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Community Resilience Assessment of Cohesion and Connectedness, Leadership, Response and Preparedness to Flooding among Coastal Communities in South-South, Nigeria

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Abstract
The study examined the community cohesion and connectedness, leadership and response to flooding among coastal communities in South-south Nigeria. The study made use of 400 copies of questionnaire to elicit information on the data on demographic and socio-economic characteristics; data on levels of social vulnerability in terms of exposure, susceptibility and adaptive capacity of the households to flood. The study employed the multistage sampling technique involving purposive, simple random and systematic sampling techniques. Descriptive statistics were employed for the data analysis. Also, inferential statistics involving principal component analysis (PCA) were employed to test hypotheses. Findings showed that community collectiveness in problem solving, knowledge of problem solving, social cohesion/cooperation and hopeful futuristic plan as the four principal components or variables of community cohesion and connectedness in flood management (Component Loadings=±≥0.8). Findings also showed that the unwillingness of a good percentage of the people across the selected communities of becoming leaders in their respective communities. The second ranked item showed that 61.6% of the people across the selected states stated that leadership opportunities are available to people who live in the community. The third ranked item showed that 71% of the people alleged that leaders in their respective communities are effective and are able to provide emergency services during a flood disaster. Results also showed that ccommunity response and preparedness in flood management is largely controlled experience of community in flood risk management (0.865) and active preparedness of community for future disasters (0.834). It can be concluded that the devastating impact of flood can be managed when with effective leadership and community cohesion in the coastal areas. Based on the research findings the study recommended among others that the community should be encouraged to come up with measure to increase their adaptive capacity to flood. The establishment of effective leadership at the community level is imperative in food mitigation.
Keywords: Community, Cohesion, Connectedness, Leadership, Flooding, Response, Coastal communities
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1. Introduction

All over the world, communities mostly those along the coast are vulnerable to extreme weather condition. One of such weather condition that has become a recurrent issue among coastal communities is flooding. Flood is a serious environmental issue that has caused damage to lives and properties of households in coastal environment. The severity of flood events varies across communities as a result of variation in community cohesion and connectedness, leadership and response to flood as well as socioeconomic factors. Communities where government takes flood seriously and is able to put in place flood mitigation measures are able to cope with flood compared to communities where such measures and actions are not carried out by the government. The phenomenon of climate change and its associated weather extremes have made vulnerability and resilience fundamental front burner issues in environmental debates. The degree to which people are affected by a hazard does not lie in the physical and environmental components only, but also on the social and economic dimensions (Nkwunonwu, 2017). Apart from socioeconomic factors, social cohesion and effective leadership among households in coastal areas can have a substantial impact on their fight and preparedness toward flood and it explains the variation in social vulnerability among coastal communities.

Appraising social vulnerability has been an issue of concern in recent risk and disaster management studies (Rufat et al., 2015). Lawal and Arokoyu (2015) stated that social vulnerability is simply the societal attributes which have adverse impacts on disaster outcomes. This indeed has diverse dimensional effects on environmental problems. For instance, coastal communities with adequate cooperation and good understanding of their environmental problems are able to unite in decision making and devise a better way or measure in flood management. They are able to make financial contribution to put in place effective structural measures of flood

management. Studies carried out by Adelekan (2015) among several others have shown the roles social cohesion and effective leadership in flood management. These factors in association with socioeconomic characteristics play substantial impact on the spatial variability in social vulnerability among coastal communities (Rufat et al., 2015). Social cohesion and effective leadership as well as economic characteristics are essential in enhancing the fight against flooding.

If people in a community come together and share or have similar ideology in solving environmental problems, they will be able to put under control any visible and future perceived environmental problems that could be devastating to their lives. Their collective effort will enable them contribute their resources to procure boulders to protect their environment from storm surges as well as put in place adequate measures of flood mitigation. Knowledge of environmental problems and their sources is an essential pathway to successful management. If a community knows the cause of their problems and put in place necessary measures and actions to prevent them, they will be free from the aftermath effects. For instance, if people in a community agree to keep water channels clean and make sure they are cleared of wastes, they will be able to manage the devastating effects of flooding. Therefore, community knowledge of problem solving goes a long way in reducing the devastating and ravaging effects of flooding and also helps to reduce the frequency of flooding. Vulnerability is not confined to poverty, but existing studies have shown that the poor tend to suffer worst from disasters (UNISDR, 2004).

Vulnerability assessment is increasingly considered as an approach in understanding the extent of exposure, extent of susceptibility and level of adaptive capacities of coastal communities to environmental problems (Birkmann, 2006). The ability of coastal communities to remain resilient to hazards is rooted in understanding their potential exposure and vulnerabilities. It is therefore imperative to understand the social vulnerability of different coastal communities in the Niger Delta to flooding and identify the factor (s) that account for the variation in the level of exposure, susceptibility and adaptation to flooding. Such vital information enables the appropriate flood mitigation measure and assistance to be put in place by government and individuals in the community to manage the devastating impact of flood and increase community resilience. With evidence of variation in flood incidence across communities and states in the Niger Delta, it is important to give vital information on how community cohesion and connectedness, leadership and response impact on the social vulnerability of coastal communities liable to flood disasters. Many works have been done on community cohesion, connectedness and response to flood but very few had been done in the Niger Delta Region in which South-south Geopolitical Zone is inclusive. Thus, the present study assessed the community cohesion, connectedness, leadership and response to flooding among the coastal communities in South-south Nigeria with a view to suggesting possible ways to improve on the adaptive capacity of coastal communities to flood.

2. Materials and methods

Study area

The study area comprises households in Rivers, Delta and Bayelsa States. These states are located in the South–south region of Nigeria (Figure 1). The entire South-south comprises Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States with a total spatial extent of 84,643 km^2. The South-south region of Nigeria is the second largest delta in the world with a coastline which spans about 450 kilometres and of course the richest wetland in the world (Awosika et al., 1995). The region is divided into four ecological zones namely coastal inland zone, mangrove swamp zone, freshwater zone and lowland rain forest zone (Awosika et al., 1995). The region is influenced by the localized convection of the West African monsoon with less contribution from the mesoscale and synoptic system of the Sahel. The monsoon rainy (wet) season over the area begins in May, as result of the seasonal northward movement of the Inter-Tropical Convergence Zone (ITCZ), with cessation in October. Fishing and agriculture are the two major traditional occupations of the Niger Delta peoples.

Types and sources of data

Primary data were basically used. Primary data were collected through the administration of questionnaire copies to households in coastal areas across the selected states. The data collected include: data on demographic and socio-economic characteristics; data on levels of social vulnerability in terms of exposure, susceptibility and adaptive capacity of the households to flood. These data were categorical variables that show of how households across the selected States are exposed to flood, susceptible to flood and whether or not they have the adaptive capacity to cope with flood.

Sampling techniques

The study employed the multistage sampling technique involving three steps. The steps involved the interplay of purposive, simple random and systematic sampling technique. In the first step, purposive sampling technique was employed to select basically States in the south-southern region seriously affected by the 2012 and 2018 floods and the affected States were Rivers, Bayelsa, Delta and Edo States. The justification for the selection of

these states (Rivers, Bayelsa, Delta and Edo) is that they were declared national disaster states on the account of flood by the NEMA in 2012 and 2018. More so, the States experience annual constant flooding. In the second step, simple random sampling technique was then used to select three states out of the four; the three randomly selected states were Rivers, Delta and Bayelsa States. In the third step, systematic sampling technique was employed during questionnaire administration. This technique enabled copies of structure questionnaire to be successfully administered to households in the selected States. This technique was chosen and employed due to the poor arrangement and numbering of houses in the coastal areas. As such, in each chosen street, the second building was chosen for questionnaire administration after which the fourth was picked in that manner. The interval between each surveyed household was three. Also, only one household head (male or female) was selected for the survey.

Sample size

In order to sample or survey a representative of the population across the selected states, the sample size was determined using Yamane's formula (1967). The Yamane, Taro's formula is as follows:

$$n = \frac{N}{1+N(e)^2} \quad \text{.....} \quad \text{eqn(1)}$$

Where: n = sample size; N = Definite population of coastal communities in the selected states; e = level of precision or confidence level $(0.05)^2$

$$n = \frac{1{,}768{,}487}{1+1{,}768{,}487 \times (0.05)^2}$$

$$= \frac{1{,}768{,}487}{1+1{,}768{,}487 \times 0.0025}$$

$$\frac{1{,}768{,}487}{1+4421.22}$$

$$= \frac{1{,}768{,}487}{4422.22}$$

$$= 399.9$$

$$= 399.99$$

$$n \approx 400$$

Since the sample size is 400 for the vulnerable, frontline and coastal LGAs across the three States (Bayelsa, Rivers and Delta). But from field observation and experiences, not all questionnaire administered in the field would be retrieved back from the respondents and more so, some questionnaire may not be responded to. Therefore, the sample size was increased by multiplying the obtained figure by 2. The essence was to accommodate for these lapses. Hence, $n = 2 \times 400 = 800$. The number of questionnaire copies administered to communities under States is shown in Table 1.

Table 1: Sample size for LGAs, their projected and household population

States	Name of LGA	Projected Population to 2018	Household Population per LGA	Number of Questionnaire per LGA
Bayelsa	Ekeremor	379,914	63,319	29
	Brass	259,479	4,246	20
	Kolokum/Opukuma	111,705	18,617	8
	Nembe	184,562	30,760	14
	Ogbia	25,108	42,185	19
	Sagbama	263,343	43,890	20
Rivers	Abua/Odual	421,819	70,303	32
	Ahoada East	248,428	41,404	19
	Ahoda West	37,226	62,044	28
	Andoni	325,500	54,250	25
	Asari - Toru	328,283	54,714	25
	Bonny	321,108	53,518	24
	Degama	372,614	62,102	28
	Eleme	284,081	47,346	21
	Emuoha	300,307	50,051	23
	Khana	437,524	72,921	33

States	Name of LGA	Projected Population to 2018	Household Population per LGA	Number of Questionnaire per LGA
	Obio/Akpor	690,585	115,097	52
	Opobo/Nkoro	228,278	38,046	17
	Tai	179,697	29,949	14
Delta	Bomadi	125,527	20,921	9
	Burutu	303,509	50,585	23
	Ethiope East	293,243	48,874	22
	Ethiope West	295,826	49,304	22
	Isoko North	209,501	34,917	16
	Isoko South	343,159	57,193	26
	Ndokwa East	150,639	25,106	11
	Ndokwa West	218,936	36,489	17
	Okpe	187,376	31,229	14
	Oshimili North	172,990	28,831	13
	Oshimili South	218,948	36,491	17
	Patani	98,346	16,391	7
	Sapele	254,323	42,387	19
	Ughelli North	467,991	77,999	35
	Ughelli South	310,311	51,719	23
	Ukwuani	173,711	28,951	13
	Warri North	198,688	33,115	15
	Warri South	455,270	75,878	34
	Warri South-West	170,069	28,345	13
		10,047,924	**1,729,487**	**800**

Source: National Population Commission (2006)

Methods of data collection

Structured questionnaire copies were personally administered to the target population with the help of seven trained field assistants. After the purpose of the survey had been explained to the respective respondents and consent for the survey was given, copies of questionnaire were administered to the respondents. To avoid questionnaire loss, respondents were convinced to instantly respond to the questions. For quality assurance, the completed and returned copies of the questionnaire were carefully preserved to avoid loss and destruction. After questionnaire administration, out of the 800 copies administered, 653 copies were retrieved and out of this number, 632 copies were successfully collected and used for the analysis. Other copies were voided for double entries.

Methods of data analysis

Data obtained from the administered questionnaire were analyzed using simple percentages, and logistic regression analysis. Data transformation into dummies of 1 and 0 was carried out on some items to make them data appropriate for the application parametric test (Alkharusi, 2012; Deinne and Ajayi, 2017) such as Principal Component Analysis. Therefore, positive responses were assigned the value 1, and negative 0. For instance, education was recoded into primary/secondary school as 1 and otherwise as 0; occupation was recoded into working (employed) as 1 and otherwise as 0 and so on. Also, items measured on Likert Scale with responses ranging from strong agree to strong disagree were recoded into dummies of 1 for Agree and 0 for disagree. Thus, responses of strongly agree and agree were taken as 1, and others as 0 (strongly disagree and disagree). Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) Version (22.0) for Windows and excel spreadsheet.

3. Results and Discussions

Assessment of community cohesion and connectedness in disaster flood management

The perception of households on the extent of community cohesion and connectedness to flood management and resilience was determined using principal components analysis (PCA). The result obtained is shown in Table 1. Using component loadings ±≥0.8, PC_1 had strong and positive loading on only one variable *I work with people in my community to solve our problems* (0.829). PC_1 was responsible for 25.0 percent of total variance in community cohesion and connectedness data set. Based on the variable that loaded on PC_1, it therefore represented community collectiveness in problem solving. PC_2 had only one variable that loaded on it; the variable was *People in my community know where to go to get things done* (0.809). PC_2 was responsible for 14.2

percent of the total variance in the variable set and symbolized knowledge of problem solving. Similarly, PC_3 had a variable that positively loaded on it; the variable was *there is social cohesion and network cooperation in my community* (0.812). PC_3 was accountable for 12.1 percent of the total variance in the variable set and represented social cooperation. Lastly, PC_4 had a variable that loaded on it; the variable was *People in my community have hope about the future* (0.814). PC_4 explained 8.6 percent of the total variance in the variable set and symbolized hopeful futuristic plan. The respective components presented in Table 1 identifies community collectiveness in problem solving, knowledge of problem solving, social cohesion/cooperation and hopeful futuristic plan as the four principal components or variables of community cohesion and connectedness in flood management.

These identified factors to a large extent explain the level of community cohesion and connectedness which can have substantial impact on flood control. The first extracted component shows the importance of community collectiveness in flood disaster management and problem solving. This is essential in enhancing the fight against flooding. If people in a community come together and share or have similar ideology in solving environmental problems, they will be able to put under control any visible and future perceived environmental problems that could be devastating to their lives. In flood prone areas, if households come together to put in place measures (like sand bags) to prevent floods, the risks associated with flooding will be minimized or put into absolute control. Their collective effort will enable them contribute their resources to procure boulders to protect their environment from storm surges as well as put in place adequate measures of flood mitigation. This agrees with the position of Adelekan (2016) where community collective efforts (through levies) enable households along flood prone areas to adequately develop the adaptive capacity to flood. However, a look at the response rate for this item showed that it is only in Rivers State that majority (68.6%) of the households come together in solving environmental problems. In Delta State, there is evidence of low community effort in problem solving (23.1%) and same applies to Bayelsa State with only 48.4% involved in community collective effort in environmental management. In all, the result explains the benefit of community collectiveness in flood disaster management.

Knowledge of problem solving is another principal factor that defines community cohesion and connectedness in flood disaster management. Knowledge of environmental problems and their sources is an essential pathway to successful management. This is because it enables flood maps in terms of mental maps of vulnerable areas to be identified and possible actions taken to address flood risks. If a community know the cause of their problems and put in place necessary measures and actions to prevent them, they will be free from the aftermath effects. In relation to flood, if communities across the selected states come together and decide that nobody builds on high flood prone areas and go ahead to protect those areas, flooding could be control or the risks associated with it reduced. Also, if people agree to keep water channels clean and make sure they are cleared of wastes, they will be able to manage the devastating effects of flooding. Therefore, community knowledge of problem solving goes a long way in reducing the devastating and ravaging effects of flooding and also helps to reduce the frequency of flooding. Having knowledge of the root cause of flooding and coming together to manage the observed problems is an absolute panacea for flood management. The assertions made above lend support to those of World Meteorological Organization (2017) where it is reported that flood hazard and vulnerability mapping is an effective tool for gathering and sharing information for the purposes of preparedness and raising awareness. Based on the plausible flood or historical flood data (thus valorizing popular knowledge, such as that of elders or, more generally, indigenous knowledge as a whole), people can identify (remember) flooded areas, effective evacuation routes and the actions necessary to prepare for floods with the help of the risk assessment. However, the response rate on the item showed that 65.4%, 82.3% and 63.2% of the people in Rivers, Delta and Bayelsa States respectively do not know what to do to get things done. This implies the lack of knowledge in problem solving which could explain the reason behind the continuous flood incidence in these states.

Social cohesion/cooperation is the third principal factor that defines community cohesion and connectedness in flood disaster management. In line with this, Townshend et al., (2015) stated that social cohesion has been recognised as a protective factor that confers some resilience upon communities. As already explained above, if a community comes together to chart a common goal, they attain success. A united community is able to work in one accord and voice in managing environmental problems. The community will be able to network in getting assistance from government and private individuals in enhancing flood disaster management. They will be able to gather resources from wealthy people within and outside their immediate community which enables them to adequately put in place measures to prevent flood disasters. In a related study, Chang (2010) stated that community unity and cooperation enable residents to come together to cope with their losses as well as confront floods. The study further stated that cohesion increases in line with hazard severity at the initial flood stage, as residents recognized the importance of community unity. Also, Patel and Gleason (2018) reported that social cohesion to be positively associated with resilience and when ahead to state that social cohesion has the greatest impact on the community resilience. The response rate across the selected states on this item showed the existence of social cohesion and network cooperation across the selected states with responses

of 59.2%, 43.1% and 49.4% respectively in Rivers, Delta and Bayelsa States. It could therefore be argued that social cooperation in the fight against flood is well established among households in Rivers State than in the other states. The responses obtained across the states go to show that people in the area to some extent come together in one way or the other in solving flood associated problems.

Hopeful futuristic plan is the fourth principal factor that defines community cohesion and connectedness in flood disaster management. When a community has a futuristic plan and tries as much as possible to actualise it, they will be able to confront flooding and its associated impacts. Having hope about the future mostly in flood management is dependent on the measures, policies and social cooperation and networking already in existence in flood and other environmental management. The response rate at the community level showed that majority (over 55%) of the households across the selected states expressed hope about the future in flood management. This goes to show that households across the communities studied are ready to take active participation in flood disaster risk management and as such are hopeful of surmounting risks associated with flooding. The result in Table 4.11 therefore identifies community collectiveness in problem solving, knowledge of problem solving, social cooperation/cohesion and hopeful futuristic plan as the four main variables of community cohesion and connectedness in flood management. These identified variables improve community resilience by providing the ability of an area or neighbourhood to respond and manage flood risks through collective action until formal infrastructure and institutions are restored (Banwell and Kingham, 2015; Magis, 2010).

Table 1: PCA Result of community cohesion and connectedness in flood management[a]

Variables	Components			
	PC_1	**PC_2**	**PC_3**	**PC_4**
I have friends in my community.	0.797	0.071	0.178	0.211
I work with people in my community to solve our problems.	0.829	0.159	0.113	-0.003
I feel like I belong to my community.	0.791	0.067	-0.005	0.197
My community treats people fairly no matter what their background is.	0.728	0.177	0.319	0.044
My community cooperate effectively during flood disaster in the community	0.703	0.217	0.143	0.067
People in my community help each other.	0.691	0.089	0.402	0.094
People in my community feel like they belong to the community.	0.541	-0.020	0.507	0.218
My community supports programs for children and families.	0.508	0.319	0.470	-0.030
People in my community know what to do to get things done.	0.054	0.809	-0.006	0.172
People in my community are able to get the services they need.	0.068	0.738	0.054	0.175
I can get the services I need.	0.178	0.664	0.061	0.099
My community works with organizations and agencies outside the community to get things done.	0.362	0.597	0.121	-0.173
There is a place where my community can seek for shelter during and after flood	0.020	0.553	0.119	0.309
People in my community trust public officials.	0.035	0.435	0.379	0.029
There is social cohesion and network cooperation in my community	0.096	0.214	0.812	-.029
People in my community are committed to the well-being of the community.	0.483	0.002	0.627	0.166
I would get involved in trying to improve my community.	0.505	0.005	0.588	0.208
People in my community have hope about the future.	0.069	0.195	0.026	0.814
I have hope about the future.	0.543	0.095	0.019	0.609
My community get help from friends and commune-members in case of flood	0.168	0.294	0.175	0.523
Eigenvalues	**5.0**	**2.85**	**2.41**	**1.72**
% variance	**24.99**	**14.23**	**12.07**	**8.61**
Cumulative exp.	**24.99**	**39.22**	**51.3**	**60.01**

[a]the underlined with coefficients ±≥0.8 are considered significant
Source: Researcher's fieldwork (2020)

Community leadership and governance in flood management

The results in Table 2 revealed that the first ranked item expressed the unwillingness of a good percentage of the people across the selected communities of becoming leaders in their respective communities. This goes to show that a majority number of households in the flood prone areas do not want to lead in flood management; they just want to be members in enhancing community leadership and governance. The negative attitude of people towards leadership position could be attributed to their economic status which could limit them from acting efficiently. This is expected as being a leader mostly in flood prone areas demands a lot in making sure

appropriate measures are put in place to confront the risk associated with flooding. In addition, many who opt out of leadership role feel they do not have the charisma (leadership qualities) to lead and as such will not want to push for it. The result obtained clearly shows that a good number of the people in the selected states do not want to become leader. However, the percentage of people willing to lead is commendable and indicates that community leadership and governance in flood management to a large extent is not a challenging problem.

The second ranked item showed that 61.6% of the people across the selected states stated that leadership opportunities are available to people who live in the community. This is expected as only people who live in the area have adequate knowledge of the environmental problems therein and understand the economic status of households in the area. Such people if become leaders will be able to work with residents because he/she has a good knowledge of the area and ways to approach them in contributing collectively for flood management. In addition, residents of the area are able to communicate freely with the people in the language the all understand; this makes it easier for such leaders to have high participation from the people. Also, since people of the area know their leaders and they are closer to them, they will develop positive attitude towards governance which by extension foster adequate flood management. The assertions above lend support to the finding of Atanga (2019) stated that an effective flood risk management strategy making and implementation require active participation of flood prone community leaders.

The third ranked item showed that 71% of the people alleged that leaders in their respective communities are effective and are able to provide emergency services during a flood disaster. This goes to show that leaders in the selected states are always looking for solutions in managing flood and this is portrayed in the assistance rendered to households during flood event. They make sure lives are not lost and liaise with the youth and eminent personalities in providing relief materials to households ravaged by flood disaster. They also provide temporary shelter to households heavily devastated and displaced by flood disaster. During flooding, the leaders make sure succor is provided to households since their source of income and economic activities are usually grounded during flood disaster. The result goes to show that leaders across the selected states are proactive in providing assistance to households during flood disaster. The result in Table 2 therefore identifies unwillingness to become leaders, indigenous leadership and effective leadership as the main community resources, leadership and governance that interplay in flood management. These three attributes of leadership need to positively interplay to ensure an effective mechanism for flood risk management. In a related study, Atanga (2019) stated that an effective flood risk management strategy making, and implementation require active participation of flood prone community leaders. In line with this, Iyi and Ugwuanyi (2014) stated that community or citizen participation and leadership is an involvement of all stakeholders in the totality of society activities. It is an approach that best embraces the calls for bottom-up approach to matters pertaining to handling environmental issues.

Table 2: Households' perception on community leadership and governance

Items	Total % response		Chi square	Mean	Rank
	A	D			
I would like to become a leader in my community.	36.1	53.7	190.53*	3.28	1
Leadership opportunities are available to people who live in my community.	31.3	61.6	239.12*	3.22	2
My community has effective leaders and can provide emergency services during a flood disaster.	21.8	71.0	445.58*	2.90	3

*Significant at 5%; p-Value is 0.000; df = 4; the remaining percentage represents undecided

Community response and preparedness in flood management

The discernment of households on community response and preparedness in flood management is presented in Table 3. The result revealed that PC_1 had strong and positive loading on only one variable *My community is experienced in flood risk management* (0.865). PC_1 was responsible for 30.9 percent of total variance in community goals, vision, and response and preparedness data set. PC_1 symbolized community knowledge in flood management. PC_2 also had only one variable that loaded on it; the variable was *My community actively prepares for future disasters* (0.834). PC_2 was responsible for 26.4 percent of the total variance in the variable set and symbolized community preparedness in flood management. The extracted components presented in Table 3 identify community knowledge in flood management and community preparedness in flood management as the two principal components or variables of community goals, vision, response and preparedness in flood management. These two factors to a large extent explain the level of community goals, vision, response and preparedness which can have considerable impact on flood management.

The first extracted component shows the importance of community knowledge in flood management. This is fundamental and indeed the first step in sustainable flood management. Having knowledge on the right

measure to take or put in place to a large extent helps in mitigating the risks associated with flooding. It also helps in managing flood risks before the arrival of external assistance. History or antecedents of floods in an area enable people in the said area to know (based on local knowledge over time) the measures to put in place to reduce the devastating impacts of flood. For instance, using superior building materials and increasing the height of houses some meters above the ground can reduce the impact of flood as well as putting in place measures to facilitate movement during flood is another aspect of community knowledge in dealing with flood incidence. One obvious measure often used is the use of banana-tree trunk raft to make commuting possible (Di Baldassarre, 2010). This approach is employed among poor households. Across the selected states, poor and vulnerable populations have devised a creative set of strategies and complex adjustments that have allowed them to live in hazard-prone areas. The local knowledge of flood over time has helped them to prepare and manage crises caused by flooding among other natural hazards. In a related study, Ali et al (2017) and Kleinen, (2007) stated that local knowledge or community knowledge is an inherent part of community resilience and capacity and is a basis for local coping strategies. Through application of local knowledge, communities are able to help themselves in the absence of and prior to the arrival of external parties. Local knowledge according to Maciag (2018) is especially valuable for communities exposed to recurrent flooding, who have developed culturally embedded knowledge on how to live with floods over many generations.

The second extracted component echoes the importance of community preparedness in flood management. In order to adequately reduce the risks associated with flooding, the community must be prepared for flood and if well prepared, it will be able to either contend it without any impact or reduce the widespread impact of flooding. For instance, the use of sandbags has been one of the measures put in place mostly by poor households to reduce widespread flooding. The sandbags help to reduce the spread of flooded water which by implication reduces the devastating impacts of flood. Flood walls, hydraulic structures and bank revetment as well as spur/groyne are other structure measured in flood preparedness. These latter measures are cost intensive as such are hardly used by people in flood prone areas except through government's intervention. A look at the response rate on this item of the questionnaire showed the absence of flood preparedness; this is affirmed by that majority (76.9%) of the households across the selected states that their communities do not actively prepare for future disasters. This implies poor flood management measure which could result in enormous loss of lives and properties including loss of animals. The lack of preparedness could be likened to the absence of early warning system that enables households and the community at large to fully prepare for flood. Similar reason for lack of flood preparedness was given by Adejuwon and Aina (2014) when they reported flood affected communities in Ibadan, Nigeria were not effectively informed to enable them prepare for the flood disaster by emergency agencies due to financial constraints and ineffective communication system. According to Abdulmajid (2020), flood preparedness plan (FPP) enables households to put in place a set of appropriate arrangements in advance for an effective response to floods. This perhaps is an essential phase of flood disaster management which is seriously neglected in the study locations. The result in Table 3 therefore identifies community knowledge and community preparedness in flood management as the two principal components or variables of community goals, vision, response and preparedness in flood management. These identified variables facilitate community resilience and explain how communities use local knowledge to adequately prepare for flood which in the long-run greatly reduces the risks associated with flood.

Table 3: PCA on community response and preparedness in flood management[a]

Variables	Components	
	PC_1	**PC_2**
My community is experienced in flood risk management	0.865	0.174
My community is prepared for flood and trust public officials	0.764	0.101
My community has services and programs to help people after flood disaster.	0.733	0.246
My community has services and programs to help people after disaster.	0.716	0.277
My family and I have a disaster plan.	0.594	0.439
My community can provide emergency services during disaster.	0.570	0.461
My community get a flood warning message/forecast	0.492	0.365
My community actively prepares for future disasters.	0.198	0.834
My community tries to prevent disasters & actively prepares for future disaster.	0.270	0.774
My community has priorities and sets goals for the future.	0.357	0.676
My family is able to evacuate, in case of a flood disaster	0.132	0.658
Eigenvalues	**3.4**	**2.9**
% variance	**30.87**	**26.38**
Cumulative exp.	**30.87**	**57.25**

[a]the underlined with coefficients ±≥0.8 are considered significant

4. Conclusion and Recommendations

The study has clearly shown that community cohesion and connectedness, leadership and response play vital roles in flood mitigation, management and resilience. It clearly shows that the devastating impact of flood can be managed when with effective leadership and community cohesion in the coastal areas. These factors increase the adaptive capacity of coastal communities to flood because they are able reduce susceptibility level through the provision of flood mitigation measures. These identified factors to a large extent explain the level of community cohesion and connectedness which could have substantial impact on flood control. In effective flood control, community participation and knowledge of the intrinsic cause of flooding are essential components that determine how well communities are able to mitigate the devastating impacts of floods. The study further reveals that community knowledge in flood management and community preparedness in flood management are two basic attributes of community goals, vision, response and preparedness in flood management. This is expected as for a community to be able to adequately prepare and mitigate the consequences of floods; it must first have basic knowledge of flood management. Knowledge of flood management enables the community to know the exact flood preventive measure to put in place and with this knowledge; they are able to prepare for flood management. Based on the research findings the study suggests that the community should be encouraged to come up with measure to increase their adaptive capacity to flood. The establishment of effective leadership at the community level is imperative in food mitigation. This can be achieved through household participation in flood control (financial contribution and manual labour). Such participation need to be put in place and encouraged. Community participation enables adequate flood control measures to be put in place to increase the adaptive capacity of household to flooding. This approach enables communities to manage flood impacts without necessarily relying on the government.

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