



Community Capacity and Needs Assessment To Flood Hazard In Selected States In The Niger Delta, Nigeria.

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ABSTRACT

The study titled: community capacity and needs assessment to flood hazard in selected states in the Niger Delta, Nigeria. The objectives are: To identify the categories of vulnerabilities to flood hazard, (physical, material, economic, social, organizational, political, attitudinal, & motivational) that best describes the situation of the study area and identify the laws and policies which provide a formal basis for counter disaster action in the study states. The population of the study consists of communities affected by flood within the Niger Delta States. Random sampling methods were adopted in selecting the sample size of the respondents while (9) representative communities vulnerable to the flood events of the three sampled States were considered. Questionnaires were used for data collection by applying the PRA technique. Data collected were analyzed using both descriptive and inferential statistics to determine the mean and standard deviation of respondents sampling. The finding of the study reveals that the low-lying nature of the area and proximity to the river bank makes it vulnerable to seasonal flood. Some of the floods particularly the 2012 floods have been very devastating. These resulted in loss of crops and livestock which is the main source of livelihood of the people. The findings show that although the people have not recovered from the effects of past floods, they have become resilient to the flood hazard. Some of the coping mechanism includes; relocation from the flood plain, reconstruction of houses with reinforced materials (that is with bricks and blocks as against the predominant mud/thatch houses), raising of houses above annual flood levels, erection of temporary houses along river banks, creation of water channels for easy evacuation of floods, frequent dredging of drainage outlets, construction of dykes using sand bags and fumigation of stagnant flood water against mosquito parasites. The study recommends public enlightenment campaign, early warning, development of safety nets among others.

KEY WORDS: PRA, VCA, CAPACITY, VULNERABILITY.

Received 17 October, 2021; Revised: 30 October, 2021; Accepted 01 November, 2021 © The author(s) 2021. Published with open access at www.questjournals.org

I. INTRODUCTION

Climate change and human induced factors are part of disaster risk management that stimulates community flooding in selected states in the Niger Delta. Some literatures on climate change like (IPCC, 2008) accept that climate change can cause flooding to occur more frequently and be more severe in the rural and urban areas since runoff cannot be completely be accommodated only by drainage network. (Wizor and Week, 2014) also view flooding as common natural disaster occurring in most parts of the world resulting in damages and loss of human life and livelihood sources, deterioration of environment and retardation to development, another scholar (Jeb and Aggarwal, 2008) opined that in tropical regions floods of high magnitude have resulted to serious consequences as a result of heavy rainstorms, hurricanes, snow meltdown and dam failures. In Africa “within the year” 1900 to 2006 flood disaster has killed about (20,000) people and affected nearly forty million

or more, and caused damage estimated at 4 billion US dollars (Genene et al. 2007), Amangabara, (2010), flood affects and displaced more people and caused more damage to properties than any other natural hazards in Nigeria, the Nigeria voice, 6th Nov, (2012), people are seen scooping water from their building or homes; these are common sights in the metropolis during wet season.

In the last eight years coastal and flash flooding has caused serious negative impacts on the citizens across 30 out of 36 States of Federal Republic of Nigeria. Several communities in Bayelsa, Delta and Rivers States have consistently since eight years ago suffered flood impacts whenever it rains heavily, in 2012 and 2018 flood disaster as declared by NEMA recorded damage of movable properties, infrastructures, destruction of social services, created physical and psychological trauma, environmental degradation, pollution of water, multiple infection, loss of lives, and livelihoods of the people.

In spite of the institutions responsible to manage disaster in Nigeria at national, state and local government level like NEMA, SEMA, LEMA, NIMIET and other non governmental institutions they failed to manage flood events or reduce the extent of damages recorded by citizen's resident in the study areas. The communities that experienced flood disaster in the year 2012 and 2018 are likely not to be knowledgeable about what contents make up a disaster risk management or policies that could help them reduce flood impacts and assure their safety except few in the academics. However, the DRM plan in line with NEMA policies at the public domain suggest fantastic policies but it seems NEMA and other management agencies are currently focusing on reactive measures to rescue and provide relief materials, their actions so far suggest they operate a top-down method rather than down-top method that encourages local or community participation to assess, identify the inherent risk and proffer workable DRM plan at local level. According to (North, 2014) disaster management plan at national, provincial and local level are available and updated every year but the public authorities failed to manage the flood, reduce damage to properties and community vulnerability. (NDMA, 2014a; PDMA, 2014) stated that assessing local level vulnerability which is the key determinant of disaster risk" (IPCC, 2012)), and taking adaption and disaster risk reduction (DRR) measures due to the low level of understanding of these concept in public sector disaster and development circle (Shahid, 2012; MCII, 2015).

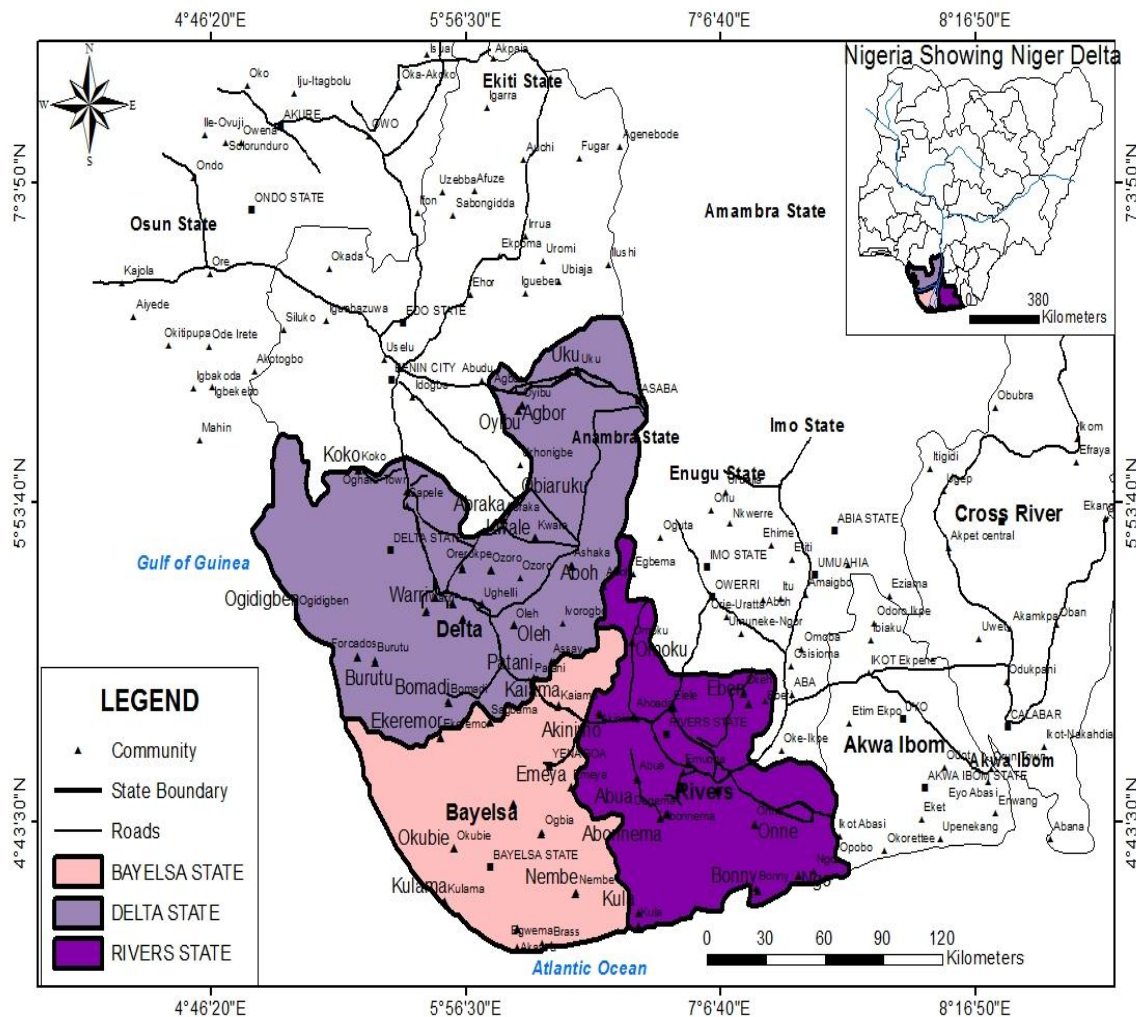
Vulnerability assessment is by taking the consequent measures to reducing flood impacts on communities (CICERO, 2000; Shahid, & Piracha, 2010). Top down measure is focused more on identifying vulnerable people and the approaches using mapping for vulnerability and risk assessment which implies reactive in nature rather than Down-Top that dwell in identifying the causes and how to proactively reduce the future impacts, for example: Rafiq & Blaschke, (2012); Uddin et al., (2013); and other government studies could not contribute meaningfully in the aspects of reducing flood impacts and losses because of the use of top-down approach. These approaches are unable to identify the vital social drivers of vulnerability and local ability to adapt (Adger et al., 2007) as compared to the community-based approaches which are effective to this end, (O'Brien et al., 2004; Tompkins & Adger, 2005).

The community assessment of vulnerable categories and factors that either contribute or reduce vulnerability level, based on the people pressing needs is absent in the research circle of the flood affected communities in selected States in the Niger Delta. PRA approach in VCA help to identify their strength and weakness in order to build on capacities, improve resilience and sustain development of the rural communities in the study area, More so, assessing the community vulnerability to flood hazard after experiencing such magnitude of disaster event in 2012 and 2018 before and after exposures is necessary to record the formal and informal changes according to (Birkmann, 2008; Birkmann et al., 2004; Tompkins & Adger, 2005). Since the past flood events has caused changes in the structures of the communities and working of the institutions that provides disaster risk management and alter the behavior or life style of the people, to reduce vulnerability the research is very necessary to enhance spatial planning which is an effective DRR tool to sustain development of the flood affected communities and improve their resilience through adaptive capacity. The research question tend to ask, what categories of vulnerabilities to flood hazard, physical, material, economic, social, organizational, political, attitudinal, & motivational that best describes the situation of the study states?, and what laws and regulations provide a formal basis for counter disaster action in the study area?, while the aim of the study focus to assess capacity and flood vulnerability in selected States in the Niger Delta. The specific objectives tend to: identify the categories of vulnerabilities to flood hazard, physical, material, economic, social, organizational, political, attitudinal, & motivational that best describes the situation of the study area; and identify the laws and policies which provide a formal basis for counter disaster action in the study states;.

Study Area

The study area is located in Niger Delta region, and share part of the Delta in Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria, located within the coasted Southern Nigeria States, and stretched through latitude the 4^o 43' 30."N and 5^o 53.40" N while longitude 4^o 46' 20" E and 8^o 16' 50" E. The study area comprises Bayelsa, Delta and Rivers States as core Niger Delta States in (Map 1.1). The three States amongst others have electoral and economical values that sustain Nigeria as a nation, it was

sometime called oil Rivers due to palm oil production and later called oil Rivers protectorate from 1885 until 1893 when it was expanded and became Niger coast protectorate, and also known as petroleum rich region. It can also be described as a center of international controversy over pollution, upon its geographical areas within 70,000km² (27,000 sq m) which make up part of 7.5%.



Map 1.1: Core Niger Delta
Source: Rivers State Ministry of Land and Housing

II. MATERIAL AND METHOD

This research on capacity and needs assessment of residents who are affected by flood events as selected of three states in the Niger Delta, Nigeria is very necessary because the study area over the years has experienced pockets of flash flooding, coastal flooding and other types of flooding, the 2012 flood disaster which affected 30 State out of 36 States of Federal Republic of Nigeria and 2018 floods disaster which also affected Bayelsa, Delta and Rivers States among other six states as declared by NEMA, (2018) also describe the area as flood zone area because of its low lying plain.

In spite of the human induced factors that stimulates flooding in the rural and urban settlements in the study area, climate change according to (Seneviratne et al., 2012) has been a major factor with increase in "...frequency, intensity, spatial extent, duration and timing" of natural hazards, the hazard has been reported as prominent cause to several disasters across communities, regions in the world thereby increased the vulnerability and risk to damage of people and properties. (NASA, 2015) also holds the opinion that flood has increase the risk of damage, while (Mertz et al., 2009; Ayers et al., 2014) opined those vulnerabilities of communities particularly for the poor of global south on flooding has increased; this statement expresses the situation of the study area.

To achieve the aim and objectives of the study, a cross sectional research was adopted to ensure the researcher does not interfere with the subject of the investigation rather intend to observe the phenomena under consideration. Cross sectional research design can be defined as a type of design concern with observational

study; it deals with the investigational measure to the outcome and exposure of the study participants at the same time (Sardana et al., 2016, p. 61:45-52); (Shinde et al., 2009, p.75:41-6). Unlike the case of control studies where participants are selected based on the outcome status or cohort studies where the participants are selected based on the exposure status, but in cross sectional research study participants are selected based on the inclusion and exclusion criteria set of the study. In line with (Chaudhuri 2003) assertion on the use of cross-sectional design, that household is vulnerable if a shock (flood) is likely to push them below a predetermined welfare threshold (poverty line), consequently, vulnerability becomes the result of the cumulative process of risk and response. As a result, the term distinguishes poverty and vulnerability is risk, this position agrees that once the selection of participants is done, the investigator commences the study to assess the exposure and the outcomes. Cross sectional design is used for population-based survey and to assess the prevalence of such impacts associated to flood hazard, the vulnerability and capacity that either makes the population susceptible by increase in vulnerability or decrease in vulnerability is considered to improve the resilience of the local people, in line with the study carried out by (Sardana et al., 2016); (Shinde et al., 2009).

In the context of this study vulnerability, exposure and susceptibility are the important factors that magnify the weakness or strength of the communities upon the six categories or characteristics of vulnerability livelihoods to include: social, economic, political, attitudinal, material and physical aspects which assess through the PRA method.

The advantages of cross-sectional design are not limited to prove or disprove assumptions, not costly to perform and doesn't require sufficient time to carryout research, is consistent to capture the specific points on time, it contains multiple variables at the time of data snapshots, the required data can be use for several types of research, while several findings and outcomes can be analyzed in order to create new theories or studies in a depth research work. However, the disadvantages are limited to include: ineffective use to analyze behavior, ineffective use to determine cause and effect, time of snapshot is never guaranteed as representative, findings can be flawed or skewed when there is conflicts interest with funding source, may record huge challenges in putting together the sampling pool based of the population variables being studied.

Longitudinal study also referred as longitudinal survey or panel study was also adopted, the research is based on the repetition of observation of same variables like people over a short period of time, it can be structured as longitudinal randomization experiments. The analysis can be retrospective or prospective in acquiring database, it tracks the same people and differences observed in those people are less likely to be seen as the result of the cultural differences across generation.

The collected data will be analyzed qualitatively and quantitatively, the weights in PRA of communities selected in the study states will be aggregated with averaged or mean and standard deviation separating in respective flood events of 2012 and 2018 where necessary, and consideration of state wise to arrive at the final weight to be classified/prioritized with regards to severity of vulnerability of flood hazard the urgency of coping capacity/adaptive measures. The comparison of PRA of the both flood disasters will show the fluctuation in vulnerability, coping and adaptation of community. The household survey will be analyzed using MS Excel and SPSS to produce cross tables and charts or table for comparing different factors of the three selected states in Niger Delta. The research will further explore the use of triangulation where necessary with respect to qualitative and quantitative analysis to examine the similarities and differences; to provide a likely linkage of formal and informal changes; and proffer a global/community base recovery process that will improve resilience of the people in the study area. Frequency tables were constructed to indicate responses from each item used while inferential statistics. However, responses were coded, processed, and entered into the computer using Microsoft excels and word programmes.

Sampling Technique

The simple random sampling technique were utilized to enhance the administering of certain copies of the structured questionnaires to community's household heads of population affected by 2012 and 2018 flood disasters within the local government areas in the Niger Delta selected States, to achieve this purpose the lottery method will be applied.

Sample Size Determination

The Taro Yamani formula that enhances equal opportunity of selection shall be adopted and put in use to determine the research study sample size in relation to the study area population households, the calculated sample size will give an idea of a certain numbers of the study area population to be administered with questionnaires focused in achieving the research objectives without bias.

Taro Yamani formula is written as thus:

$$n = N/1+N*(e)^2 \dots\dots\dots 1$$

Where:

n = sample size

N = population

1 = 1 is constant

e = error limit or margin of error or level of precision at 5% or $(0.05)^2$

To determine the sample communities in the three selected states in Niger Delta, the proportional method will be applied as written below:

$$n_h = (N_h/N) * n \dots\dots\dots 2$$

Where n_h is the sample size for stratum h ,

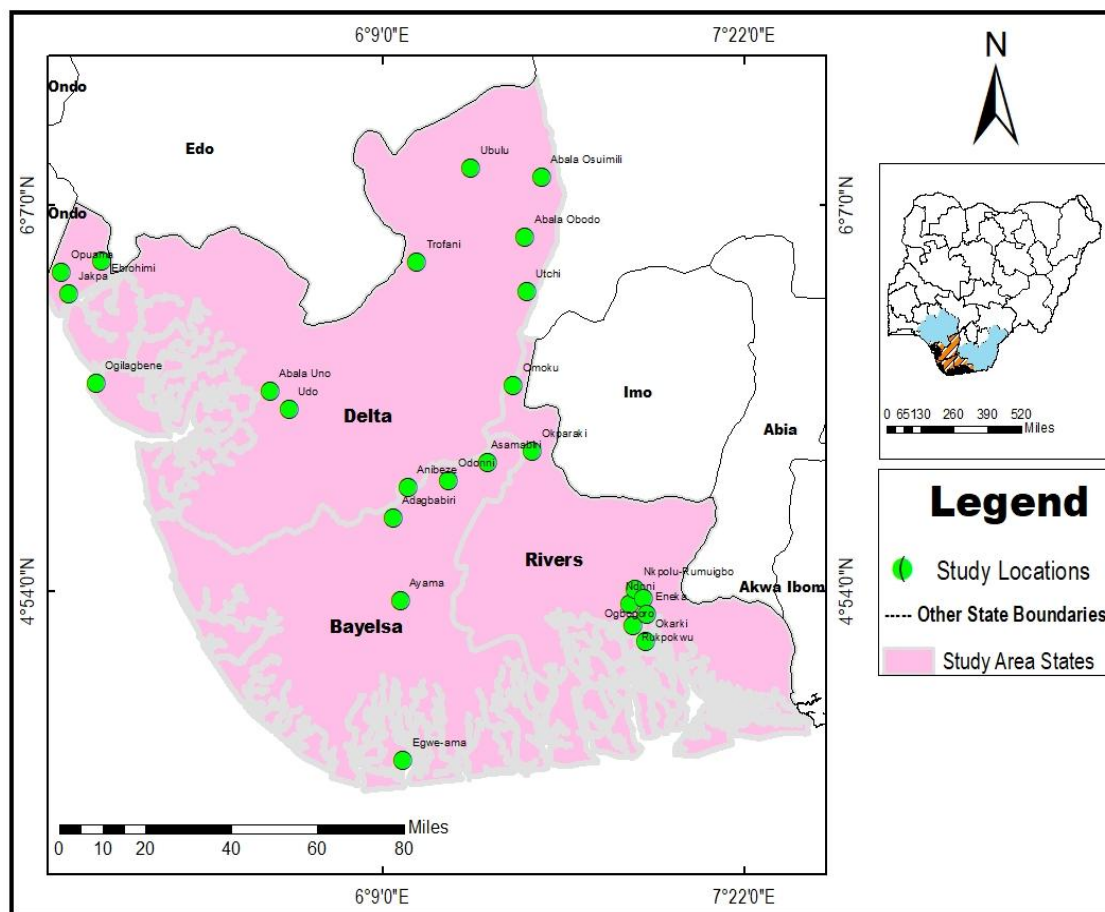
N_h is the population size for stratum h ,

N is the population size,

n is the total sample size, Applying the formula,

Table 2.1: the computed population and sample size relative to flood affected nine representative communities in the selected Niger Delta States
Source: Author's Computation, 2019.

| S/No | Study State | Sample Communities | Communities Population 1991 Census, Nigeria | Communities 2006 Population Projection Based 2.9% Growth Rate NPC Standard @ 15 Years | Communities 2019 Population Projection Based 3.4% Growth Rate NPC Standard @ 13 Years | Communities Sample Size Calculation | Communities Expected Sample Size |
|------|----------------|---|---|---|---|-------------------------------------|----------------------------------|
| 1 | Bayelsa | Trofani | 2,326 | 3337.81 | 4813.12202 | 39.91277663 | 39 |
| 2 | | Adagbabiri | 2,490 | 3573.15 | 5152.4823 | 42.72691909 | 43 |
| 3 | | Asamabiri | 2,617 | 3755.395 | 5415.27959 | 44.90616355 | 45 |
| | | Total | 7,433 | 10666.36 | 15380.88 | 127.5459 | 127 |
| 1 | Delta | Jakpa | 1,252 | 1796.62 | 2590.72604 | 46.92761087 | 47 |
| 2 | | Abala Uno | 2,088 | 2996.28 | 4320.63576 | 78.26266094 | 78 |
| 3 | | Abala Obodo | 1,011 | 1450.785 | 2092.03197 | 37.8944206 | 38 |
| | | Total | 4,351 | 6243.69 | 9003.39 | 163.085 | 163 |
| 1 | Rivers | Rukpokwu | 5,080 | 7289.8 | 10511.8916 | 26.74530916 | 27 |
| 2 | | Ogbogoro | 9,360 | 13431.6 | 19368.3672 | 49.27875861 | 49 |
| 3 | | Eneka | 6,219 | 8924.265 | 12868.7901 | 32.74194442 | 33 |
| | | Total | 20,659 | 29645.7 | 42,749 | 108,766 | 109 |
| | | Grand Total Expected Sample Size | | | | | 399 |



Map 2.1 Study Area Locations

III. RESULTS AND DISCUSSION

This chapter dealt with the presentation, analysis, and interpretation of data resulting from the field survey illustrated using the procedure and statistical tool described in chapter three. The presentation and analysis of specific data were done in line with the objectives of the study.

A total of three hundred and ninety-nine (399) questionnaires were administered to respondents in the area of study. All the three hundred and ninety-nine (399) questionnaires were received adequately filled as follows Bayelsa 127(31.8%), Delta 163(40.9%) and Rivers 109(27.3), giving a percentage response of 100.0%. Mugenda (2003) argues that a response rate of 50 % or higher is adequate for data analysis. This implies that 100.0% response rates were very appropriate for data analysis.

First, the data showing the demographic characteristics of the respondents in the study area were presented and discussed. To identify the categories of vulnerabilities to flood hazard, physical, material, economic, social, organizational, political, attitudinal, & motivational that best describes the situation of the study area. and to identify the laws and policies which provide a formal basis for counter disaster action in the study states.

Finally, the chapter was concluded with a discussion of the findings of the previous study.

3.2 Socio-Economic Characteristics of Respondents

Respondents' gender ratio in table 3.2 was included to gain a perspective on the assessment of vulnerability and capacity of flood hazard in selected states in the Niger Delta.

Table 3.2: Gender of the Respondents

| States | Gender | | Total |
|---------------|--------------------|--------------------|------------------|
| | Male | Female | |
| Bayelsa State | 85(21.3%) | 42(10.5%) | 127 (31.8%) |
| Delta State | 134(33.6%) | 29(7.3%) | 163 (40.9%) |
| Rivers State | 76(19.0%) | 33(8.3%) | 109(27.3%) |
| Total | 295 (73.9%) | 104 (26.1%) | 399(100%) |

Source: Researcher's Fieldwork, 2021

The results show a total of three hundred and ninety-nine 399(100.0%) with 85(21.3%) male and 42(10.5%) females in Bayelsa, 134(33.6%) male, 29(7.3%) female in Delta and 76 (19.0%) male, 33(8.3%) females in Rivers responded to the instrument. The majority were males who contributed 295 (73.9%) and females contributed only 104 (26.1%). Everyone participated in the study by completing the questionnaire. This implies that there are more males than females in the study areas.

Years Lived in the Community

The participants were asked for how long they had been living in the studied communities and their responses are as summarized in table 3.3 below.

Table 3.3: Duration of Stay in the Area

| State | (Years) | | | Total |
|---------------|------------------|--------------------|-------------------|------------------|
| | 1-5 | 6-10 | 10 and above | |
| Bayelsa State | 17(4.3%) | 38(9.5%) | 72(18.0%) | 127 (31.8%) |
| Delta State | 22(5.5%) | 44(11.0%) | 97(24.3 %) | 163 (40.9%) |
| Rivers State | 9(2.3%) | 32(8.0 %) | 68(17.0%) | 109(27.3%) |
| Total | 48(12.0%) | 114(28.6 %) | 237(59.4%) | 399(100%) |

Source: Researcher’s Fieldwork, 2021

Table 3.3 revealed the duration respondents have lived in their respective community as follows: 1-5years 17(4.3%), 6-10 years 38(9.5%), 10years and above 72(18.0%) for Bayelsa State, Delta State: 1-5 22(5.5%), 6-10 44(11.0%) and above 10years 97(24.3%) while for Rivers 1-5years 9(2.3%), 6-10years 32(8.0%) and above 10years 68(17.0%).

The overall results on duration of stay in the area indicated that 48 (12.0%) of the respondents from the three sampled States had lived for 5 years and below while 114 (28.6%) had lived for a period of 6-10 years. On the other hand, the majority 237 (59.4%) of the respondents had lived for 10years and above. This revealed that the years respondents lived in their present community may be adequate for them to give reliable information on the history on flood vulnerability in the study areas.

Level of Education

Respondents’ level of education is important to indicate their ability to respond satisfactorily to questionnaires and reduce incidents of uncertainty or no opinion responses (Malhotra 2004).

Table 3.4 Level of Education

| State | Education Level | | | | Total |
|---------------|-----------------|-------------------|-------------------|------------------|------------------|
| | Primary | Secondary | Graduate | Others | |
| Bayelsa State | 7(1.8%) | 62(15.5%) | 56(14.0%) | 2(0.5%) | 127 (31.8%) |
| Delta State | 5(1.3 %) | 58(14.5 %) | 73(18.3%) | 27(6.8%) | 163 (40.9%) |
| Rivers State | 11(2.8%) | 25(6.3%) | 59(14.8%) | 14(3.5%) | 109(27.3%) |
| Total | 23(5.8%) | 145(36.3%) | 188(47.1%) | 43(10.8%) | 399(100%) |

Source: Researcher’s Fieldwork, 2021

The results presented in Table 3.4 show the educational qualifications of the respondents across the three sampled States of Niger-Delta Region. Accordingly, Bayelsa 7(1.8%), Delta 5(1.3 %), and Rivers 11(2.8%) which is 23(5.8%) of the entire respondents are holders of FSLSC certificate; 145(36.3%) with Bayelsa 62(15.5%), Delta 58(14.5%) and Rivers 25(6.3%) have SSCE certificate; 188(47.1%) with Bayelsa 56(14.0%), Delta 73(18.3%) and Rivers 59(14.8%) had bachelor’s degree while the remaining 43(10.8%) are had other qualification with Bayelsa 2(0.5%), Delta 27(6.8%) and Rivers 14(3.5%) respectively.

Table 3.5 Main Occupation of Respondents

| State | Farming | Fishing | Business men/women | Civil servant | Student | Total |
|--------------------|-------------------|-----------------|--------------------|------------------|------------------|------------------|
| Bayelsa State | 34(8.5%) | 11(2.8%) | 41(10.3%) | 24(6.0%) | 17(4.3%) | 127 (31.8%) |
| Delta State | 41(10.3%) | 7(1.8%) | 54(13.5%) | 37(9.3%) | 24(6.0%) | 163 (40.9%) |
| Rivers State | 36(9.0%) | 13(3.3%) | 39(9.8%) | 12(3.0%) | 9(2.3%) | 109(27.3%) |
| Grand total | 111(27.8%) | 31(7.8%) | 134(33.6%) | 73(18.3%) | 50(12.5%) | 399(100%) |

Source: Researcher’s field work, 2021

Table 3.5 shows that 111(27.8%) of the respondents engage in crop farming, 31(7.8%) engage in fishing, 134(33.6%) are into business, 73(18.3%) are civil servants and 50(12.5%) are students. This show that business and farming activities are the major sources of livelihood of the dwellers in the study area.

Table 3.2.6 Household Monthly income before the flood disaster

Source: Researcher's field work, 2021

| State | 0-5,000 | 6,000-10,000 | 10,000-20,000 | 20,000-50,000 | 80,000-100,000 | 100,000 and above | Total |
|--------------------|----------------|-----------------|------------------|-------------------|--------------------|-------------------|--------------------|
| Bayelsa State | 2(0.5%) | 11(2.8%) | 17(4.3 %) | 25(6.3%) | 55(13.8 %) | 17(4.3 %) | 127 (31.8%) |
| Delta State | 0(0.0%) | 2(0.5%) | 19(4.8 %) | 51(12.8%) | 79(19.8%) | 12(3.0%) | 163 (40.9%) |
| Rivers State | 0(0.0%) | 5(1.3%) | 13(3.3%) | 26(6.5%) | 52(13.0%) | 13(3.3%) | 109(27.3%) |
| Grand total | 2(0.5%) | 18(4.5%) | 49(12.3%) | 102(25.6%) | 186(46.6 %) | 42(10.5%) | 399(100%) |

Table 3.6 shows the percentage responses of the respondent's income before the flood.

The percentage scores indicates that most of the respondents, 46.6% earn between 80,000-100,000 monthly while 25.6% earn between 20,000-50,000. However, 12.3% of the respondents earn between 10,000-20,000; 10.5% earn 100,000 and above and 4.5% earn 6,000-10,000 respectively. The least monthly income of the respondents (0-5,000 constitute 0.5%.

Table 3.7 Monthly income of the respondents after the flood disaster

| State | 0-5,000 | 6,000-10,000 | 10,000-20,000 | 20,000-50,000 | 80,000-100,000 | 100,000 & above | Total |
|--------------------|------------------|--------------------|-------------------|------------------|----------------|-----------------|------------------|
| Bayelsa State | 12(3.0%) | 30(7.5%) | 72(18.0%) | 9(2.3%) | 4(1.0%) | 0(0.0%) | 127 (31.8%) |
| Delta State | 9(2.3%) | 46(11.5 %) | 83(20.8%) | 21(5.3%) | 3(0.8%) | 1(0.3 %) | 163 (40.9%) |
| Rivers State | 7(1.8 %) | 27(6.8 %) | 57(14.3%) | 16(4.0%) | 2(0.5%) | 0(0.0 %) | 109(27.3%) |
| Grand total | 28(7.0 %) | 103(25.8 %) | 212(53.1%) | 46(11.5%) | 9(2.3%) | 1(0.3%) | 399(100%) |

Source: Researcher's field work, 2021

Table 3.7 result show that within 1-12 months after the flood, the average income of 212(53.1%) of the respondents was between 10,000-20,000 while 103(25.8%) of the respondents earned between 6,000-10,000. The percentages of respondents earning between 20,000-50,000 was 46(11.5%), 28(7.0%) of the respondents earned between 0-5,000, 9(2.3%) of the people earned between 80,000-100,000 while only 1(0.3%) of the respondents earned above 100,000. From the findings, it is clear that income of the respondents reduced after the flood when compared with the people income before the flood.

3.8 Categories of vulnerabilities to flood hazard

Table 3.8 Social/Organizational/Political Vulnerability

| Items | Total per State | | | | | |
|---|-----------------|------|-----------|------|------------|------|
| | Bayelsa=127 | | Delta=163 | | Rivers=109 | |
| | X̄ | Std | X̄ | Std | X̄ | Std |
| 1 Polygamous families are likely to be more affected by the 2012 & 2018 flood disaster | 4.54 | 0.91 | 4.52 | 0.90 | 4.44 | 0.89 |
| 2 Children and elderly are most likely to be affected by flood events | 4.88 | 0.98 | 4.76 | 0.95 | 4.48 | 0.90 |
| 3 Persons without basic education are likely to be more affected by flood events than persons with basic education. | 4.45 | 0.89 | 4.61 | 0.92 | 4.40 | 0.88 |
| 4 Households' members between 4 and 5 are likely to be more in flood areas than those with less members. | 4.20 | 0.84 | 4.72 | 0.94 | 4.34 | 0.87 |
| 5 Low attendance of school children is likely to be recorded during flood events. | 4.82 | 0.96 | 4.61 | 0.92 | 4.72 | 0.94 |
| 6 High attendance of school children is likely to be recorded after flood events. | 4.75 | 0.95 | 4.60 | 0.92 | 4.59 | 0.92 |
| 7 Host community relationship with companies operating in their areas enjoyed company assistance during and after flood events. | 2.28 | 0.46 | 2.18 | 0.44 | 2.13 | 0.43 |
| 8 In the event of flood disaster, communities' members are exposed to diseases during and after the events. | 4.85 | 0.97 | 4.79 | 0.96 | 4.82 | 0.96 |
| 9 Government responsibilities is to provide good health care centers to help address health related issues. | 4.84 | 0.97 | 4.72 | 0.94 | 4.72 | 0.94 |
| 10 The affected communities were provided with health facilities to help address health issues before and after flood events in your community. | 2.14 | 0.43 | 2.19 | 0.44 | 2.08 | 0.42 |
| 11 The organizational structure of the community before disaster events was fairly okay. | 4.19 | 0.84 | 4.58 | 0.92 | 4.46 | 0.89 |

| | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Grand Mean (\bar{X}) & Std | 4.13 | 0.83 | 4.11 | 0.82 | 4.02 | 0.80 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|

Source: Researcher's Fieldwork, 2021

Table 3.8 shows the social/organizational/political categories of vulnerability to flood hazard among respondents across the sampled States in Niger Delta.

From the result in table 2.8 it indicates that the respondents from the three sampled States agreed with items 1, 2, 3, 4, 5, 6, 8, 9 and 11 which show high level of vulnerability of the above items to flood hazards in the study area. Items 7 and 10 attracted disagreement from the respondents across the studied States which is an indication that host communities' relationship with companies operating in the areas do not get company assistance during and after flood events and also that the affected communities were not provided with health facilities to help address health issues before and after flood events in your community.

Table 3.9 Economic Vulnerability

| Items | Total per State | | | | | |
|-------|---|-----|-----------|-----|------------|-----|
| | Bayelsa=127 | | Delta=163 | | Rivers=109 | |
| | \bar{X} | Std | \bar{X} | Std | \bar{X} | Std |
| 1 | The financial earning of households/family members/community population before flood events was fairly adequate. | | | | | |
| 2 | The occupation of the people like farming, daily market/shop sales, livestock/poultry, street sales, fishery were impacted negatively due to flood events thereby created low earning. | | | | | |
| 3 | Government created a resilience approach to resuscitate community-based occupation by providing financial grants, and several relief materials to facilitate earning of the affected population. | | | | | |
| 4 | Flood impacts led to the decrease of community population earning. | | | | | |
| 5 | Land ownership in the flood affected communities is owned through inheritance, purchase, rent, short or long lease, voluntary transfer, and hijacking which create issues most times in communities. | | | | | |
| 6 | Damaged houses due to flood event was rebuild through self-savings, monthly salary without government grant, soft loan or insurance scheme. | | | | | |
| 7 | Startup of business after flood events like farming, livestock/poultry, small scale market etc. was made possible through government pay-back loan to those affected by 2012 and 2018 flood disaster. | | | | | |

Grand Mean (\bar{X}) & Std

Source: Researcher's Fieldwork, 2021

Table 3.9 indicates the mean and standard deviation of 4.17(0.83) for Bayelsa, 3.95(0.79) for Delta and 3.68(0.74) of the respondents across the study area agreed that the financial earning of households/family members/community population before flood events was fairly adequate. Respondents from the three States agreed that the occupation of the people like farming, daily market/shop sales, livestock/poultry, street sales, fishery were impacted negatively due to flood events thereby created low earning with the Bayelsa mean rating of 4.94(0.99), Delta 3.61(0.72) and Rivers 3.58(0.72) respectively.

Respondents from Delta and Rivers with the mean and standard deviation of 3.74(0.75) and 3.53(0.71) respectively agreed that Government created a resilience approach to resuscitate community-based occupation by providing financial grants, and several relief materials to facilitate earning of the affected population, while Bayelsa respondents with the mean rating of 2.02(0.40) disagreed. Respondents agreed that Flood impacts led to the decrease of community population earning with the mean rating of Bayelsa as 4.27(0.85), Delta 3.83(0.77) and Rivers 3.49(0.70).

Respondents across the study States agreed that land ownership in the flood affected communities is owned through inheritance, purchase etc. with the mean of 4.67(0.93) for Bayelsa respondents, 3.90(0.78) for Delta and 3.44(0.69). On damaged houses due to flood event was rebuild through self-savings, monthly salary without government grant, soft loan or insurance scheme attracted a general agreement from the respondents with Bayelsa mean of 4.76(0.95), Delta 3.71(0.71) and Rivers 3.56(0.71). Further, item 7 which state that Startup of business after flood events like farming, livestock/poultry, small scale market etc. was made possible through government pay-back loan to those affected by 2012 and 2018 flood disaster attracted a general disagreement from respondents.

From the result of the findings, it indicates that majority agreed with the items. It implies the level of Economic Vulnerability in the studied areas to flood hazards.

Table 3.10 Physical/Material Vulnerability

| Items | Total per State | | | | | | |
|----------------------------------|--|------|-----------|------|------------|------|------|
| | Bayelsa=127 | | Delta=163 | | Rivers=109 | | |
| | X̄ | Std | X̄ | Std | X̄ | Std | |
| 1 | Housing ownership that is more in the flood affected community range from owned houses, rented apartments etc. | 4.66 | 0.93 | 3.70 | 0.74 | 3.56 | 0.71 |
| 2 | The flood affected communities are close to river, canal adjacent to road without drainage, close to dyke or dug pit, close to wet land/forest 2 or 3 meter below the roads. | 4.61 | 0.92 | 3.75 | 0.75 | 3.60 | 0.72 |
| 3 | Lots of houses were damaged during 2012 and 2018 flood disaster in the research communities. | 4.67 | 0.93 | 3.77 | 0.75 | 3.58 | 0.72 |
| 4 | The extent of damage of houses close to flood plain area was high. | 4.78 | 0.96 | 3.90 | 0.78 | 3.62 | 0.72 |
| 5 | The type of houses within the flood plain area include: mud houses, cement houses, batcher houses and bricks houses. | 4.87 | 0.97 | 3.77 | 0.75 | 3.69 | 0.74 |
| 6 | The extent of building regulations/ awareness at the community level is inadequate. | 4.91 | 0.98 | 3.77 | 0.75 | 3.81 | 0.76 |
| 7 | The access road linking community and major roads was flooded during 2012 and 2018 flood events. | 4.64 | 0.93 | 3.82 | 0.76 | 3.74 | 0.75 |
| 8 | The road network in the flood affected areas are is generally poor. | 4.84 | 0.97 | 3.92 | 0.78 | 3.72 | 0.74 |
| 9 | The source of drinking water in the affected community is derived from well, hand pump, river, and pond. | 4.96 | 0.99 | 3.79 | 0.76 | 3.71 | 0.74 |
| 10 | Households test the water to confirm purity before drinking. | 2.09 | 0.42 | 2.63 | 0.53 | 2.73 | 0.55 |
| Grand Mean (X̄) & Std | | | | | | | |

Source: Researcher's Fieldwork, 2021

Table 3.10 presents the analyzed responses of the respondents across the three sampled States. The item statements 1, 2, 3, 4, 5, 6, 7, 8 and 9 were accepted with mean of 4.66, 3.70, 3.56; 4.61, 3.75, 3.60; 4.67, 3.77, 3.58; 4.78, 3.90, 3.62; 4.87, 3.77, 3.69; 4.91, 3.77, 3.81; 4.64, 3.82, 3.74; 4.84, 3.92, 3.72; 4.96, 3.79 and 3.71 respectively; while item statements 10 was rejected with mean of 2.02, 2.63 and 2.73 respectively. The findings showed that the respondents accepted that the Physical/Material Vulnerability to flood hazards is high which required urgent attention from government and NGOs respectively.

3.11 Provision of Disaster Action Laws and Policies

Table 3.11 Disaster Action Laws and Policies

| Items | Total per State | | | | | | |
|-------|--|------|-----------|------|------------|------|------|
| | Bayelsa=127 | | Delta=163 | | Rivers=109 | | |
| | X̄ | Std | X̄ | Std | X̄ | Std | |
| 1 | Disaster Risk Management & Disaster Risk Reduction laws/policies/regulations advices for location zoning map of flood hazard as part of preparedness measures to control flood impacts. | 4.17 | 0.83 | 4.22 | 0.84 | 4.17 | 0.83 |
| 2 | Land use zoning or building regulations are part of laws of rural and urban development to control flood hazard. | 4.15 | 0.83 | 4.43 | 0.89 | 3.83 | 0.77 |
| 3 | DRM & DRR laws and regulations encourages disaster contingency plan to identify evacuation routes and IDP shelter zone on hazard area before and after event. | 4.06 | 0.81 | 4.11 | 0.82 | 4.10 | 0.82 |
| 4 | Contingency plans should be circulated to communities, especially flood zone communities to allow local level participation. | 4.16 | 0.83 | 4.29 | 0.86 | 4.09 | 0.82 |
| 5 | DRM & DRR laws/regulations create planned control measures to preserve natural conservation to reduce flood hazard. | 4.09 | 0.82 | 4.32 | 0.86 | 2.70 | 0.54 |
| 6 | DRM & DRR regulations/policies create guidelines to support compatibility of climate construction towards disaster risk reduction in the rural and urban communities. | 4.06 | 0.81 | 4.21 | 0.84 | 4.34 | 0.87 |
| 7 | DRM & DRR laws & regulations suggest flood model and methodology to reduce communities' vulnerability. | 3.99 | 0.80 | 4.01 | 0.80 | 4.10 | 0.82 |
| 8 | DRM & DRR encourages community disaster risk management committees supported by local government legislation or state house of assembly as collaboration to reduce flood impacts. | 4.01 | 0.80 | 4.16 | 0.83 | 2.72 | 0.54 |
| 9 | DRM & DRR policies support the preservation of flood data information as generated and dissemination of required information to the public to contribute to knowledge gears towards improving capacity and reduce flood impacts. | 4.06 | 0.81 | 4.09 | 0.82 | 4.30 | 0.86 |
| 10 | DRM & DRR policies create institutional opportunity to develop or adopt methodology to assess vulnerable zone of flood hazard. | 4.06 | 0.81 | 4.34 | 0.87 | 4.18 | 0.84 |
| 11 | Developing indices to assess vulnerability and collaboration with other institutions to manage flood hazard is part of DRM & DRR policy. | 3.75 | 0.75 | 4.00 | 0.80 | 3.94 | 0.79 |
| 12 | Consideration of people as first priority while assessing | 4.06 | 0.81 | 4.20 | 0.84 | 3.58 | 0.72 |

| | | | | | | | |
|--|--|-------------|-------------|-------------|-------------|-------------|-------------|
| 13 | vulnerability is highly advisable in DRM & DRR policy. DRM preparedness of community and implementation approach is a process to reduce flood hazard impacts. | 4.04 | 0.81 | 4.25 | 0.85 | 4.11 | 0.82 |
| 14 | Positive individual/community behavior actions as advised by DRM & DRR policies represent adaptation option in reducing vulnerability with regards to 2012 and 2018 flood disaster. | 4.03 | 0.81 | 4.08 | 0.82 | 3.81 | 0.76 |
| 15 | The implementation of insurance scheme as advised by DRM & DRR policies to reduce flood impacts on the people living in flood plain areas especially the affected communities of 2012 and 2018 flood events in Bayelsa, Delta and Rivers States is a necessary step to improve capacity. | 4.06 | 0.81 | 4.06 | 0.81 | 3.99 | 0.80 |
| 16 | Flood management institutions like NEMA, and other related supporting agencies plays vital roles on active preparedness plan as advised by DRM & DRR policies which aim to improve capacity, reduce vulnerability and flood impacts. | 3.97 | 0.79 | 3.98 | 0.80 | 3.47 | 0.69 |
| 17 | Awareness or early warning campaigns by government agencies or private sectors as advised by DRM & DRR policies help to activate the local community's adaptive capacities to disaster risk reduction. | 3.96 | 0.79 | 4.22 | 0.84 | 4.34 | 0.87 |
| 18 | Introducing flood hazard management into primary, secondary schools' curriculum & university institutions will help contribute to knowledge/capacities of Nigeria child. | 3.94 | 0.79 | 4.30 | 0.86 | 3.98 | 0.80 |
| 19 | Strategic funding by government at all level towards DRM preparedness/implementation will help build confidence of Nigeria child. | 3.87 | 0.77 | 4.15 | 0.83 | 4.06 | 0.81 |
| Grand Mean (\bar{X}) & Std | | 4.03 | 0.80 | 4.18 | 0.84 | 3.88 | 0.78 |

Source: Researcher's Fieldwork, 2021

Table 3.11 reveals the respondents' perception and knowledge on the provision of disaster action laws and policies with the overall grand mean of 4.03, 4.18 and 3.88 which is greater than the criterion mean (3.00).

IV. DISCUSSIONS OF FINDINGS

This study was aimed at assessing capacity and needs of residents affected by the flood events in the Niger Delta selected states. Its objectives were to examine the followings: To identify the categories of vulnerabilities to flood hazard, (physical, material, economic, social, organizational, political, attitudinal, & motivational) that best describes the situation of the study area, and identify the laws and policies which provide a formal basis for counter disaster action in the study states.

The hypotheses formulated were tested using Analysis of variance ANOVA. However, to give general description of the respondents on the issues raised, frequencies mean and simple percentage were used. The following are discussions arising from the major findings of the study.

Categories of vulnerabilities to flood hazard

The objective two of this study identify the categories of vulnerabilities to flood hazard, physical, material, economic, social, organizational, political, attitudinal, & motivational that best describes the situation of the study area. Responses were drawn from the respondents across the three sampled States to gauge their perception. There is no significant difference in the opinions of the respondents on this objective. The results in table 4.2 it indicates that the respondents from the sampled States agreed with items 1, 2, 3, 4, 5, 6, 8, 9 and 11 which show high level of vulnerability of the social, organizational and political aspect of life to flood hazards in the study area.

Further, table 3.10 indicates the mean and standard deviation of 4.17(0.83) for Bayelsa, 3.95(0.79) for Delta and 3.68(0.74) of the respondents across the study area agreed that the financial earning of households/family members/community population before flood events was fairly adequate. Respondents from the three States agreed that the occupation of the people like farming, daily market/shop sales, livestock/poultry, street sales, fishery were impacted negatively due to flood events thereby created low earning with the Bayelsa mean rating of 4.94(0.99), Delta 3.61(0.72) and Rivers 3.58(0.72) respectively.

Respondents from Delta and Rivers with the mean and standard deviation of 3.74(0.75) and 3.53(0.71) respectively agreed that Government created a resilience approach to resuscitate community-based occupation by providing financial grants, and several relief materials to facilitate earning of the affected population, while Bayelsa respondents with the mean rating of 2.02(0.40) disagreed. Respondents agreed that Flood impacts led to the decrease of community population earning with the mean rating of Bayelsa as 4.27(0.85), Delta 3.83(0.77) and Rivers 3.49(0.70).

Respondents across the study States agreed that land ownership in the flood affected communities is owned through inheritance, purchase etc. with the mean of 4.67(0.93) for Bayelsa respondents, 3.90(0.78) for Delta and 3.44(0.69). On damaged houses due to flood event was rebuild through self-savings, monthly salary

without government grant, soft loan or insurance scheme attracted a general agreement from the respondents with Bayelsa mean of 4.76(0.95), Delta 3.71(0.71) and Rivers 3.56(0.71). Further, item 7 which state that Startup of business after flood events like farming, livestock/poultry, small scale market etc. was made possible through government pay-back loan to those affected by 2012 and 2018 flood disaster attracted a general disagreement from respondents. From the result of the findings, it indicates that majority agreed with the items. It implies the level of Economic Vulnerability in the studied areas to flood hazards. Also, the findings equally showed that the respondents agreed that the Physical/Material Vulnerability to flood hazards was high which required urgent attention from government and NGOs respectively. In the opinion of Opondo (2013), Although some of these coping mechanisms may be successful in the short term, they could have severe implications at the long run-in terms of achieving livelihood sustainability in the area. This may be obvious when people are unable to recover from impacts of flood disaster.

Laws and policies which provide basis for counter disaster action in the study States.

The sixth objectives looked into the laws and policies which provide a formal basis for counter disaster action in the study states. The result shows that there is no significant difference in the opinions of the respondents on this question.

Table 3.11 reveals the respondents' perception and knowledge on the provision of disaster action laws and policies with the overall grand mean of 4.03, 4.18 and 3.88 which is greater than the criterion mean (3.00).

V. CONCLUSIONS

The research results discovered that floods events over the period experienced in the study area have had adverse impacts on the socio-economic status and livelihoods of the people of Niger-Delta with respect to the sampled States. It also agrees with the statement that flood impacts affects more people on an annual basis than any other natural disaster due to climate change in the study area. Flooding frequency and intensity is said to be on the increase every year within the seasonal periods. In terms of livelihood, the study discovered that the flood incident has devastated seriously the economy aspects of the rural communities starting from farming which is the major source of livelihood of the people. Farmlands were submerged and other agriculture produce were destroyed. The flood impacts also affected the environment by causing gully erosion in most areas. In line with capacity advancement the rural people were able to devise mean of coping abilities to help mitigate future disaster occurrence by means of relocating out of the flood plain, reconstruction of houses with reinforced materials, raising of houses above flood plains, creation of water channels for flood water evacuation, frequent removal of sand from blocked drainages, building of dikes using sand bags and fumigation of stagnant flood water. Regrettably, these coping mechanisms are considered not sustainable in the long-term basis.

Recommendation of the study

In light of the findings of the study, the researcher recommends that: -

1. There is need to improve on capacity building such as training, advocacy on flood disaster management practices, community preparedness, engaging community leaderships to accept proactive responsibilities that will enhance down-top and up-top communication pattern towards equipping the local people, improve awareness of safety measures, early warning, skill enhancement to improve local knowledge. Provision of financial resources and human resources to enhance early preparedness aim to improve resilience of the people, improvement on critical infrastructures, creating education for all opportunities, and all sectors business advancement of the local people affected by flood events.
2. Repair and construction of new drainages and construction of flood diversion channels which involves the construction of artificial channels along main river channels to evacuate excess water during floods.
3. Governmental and Non-Governmental organizations to assist in enlightenment campaign and dissemination of early warning to the local communities.
4. Adequate medical facilities should be provided for the treatment of various environmental diseases resulting from flood.
5. The construction of houses using durable materials for the flood victims and away from the flood prone areas should be considered. Community based coping strategies should be incorporated for strengthening the mitigation measures.
6. Relocation to a higher ground is a necessary condition. Also, there should be a deliberate policy to compel communities especially in rural areas to build house using durable materials and away from the flood prone areas.

Contributions to Knowledge

The research has established the level of vulnerability of the people and its environs to flood hazards. There is an established pattern of behavior driven by their tradition especially among the sampled communities in the study States.

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