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Community Participation Approach to Flood Disaster Management: The Case of Enugu East Local Government Area of Enugu State, Nigeria.

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ABSTRACT : *Enugu East Local government Area of Enugu State is one of the three local government Areas that make up the Enugu Urban. Many rivers, rivulets and streams crisscross the area and they do overflow their banks during rainy seasons. This phenomenon has on several occasions brought havoc to the inhabitants of the area as the overflows find their ways into homesteads. The aim of this paper is to showcase a study carried out to assess the situation with a view to coming up with ways of coping with the challenges there from. Survey research was adopted whereby the prone areas were carefully selected and studied in relation to vulnerability, causes, effects and possible measures. It was discovered that human activities in form of physical development actions contribute significantly to the problems of flood disaster in the area. The case was more prevalent at Umuchigbo area where the banks of Ava River and other seasonal streams have been distorted appreciably by construction of residential, commercial and other buildings. Waterways of some seasonal streams have been built up completely. A number of measures are advanced to curb the menace, chief of which is galvanizing the citizenry in adopting long term resilience as affordable through biotechnological approaches.*

KEY WORDS: *Prone areas, physical development, flood disaster, biotechnological approaches.*

I. INTRODUCTION

Flood disaster is a familiar problem in the world today. It has attracted the interests of professionals in various fields who are interested in studies in respect of the causes, effects and remedies. Flooding is a dangerous phenomenon in that it has the potential to dislodge inhabitants of an appreciable area. According to ACE Geography (2014), in Australia, floods are the most expensive type of natural disaster with direct costs estimated over a period 1967-2005 averaging $377 million per year. In the United States of America, flood losses averaged $2.4 billion per year for the last decade and floods are the one natural disaster in the area. Also, there was a large earthquake off the southeast coast of Peninsula, Japan which caused a specific-wide tsunami in 1944 (National Oceanic and Atmospheric Administration (NOAA), 2014).

Nigeria in 2012 witnessed flood disaster that surpassed all that happened in the past. According to Enugu State (2014), the floods began in early July and claimed about 363 lives, while displacing over 2,100,000 people as of November. During the period, many Nigerian coastal and inland cities experienced heavy rains. Lagos witnessed great floods that affected the residents adversely. In Ibadan, in mid-July, 2012, flooding caused some residents at Oke-Ayo and Eleyele to flee their residences. In late July, 2012, at least 39 people were killed due to flooding in Plateau state as heavy rainfall caused Lamingo Dam to overflow to flood several neighbourhoods (Enugu State, 2014). Similar stories abound in many other places in Nigeria over the years. Apart from the disaster caused to the human elements, there are other numerous effects of flooding on the environment. Anikwe (2014), stressed on decrease of soil productivity due to salinization and acidification. According to him, the fall of Mesopotanian civilization (one of the early centres of urban civilization in the era of modern Iraq and Eastern Syria between Tigris and Euphrates rivers) was not only because of wars but also because of salinization of the rich aluvial soils in the coasts of the rivers used for irrigation with saline river water. The salinization leads to decreased soil productivity and its consequences. Also, during floods, roads, farms and bridges are destroyed.In Enugu State, even though the area lies in much of the Udi plateaux, some sections lie in rolling lowlands occasioned by some rivers. Enugu East Local Government Area is one of such areas whose certain sections lie in these lowland areas. Many rivers, rivulets and streams crisscross the area and they do overflow their banks during rainy seasons. This phenomenon has on several occasions brought havoc to the inhabitants of the area as the overflows find their way into homesteads. The aim of this paper, therefore was to showcase a study carried out to assess the situation with a view to coming up with ways of coping with the challenges there from. The more specific objectives include:

[1] Finding out the areas devastated by flood in the study area.
[2] Identifying the possible causes of the floods.

[3] Finding out the potentials for community participation in the management of flood disaster in the area.
[4] Making recommendations in respect of ways to curb the disaster.

II. METHODOLOGY

Survey research design was adopted in the study and then a descriptive analysis of observed activities in the area. Prone areas in the six large communities that make up the area were carefully selected and studied in relation to vulnerability, causes, effects and possible measures. The selected areas include iji-Nike, Umuchigbo, Edem, Ibagwa and Emene communities. The water bodies that are found in these areas include Ava River, Ululo stream and Nike Lake.

Conceptual Framework and Review of Related Literature : The concepts of such issues as flood/flood disaster and community participation are briefly addressed alongside related literature.

Flood and Flooding : Flood is a natural event where a piece of land (area) that is usually dry land, suddenly gets submerged under water (ACE Geography, 2014). Some floods occur suddenly and recede quickly while others take days or months. When floods occur in an inhabited area, they carry along houses, bridges, cars, furniture and even people. It can also wipe away farms and many heavy items. About three types of floods can occur. They include flash floods, rapid on-set floods and slow on-set floods. Flash floods occur within a very short time (2-6 hours) usually due to heavy rain, dam break or snow melt. Rapid on-set floods take slightly longer periods to develop and can last for one or two days. Slow on-set flood often result when water bodies over flood their banks. They develop rather slowly and can last for days and weeks. Naturally, water flows from higher to lower level areas – ACE Geography (2014), outlined natural and physical causes of flood. Flooding occurs when a river's discharge exceeds the capacity of its channel to carry the discharge. When there is excessive precipitation occurring over a long period of time, it leads to saturation of the soil. In this case, when the water table reaches the ground surface, there is increased overland flow or runoff. If the ground surface is baked hard after a long period, the precipitation may be over a short period but cannot be absorbed quickly enough. In this case, more water reaches the recipient river than would have been the case.

Flood can wear away land surface since it is moving water with much force. Okpala-Okaka (2010), defines erosion by water as battering, pulverizing, scraping, scratching, grinding and transportation of detached soil particles by flood. According to him, flood is a major agent of soil erosion and with a resultant depletion of soil nutrients and poor harvest.Other causes include melting of snow and climatic hazards. In the melting of snow, when the subsoil is still frozen, infiltration capacity is reduced. Climatic hazards such as cyclones, hurricanes and deep low pressure weather systems bring abnormally large amounts of precipitation. Also, global warning has been blamed for increased frequency of flooding. It could lead to the melting of the polar ice caps, thereby leading to a rise in sea level. In this case, flood plains lying close to the sea levels would be at risk from flooding. The nature of drainage basin has influence on flooding. Some drainage basins are prone to flooding more than others. The relief, vegetation, soil type and the general geology often influence the nature of flooding in an area. Human activities have also influenced the amount of flooding over the years (ACE Geography, 2014). Urbanization is paramount in this respect. The concentration of people and activities in towns and cities has led to crass demand for land. Land has therefore, become scarce and has led to people building on flood plains. Several development actions have brought about paving a considerable portion of the urban land. Precipitations which cannot infiltrate these impervious sections of the environment find their way into the rivers and other waterways quite easily. Deforestation also decreases the ability of vegetation to intercept runoff.

III. EFFECTS OF FLOODING

Floods have devastating effects on the people, the environment and on the general economy. Many people die due to flash floods. For example, Colorado in USA, in 2013 witnessed severe splash flood in early September of that year. In that incidence, within four days about 8 people died, roads were washed away, 1,000 homes were destroyed and about 200 businesses were destroyed (eSchooltoday, 2014).On 9th September, 2013, heavy rainfall that occurred over a spread of 4 hours resulted in flash floods that struck about 5 local government areas in Plateau State (Davis, 2013). As many as 300 houses were reportedly destroyed alongside many livestock and crops. The same story was told of Kebbi, Cross-River and Lagos States. Environment has also suffered the catastrophe of floods. The National Oceanic and Atmospheric Administration (NOAA, 2014) reported that in 2011, the huge tsunami that hit Japan and which led to flooding of part of the coastline caused massive leakage in nuclear plants. This caused high radiation in the area. Apart from this type of incidence, floods wash chemicals and other hazardous substances into recipient water bodies. This has often led to lots of diseases and infections.

Flood Prevention.: A good number of measures have been advanced towards preventing floods and their associated problems. Okpala-Okaka (2010), suggested such measures as digging of deep wells within the compound walls, digging of deep wells along the roads and digging of ditches outside the compound walls. These wells and ditches are to be dredged during dry seasons or as often as necessary. While Okpala-Okaka's measures are germane to homesteads, other measures must be taken to tackle the more intense floods from rivers and other flood plains. This may have led to the idea of sea/coastal defence walls (see Figure 2.1).

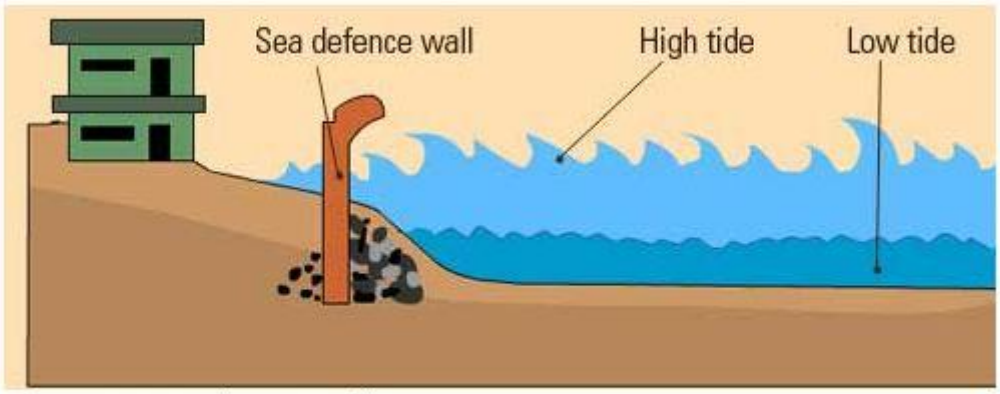

Figure 2.1: Defence Walls
Source: eSchootoday, 2014.

Sea/coastal defence walls and tide gates are built to prevent tidal waves from pushing the waters up shore.
Retaining walls, levees (artificial embankment alongside a river), lakes, reservoirs (retention ponds) are constructed to hold extra water during times of flooding. Trees, shrubs and grass also help to protect the land from erosion by flood (Okpala-Okaka, 2010). In this case, people living in prone areas are often encouraged to employ vegetation to help break the power of the flood so as to reduce the devastating effects. Development control mechanisms have been advanced as measures to forestall flood menace. In this case, development permits are not issued in respect of development along floodable areas of rivers or other water bodies. (See Figure 2.2).

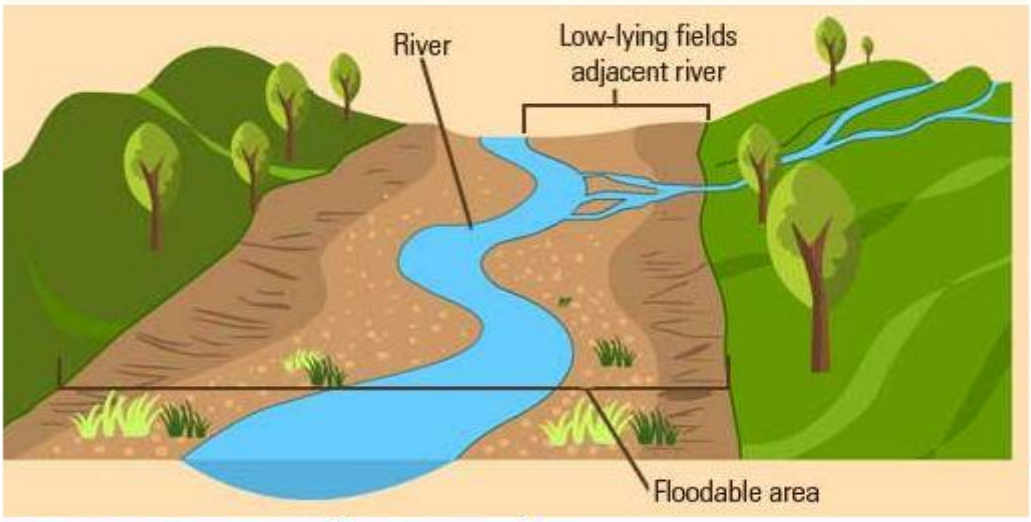

Figure 2.2: Features of a water Body.
Source: eSchooltoday, 2014.

This mechanism (development control) also ensures that drainage systems are not covered with objects or activities that would chock them. Another dimension of flood prevention is education. According to eSchooltoday (2014), in many developing countries, drainage systems are choked with litter simply because people are ignorant of their effects during rains. During rains,

waterways and culverts that have been blocked by huge junks of litter and debris result in floods finding their ways into streets and homesteads, as is the case in the study area.Detention basins are small reservoirs that are built and connected to waterways to provide temporary storage for flood waters. They reduce the tempo of downstream flooding. In cases of slow on-set floods, people are given more time to take precautionary measures since flood water drain into the basins first before eventual discharge into the waterway. Apart from the measures so far discussed, there are other flood control mechanisms that have resulted from advanced technology. These mechanisms have been developed, used in advanced countries and have been proven effective. One is called No Flood Barriers PRO/BASIC. They are a range of flood control barriers that deliver a highly efficient and cost effective flood protection. They are designed, manufactured, supplied and installed by Environment Solutions ApS, a company based in Denmark (TelmontMontenegro.com, 2014). The Global Flood Defense Systems (Global Floods, 2014) have also been used and confirmed effective in UK, Europe, USA, Mexico and Malaysia. They are passive flood barrier systems for community and infrastructure defenses against floods. Okpala-Okaka (2010), suggests community efforts in fighting flood. He suggested community sub-committees that comprise professionals such as scientists and other people who are knowledgeable in land use and erosion control.

Community Participation : Doherty (2008) defines community participation as members of a community being involved in the actions and decisions which affect their lives and the life of their community. A community, according to him can be those living in one area, or who have some extremely important life experience in common. Examples include travelers, immigrants, people with disability and other groups. Essaghah, Omatsone and Uwadiegwu (1998), used the word "citizen participation" and discussed it along the line of physical planning. According to them, it is about citizens' consultation, involvement and sharing in the power and responsibilities inherent in the planning and control of Land use. Community or citizen participation, therefore, is an involvement of all stakeholders in the totality of society activities. It is an approach that best embraces the recent calls for bottom-up approach to matters pertaining to handling our environmental issues. In Doherty's (2008) opinion, some people have community participation as their main aim while others exist simply to provide services. To this he gave reasons why community participation is important to the later as follows:

[1] People should play a part in making the decisions which affect them and for any organization that accepts this principle, increased participation is an end in itself.

[2] Powerlessness is commonly seen as a feature of poverty and social exclusion, groups that are desirous of tackling such problems should be concerned with encouraging participation, where those who have been traditionally excluded from decision making are made to gain more power.

[3] If an organization affiliates to a community participation network, such is making a commitment to the development of the local community, which often includes the development of local people's ability to decide and act for themselves.

[4] For an organization that is trying to provide servises, it should be sensible to note that the more the end-users of services are involved in the planning, evaluation and delivery of such services, the better those services will be at meeting their needs; since the best judge of what an individual needs and whether or not they are being met is usually by the individual.

[5] No single community consists of a single group of people who think the same way and have the same needs and interests, but when many members are involved in any process, there is a greater chance that all of the different views and experiences of the community will be represented.

[6] The more people are involved deeply in any initiative, the more likely the initiative is to get community support, and therefore, the more likely it is to be successful.

Summary of the Review : This review has showcased flooding and its effects as natural event that cannot be stopped out rightly of humans since one can neither stop the rains from falling, stop flowing waters from bursting their banks nor stop physical developments or urbanization. What can be done is to take preventive measures to mitigate the impacts on people, the environment and the economy. At the community level and on a small scale and affordable measure, the building of ditches, deep wells and detentions basins as proposed by Okpara-Okaka (2010) and eSchooltoday (2014). At a more sophisticated level and for big water bodies like by rivers and seas, the several flood defence systems may be employed as suggested by TelmontMontenegro (2014). In all of the cases, the community participation agenda is important. According to Okpala-Okaka (2010), in his study carried out in Ora-Eri Community of Anambra State of Nigeria, there existed a standing committee for controlling erosion and it was found to be effective. With a decisively coordinated participation of relevant stakeholders, measures that are goal-oriented can always be articulated, adopted, funded and executed.

IV. THE STUDY AREA

Enugu East Local Government Area is one of the three local governments that make up the Enugu Urban, capital of Enugu State. It has boundaries with Igbo-Etiti and Isi-Uzo Local Government Areas to the north, Nkanu East to the East, Enugu North to the South and Udi to the West. (See Figure 3.1).

Figure 3.1: Enugu State of Nigeria
Source: *Enugu State (2014).*

It has a total area of about 383km^2 and a population of 279,089 from 2006 Population Census (Enugu State, 2014). It is made up of large communities and a total of 41 settlement areas of which 13 are urban, ten are semi-urban and 18 are rural. (See Table 3.1).

Table 3.1: Communities in Enugu Local Government Area

S/N	Community	Urban	No of semi (urban)	Settlement (rural)	Total
1	Nike-Uno	1	3	1	5
2	Mbuluowehe Nike	-	-	6	6
3	Mbuluiyiukwu	-	-	6	6
4	Mbulujodo Nike	2	3	3	8
5	Trans-Ekulu	2	4	2	8
6	Abakpa Nike	8	-	-	8

Source: Odo and Iyi, (2008).

The water bodies that crisscross or exist in Enugu East Local Government include Ava River, Iyi-Ukwu River, Iyi-Oku River, Ekulu River, Ululo stream, Onungene strean and Nike Lake. There are however, other smaller rivulets that exist but are mainly waterways that dry up during the dry seasons.

V. DATA PRESENTATION AND ANALYSIS

Flooded Areas of Enugu East Local Government Area : In the study area, the settlement areas in the communities where the flood disaster due occur were selected and studied. The study was based on the water bodies that exist in the area and activities around the water bodies. Homesteads close to the water bodies were equally studied with respect to closeness to the floodable area of the water body and experienced flood disaster over the past three years. Tables 4.1 shows the outcome of the study

Table 4.1: Flooded Area

S/N	Water body	Number of Affected Settlement Areas						Total
		Nike Uno	**Mbuluowehe**	**Mbuluiriukwu**	**Mbulujodo**	**Trans-Ekulu**	**Abakpa**	
1	Ava river	-	1	-	5	-	-	6
2	Iyi ukwu	-	-	1	-		-	1
3	Iyi oku			2	1			3
4	Ekulu river	3	-	-	1	-	1	5
5	Nike lake	-	1		1	-	-	2
6	Others stream	5	6	6	8	8	8	41
Total		**8**	**8**	**9**	**16**	**8**	**9**	**58**

From Table 4.1, Ava River has devastating effects on 6 settlement areas, 1 in mbuluowehe and 5 in Mbulujodo. Iyiukwu River affects 1 in Mbuluiyiukwu while Iyi Oku river affects 2 in Mbuluiyiukwu and 1 in Mbulujodo. Ekulu River affects a total of 5 settlement areas, 3, and 1 each in Nike Uno, Mbulujodo and Abakpa respectively. Nike Lake affects 1 each in Mbuluowehe and Mbulujodo. The seasonal streams were noticed to exist in one way or the other in all the 41 settlement areas. These streams form channels through which runoffs discharge into the rivers. In the study of homesteads and other land use activities found in the prone areas, measurements were taken to determine the setbacks and houses and activities from the bank of the water body. That obtains in each settlement zone. For each activity, the average setback was considered. The information that was relevant in the measurement of the setbacks in the area is that the setback of buildings or other structures from power lines, water bodies, erosion, courses and gullies and communication masts (Agukoronye, 2005) is:

[1] Minimum of 10m in the urban areas.
[2] Minimum of 15m in the rural areas.

Table 4.2 shows the outcome of the study

Table 4.2: Intensity of Activities around Water Bodies

S/N	Activity	Frequency of activity in Communities						Av.Setback (m)
		Nike Uno	**Mbulu owehe**	**Mbulu iyiukwu**	**Mbulu jodo**	**Trans Ekulu**	**Abakpa**	
1	Residential	6	2	2	18	-	6	4.5
2	Commercial	15	-	-	15	2	15	6
3	Industrial	-	-	-	5	-	-	11
4	Place of worship	2	-	-	2	-	2	5
5	Farms	2	6	6	5	-	-	3
	Total	**25**	**8**	**8**	**45**	**2**	**23**	**5.9**

A total of 111 activities in the 6 communities were studied with respect to setbacks from the existing water bodies. For all the activities, the average setback as shown in Table 4.2 is 5.9 metres. The highest setbacks were found among the industrial activities.

Causes of Flooding in Enugu East Local Government Area : During the course of the study, it was observed that major causes of flooding vary from one settlement to the other. However, the aggregate causes include:

[1] Some settlements are in the low-lying areas.
[2] Some culverts are narrow and when there is heavy rain, the flood overflows the area and is diverted to homesteads and other areas.
[3] Blockage of drainage channels with debris from homesteads and industries.
[4] Homesteads close to the waterway.
[5] Homesteads within the floodable area.
[6] Absence of drainage channels.

[7] Narrow drainage channels
[8] Farming very close to the floodable area.
[9] Farming within the floodable area.
[10] Commercial activities within the floodable area.
[11] Industrial activities within the floodable area.
[12] Siltation of water bodies.

Table 4.3 shows distribution of the causes of flooding in the communities.
Table 4.3: Causes of Floods in the Communities

S/N	Cause	Nike-uno	Mbuluowehe	Mbuluiyiukwu	Mbulujodo	Trans Ekulu	Abakpa
1	Low-lying Area	√			√		
2	Narrow culvert	√			√		
3	Blockage of drainage channel	√			√		√
4	Closeness of homesteads	√			√		√
5	Homesteads within waterway	√			√		√
6	Absence of drains		√	√			
7	Narrow drains	√			√	√	
8	Farms close to flood plains		√	√			
9	Farms within flood plains	√			√		√
10	Commercial activities	√			√	√	√
11	Industrial activities						
12	Siltation of water bodies	√	√	√	√	√	√

Potentials for Community Participation in Curbing Flood Disaster in Enugu East L.G.A.
Interview among some community leaders revealed that there has been some actions being taken by the inhabitants of the area to combat the devastating effects of floods. It was however, gathered that there was no organized group that was vested with the task of handling flood disaster issues. In 2013, there was a collation of affected individuals in the different communities. With the collation, the state and local government assistances were sought. Assistance was sought from the Enugu State Emergency Management Agency.
Efforts were, therefore made to explore the possible groups existent in the communities that can be engaged in any organized action to combat flood menace. The groups are community vide and include:

[1] The constituted youth wing (Ogba-n'echeagu)
[2] The Youth Wing
[3] The Christian Men Organization (CMO)
[4] The Christian Women Organization (CWO)
[5] The PDP Youth Wing
[6] The Landlords Association
[7] The Traders Association

The constituted youth wing (Ogba-n'echeagu) is the group vested with the task of overseeing the landed property of each community. The wing is usually made up of representatives from different clans that make up the community. The youth wing refers to an association of all the youths in the community. The Christian Men Organizations (CMO & CWO) are the bodies of Christian men and women in the communities. The PDP youth wing refers to the association of the youth members of the ruling People's Democratic Party.
Other groups and individuals that are germane to the participatory arrangement include:

[1] The Enugu East Local Government Council.
[2] Enugu East Town Planning Authority
[3] The member representing Enugu East and Isi-Uzo Local Government Areas in the House of Representatives.
[4] The Senator representing Enugu East Senatorial Zone of which Enugu East Local Government Area is a part.

[5] Two members representing Enugu East Local Government Area in the Enugu State House of Assembly.
[6] Large Scale industries in the area.
[7] Federal Government establishments in the area.
[8] Enugu State Emergency Management Agency.

VI. DISCUSSION OF FINDINGS

The data analyzed in respect of this study revealed that eventhough flooding of devasting extent does not occur many times in a year, it is the disaster with the greatest socio-economic impact in Enugu East Local Government Area. That is in terms of the homesteads affected and other assets that are lost in the incident. The study was based on experiences within the past three years (2012 - 2013) and part of the present 2014. The most devastating period was in August, 2011 where a considerable number of homesteads were affected and lots of utility infrastructure destroyed. In all, only one life (a child) was lost in 2013.As can be seen in table 4.1 and based on the experiences from the major water bodies in Enugu East Local Government Area, the most affected community is Mbulujodo. The major settlement areas include Iji-Nike, Umuchigbo and Emene, with Umuchigbo recording the highest affected homesteads. Records of devastations in commercial and industrial outfits were more in Iji-Nike and Emene respectively.

It was observed that for almost all the activities in the area, the minimum setback of 10m was not observed, save for the industrial activities. The closeness of these activities, it was believed made the existing waterways to form the nearest dump sites for wastes and debris. These wastes and debris are carried downstream by flood during rains. But the accumulation often times becomes too heavy for the flood, thereby blocking the channels and leading into bursting of flood into homesteads and other areas. In several cases, drainage channels were not found, thereby leaving the entire area prone to flooding. The siltation of the water bodies is another major cause of flood disaster. In this case, the situation effect leaves the waterway at the same level with the entire area, thereby leading to a flat and directionless flow of flood. During the study, the use of sandbags was found to be common among the affected areas to combat the flood menace. Even though the idea of sandbag is less costly, it was not adjudged very effective based on particulars on remedial and preventive measures from literature. There are potential actors in Enugu East Local Government Area that can be of immense utility to curbing flood menace in the area (see Section 4.3).

VII. RECOMMENDATIONS

Based on an overview of this study on community participation in flood disaster management in Enugu East Local Government Area of Enugu urban, Enugu State, the following recommendations are made in order to curb flood disaster in the area.

1. The Local Government Council led by the Chairman should form a committee on erosion control in the area. This will be with a view to galvanizing all stakeholders into action. The committee will be at three levels, namely, local government level, community level and settlement level. The committee at local government will be called the Local Government Flood Control Committee (LGFCC). The committee at the community level will be called the Community Flood Control Committee (CFCC), while the one at the settlement area level will be called the Neighbourhood Flood Control Committee (NFCC).
   The local government Chairman will be the head of LGFCC and to be advised by an LGFCC director who will be a professional in the environmental discipline. Other members will include all elected representatives from the area (House of Assembly, House of Representatives and Senate), representatives from the six large communities, large scale industries and Landlords Association. CFCC will be headed by a community coordinator to be appointed by the Chairman. Other members will include representatives of the groups as found to exist in the communities (see Section 4.3).
   The NFCC will be headed by a leader to be elected in a general meeting of the settlement area. Other members will include representatives of subgroups of the community groups that exist in each settlement area. Figure 6.1 shows the structure of the categories of personnel in the whole arrangement.

The Committees when formed will help in ensuring that:

[1] There is proper education of the people on the dangers of dumping refuse into water channels.
[2] There is coordinated vegetation along the banks of water bodies to break the power of moving flood water.
[3] Retention basins are dug, especially among the very low lying areas.
[4] Adequate drainage channels are constructed and maintained.

The Town Planning Authority should:

[1] Refuse permission to build very close to flood plains by maintaining the standard setbacks.

[2] Put sanctions on those who erect structures illegally to obstruct drainage and other channels.

VIII. CONCLUSION

In this study, the level of and opportunities for community participation for fighting flood disaster in Enugu East Local Government Area has been highlighted. The net finding is that, since there has not been any deliberate arrangement for involving stakeholders in the fight against flood in the area, the level of achievement has remained insignificant. The study revealed that what would stand the participatory approach in good stead would be functioning of the committee structure as recommended. It is a structure whose potentials are virtually untapped. If the officials of the structure are galvanized in accordance with the roles expected of them in service delivery and other conceived stakeholders brought together, efficiency would be achieved in tune with the quest of this study.Another important revelation in the study is that the disaster in the area is minimal when compared to the situation experienced in areas that front big time rivers and oceans. In this case, therefore, the Global Flood Defence Systems and the likes are out of the question in the area. What would rather curb the menace include those measures recommended in this study whose application are both cheap and convenient. They are simple biotechnological approaches which, when duly implemented, will afford a long term resilience to the effects of flood. Appendix A (eSchooltoday, 2014) are simple tips which the committees (at the three levels), it is hoped, can adopt and make a household dossier in Enugu East Local Government Area.

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APPENDIX A

WHAT YOU CAN DO BEFORE, DURING AND AFTER FLOODS. : Sometimes there is no warning of flash floods, and that is why it is important to think of them and prepare for them before they happen. Here are a few things you can do.

Before the Floods : Know about your local relief centers and evacuation routes. Keep emergency numbers and important information handy, as well as emergency supplies, kits, first aid items. These may include water, canned foods; can opener, battery-operated radio, flashlight and protective clothing. Fold and roll up anything onto higher ground (or upper floors of your home), including chemicals and medicines.

Make sure everything that is of importance is secured (jewelry, documents, pets, and other valuables). Plant trees and shrubs and keep a lot of vegetation in your compound if you are in a low-lying area as that can control erosion and help soften the speed of the flowing water.

During the Floods

Flash floods occur in a short spate of time. As soon as they start, be quick, keep safe and ensure that children and elderly are safe by leaving the house to a higher ground.

Turn off all electrical appliances, gas, heating and the like if there is a bit of time.

Leave the area before it gets too late. Do not drive through the water as moving water can sweep you away.

Stay away from power lines or broken power transmission cables.

Try to keep away from flood water as it may contain chemicals or other hazardous materials.

After the Floods

1. Make sure you have permission from emergency officers to get back inside your house.

2. Keep all power and electrical appliance off until the house is cleaned up properly and an electrical personnel has confirmed that it is OK to put them on.
3. Make sure you have photographs, or a record of all the damage, as it may be needed for insurance claims.
4. Clean the entire home, together with all the objects in it very well before you use them again. They may be contaminated.
5. Wear appropriate gear (mask and gloves) before cleaning begins.