2	5.5	5.4	4.5
	Sub Total Freq	125	98	146	124
	%	34.3	33.9	39.7	30.7
Total	**Freq**	**365**	**289**	**367**	**402**
	%	**100.00**	**100.00**	**100.00**	**100.00**

Source: Authors' field survey, 2015.

Perception of Age Group Mostly Vulnerable to Coastal Hazards

There is variation in the effect of coastal hazards on different age groups. According to table 2 below 32% of the sampled respondents were of the opinion that 60 years and above age group were seriously affected by the coastal hazards such as flood, ocean surge, erosion, air pollution and oil pollution. Active age groups between 21 – 50 years were less vulnerable to coastalhazards that occurred in the study area. Children (less than 10 years) and teenagers (10 -20) years were also affected by the coastal hazards. These two age groups were vulnerable because they lack adequate coping mechanisms with coastal hazards. The age group 51-60 years were the most vulnerable as perceived by 40.2% respondents in Ondo state while in Delta state 45.9% respondents believed that age group 51 - 60 years were the most vulnerable. The case is different in Akwa Ibom where 46.5% respondents perceived age group 11 – 20 years to be the most vulnerable group to coastal hazards.

Table 3: Perception of Age Group Mostly Vulnerable to Coastal Hazards in Nigeria

State	Community	< 10 yrs	11 – 20yrs	21 – 30 yrs	31 – 40 yrs	41 – 50 yrs	51 – 60 yrs	Above 60 yrs	Total
	Awoye	1	5	2	5	3	4	21	41
		1.60	3.10	4.30	16.70	4.50	2.80	8.10	5.30
	Ilepete	12	16	8	4	14	30	40	124
		18.80	10.10	17.40	13.30	21.20	20.70	15.40	16.10
Ondo	Oroto	1	6	3	1	5	21	7	44
		1.60	3.80	6.50	3.30	7.60	14.50	2.70	5.70
	ilowoayetoro	0	2	1	1	3	2	1	10
		0.10	1.30	2.20	3.30	4.50	1.40	0.40	1.30
	araromi	1	8	0	1	0	4	15	29
	seashore	1.6	5.0	0	3.3	0	2.8	5.8	3.8
	Sub total	15	37	14	12	25	61	84	248
		23.6	23.3	30.4	39.9	37.8	40.2	32.41	32.2
Delta	Ugborodo	24	33	10	4	14	21	41	147
		37.5	20.8	21.7	13.3	21.2	14.5	15.8	19.1
	Ogidigbe	0	3	0	0	1	9	8	31
		0	1.9	0	0	1.5	6.2	3.1	4.0
	Seashore	0	2	1	1	3	4	10	21
		0	1.3	2.2	3.3	4.5	2.8	3.9	2.7
	OgbehIjoh	0	4	1	3	1	6	21	36

		0%	2.5	2.2	10.0	1.5	4.1	8.1	4.7
	Sub total	0		0	0	0	3	10	16
		0	1.9	0	0	0	2.1	3.9	2.1
	Mpanank	5	51	7	3	8	25	39	138
		7.8	32.1	15.2	10.0	1.5	4.1	8.1	4.7
	IduaEdir	0	2	2	2	6	6	12	30
Akwa Ibom		0	1.3	4.3	6.7	9.1	4.1	4.6	3.9
	Atabrikang	9	4	3	3	3	3	17	42
		14.1	2.5	6.5	10.0	4.5	2.1	6.6	5.5
		0	5	0	0	3	2	12	22
	ItakAbasi Okoroutip	0	3.1	0	0	4.5	1.4	4.6	2.9
		7	12	5	2	2	5	5	38
		10.9	7.5	10.9	6.7	3.0	3.4	1.9	4.9
	Sub total	21	74	17	10	22	41	85	270
		32.8	46.5	36.9	33.4	33.2	28.2	32.8	35.1
	Sub total	24	45	12	8	19	43	90	251
Delta		37.5	28.4	45.9	26.6	28.7	29.7	34.8	32.6
	Total	**64**	**159**	**46**	**30**	**66**	**145**	**259**	**769**
		8.32	**20.67**	**5.92**	**3.9**	**8.58**	**18.85**	**33.67**	**100**

Source: Authors' field survey, 2015.

Community Assets Affected by Coastal Hazards

Large concentrations of assets and infrastructure in coastal region of Nigeria contributed substantially to higher direct losses from coastal hazards. Flood, erosion, ocean surge, oil pollution, salinity, air pollution and other periodically revisit the same geographical zones. The increased concentration of assets and infrastructure in coastal area will lead to more damage caused by coastal hazards. According to United Nations (1997), a growing number of extremely large cities are located in hazardous areas, which means that large amount of infrastructures may be affected. Community assets and infrastructure were adversely affected by series of coastal hazards. Critical public infrastructure affected by coastal hazards include: market, road, school, worship centre, electricity and others. The same proportion of respondents sampled (70.46%) conceded that market and school were public infrastructures highly exposed to coastal hazards. Primary school buildings in Ugborodo, Ayetoro and Awoye were flooded with water at the time when this study was conducted. Market in Ugborodo was razed by fire as a result of Ijaw and Itsekiri clash in January 2014. Roads in the study area were in terrible state as a result of effect of coastal hazards. Roads in the community were flooded with water everytime it rains heavily.The footpaths were muddy and slippery. In Ilepete, Ugborodo, Utabrika for examples there were no motorable roads within the community. The above explanation was supported by 70% respondents sampled in the study area. It was the view of 68.12% sampled respondents in the study area that worship centres were the most vulnerable to coastal hazards. At Edemefa, the community's church was in the state of deterioration resulting from impact of coastal hazards.

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Table 3: Community Assets Exposed to Coastal Hazards in Nigeria

State	Community	Market		Road		School		Worship centre		Electricity	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	Awoye Freq	24	4	34	5	38	1	36	1	36	0
	%	4.4	3.1	6.3	2.8	7.0	5	6.9	5	7.7	0
	Ilepete Freq	89	15	92	21	88	25	91	23	79	24
	%	16.4	11.6	17.1	11.7	16.2	12.3	17.4	10.7	17	11.3
	Oroto Freq	32	11	25	19	29	15	30	14	21	23
Ondo	%	5.9	8.5	4.6	10.6	5.4	7.4	5.7	6.5	4.5	10.8
	Ilowo Freq	8	0	10	0	6	2	6	2	6	2
	Ayetoro %	1.5	0	1.9	0	1.1	1.0	1.1	9	1.3	9
	Araromi Freq	14	9	17	9	20	9	24	5	21	5
	Seashore %	2.6	7.0	3.2	5.0	3.7	4.4	4.6	2.3	4.5	2.4
	Sub Total Freq	167	39	178	54	181	52	187	45	163	54
	%	29.8	23.2	33.1	30.1	33.4	30	35.7	33.5	35	33.5
	Ugbodo Freq	107	30	86	51	94	47	82	52	84	45
	%	19.7	23.39	16	28.3	7.3	23.2	15.6	24.3	18.1	21.2
Delta	Ajudiabu Freq	10	6	9	7	11	5	13	3	13	3
	%	1.8	4.7	1.7	3.9	2.0	2.5	2.5	1.4	2.8	1.4
	Ogidigben Freq	21	7	20	10	21	9	24	7	17	13
	%	3.9	5.4	3.7	5.6	3.9	4.4	4.6	3.3	3.7	6.1
	Seashore Freq	19	2	16	5	16	5	15	6	10	11
	%	3.5	1.6	3.0	2.8	3.0	2.5	2.9	2.8	2.2	5.2
	OgbeIjoh Freq	26	10	21	15	21	15	27	9	20	`16
	%	4.8	7.8	3.9	8.3	3.9	7.4	5.2	4.2	4.3	17.5
	Sub Total Freq	183	55	152	88	163	81	161	77	144	72
	%	33.7	42.8	28.3	48.9	20.1	40	30.8	36	31.1	51
	Mkpanank Freq	95	25	98	29	98	40	100	38	89	32
	%	17.5	19.4	18.2	16.1	18.1	19.7	19.1	17.8	19.1	15.1
	IduaEdor Freq	13	10	18	9	23	7	27	8	25	2
	%	2.4	7.8	3.3	5.0	4.2	3.4	5.2	4.2	5.4	9
Akwa	Atabrikang Freq	41	0	42	0	28	14	7	35	13	20
Ibom	%	7.6	0	7.8	0	5.2	6.9	1.3	16.4	2.8	9.4
	ItakAbasi Freq	13	0	16	0	22	0	22	0	16	0
	%	2.4	0	3.0	0	4.1	0	4.2	0%	3.4	0
	Okoro Freq	30	0	35	0	27	9	20	16	15	16
	Utip %	5.5	0	6.5	0	5.0	4.4	3.8	7.5	3.2	7.5
	Sub Total Freq	192	35	209	38	19	70	176	97	158	70
	%	35.4	37.2	38.8	21.2	36.6	34	33.6	46	33.9	41
Total	**Freq**	**542**	**129**	**539**	**180**	**542**	**203**	**524**	**219**	**465**	**196**
	%	**100 %**	**100 %**	**100**	**100**	**90.1**	**100**	**100**	**100**	**100**	**100**

Source: Authors' field survey, 2015

CONCLUSION

Coastal hazard has continued to gain research attention in the recent time due to the saddening experience of residents in coastal regions in Nigeria. Thus, in minimizing the effects of coastal hazards in Nigeria and beyond, the following suggestions are thus put forward; The coastal

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States and coastal local government areas should do all they can to make available large numbers of housing plots located on safer sites for all income groups through effective implementation of Town Planning Standards; the coastal local government areas should gradually convert all existing hazard-prone areas into conservation areas; construction of hazard resistant houses (houses constructed with metal and aluminium) in strategic communities at the coastal areas.

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