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# Livelihood Devastation and the Most Vulnerable Group During Flooding in Southern Ijaw Local Government Area, Bayelsa State, Nigeria

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**Abstract:** Flooding accounts for several natural disasters and deaths world-wide. Millions of people are exposed to floods yearly. In Nigeria, amidst several natural disasters, flooding is the most common. Climate change induced rise in sea level have increased the frequency and intensity of floods in the world. In Nigeria, the severe floods of 2012, 2018 and 2022 are typical examples. The study explored livelihood devastation and the most vulnerable group during flooding in Southern Ijaw Local Government of Bayelsa State, Nigeria. Data were obtained using both primary and secondary sources. Cluster and simple random sampling techniques were adopted. The data analysis of the study revealed that women are the most vulnerable group during flooding in the study area. The study also identified that flooding has severe impact on livelihood, leading to the destruction of crops and fishes. It was thus recommended that challenges of vulnerable groups such as women and children should be addressed with priority during flood and post flood periods to enhance their capacities within the communities. Also, various subordinating rules against women in the communities, such as land rights should be investigated and stopped by the government. Government and relevant flood management agencies should provide proper social welfare for flood victims to cushion the effects of flooding. Those who are affected should be properly rehabilitated and provided with adequate relief materials.

**Keywords:** Climate Change, Flooding, Livelihood Devastation, Vulnerable Group

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## 1. Introduction

Flooding is among the major climatic natural disasters and hazards that threatens humanity. It is the most common hydro meteorological hazards. Flooding entails when a hitherto unsubmerged land gets submerged due to an overflow of a massive body of water [1]. Floods of various types and proportions leads to massive destruction of infrastructure and livelihoods. Human actions are key elements in the causes of flooding. Thus, strong control on the erection of developments on identifiable areas that are flood plains or flood prone is necessary [2]. Flooding causes massive destruction to biotic and abiotic resources in the environment [3].

Occurrences of floods is a challenge to the nation. The Nigerian economy had severally lost resources due to flooding, particularly in 2012, 2018 and 2022. This is in

addition to the social, political, and psychological cost of flooding on communities. Flooding impacts and destroys fish farms, crops, and farmlands. It as well leads to massive pollution of waters, destroying fishes and other aquatic lives [4]. Flooding also destroys economic lives of humans, particularly among rural dwellers due to the destruction of livelihoods [5]. The impact of flooding on farmlands in Niger state, Nigeria affects livelihoods of persons who habit the areas [6]. Flooding is also known to impacting critical areas such as agriculture, rivers, water, and land transportation in Oleh, Delta state, Nigeria [7]. In Nigeria, flooding is a perennial environmental problem that destroys livelihoods and diverse life sustaining activities in the society [8]. Floods are outcomes of rainfall, melting ice, etc. While flooding is mostly caused by rainfall, terrain is an insignificant cause [9]. Apart from the disruption of livelihood activities, flooding also disrupts socio - cultural activities of people [10]. High

levels of precipitation are the major natural cause of flooding, occasioned by climate change [11]. The neglect of the link between food security and sustainable development goals by policymakers is a major source of flooding [12]. Flooding is intense in Nigeria due to lack of global best mitigation practices [13]. Anthropogenic causes trigger flooding in both Nigeria and Ghana but can be mitigated through risk-management methods and facilities planning [14]. Following the exploration of flood occurrences, mapping and modelling approaches, the Bayesian and machine learning approaches are the best options for flood mapping and modelling in Nigeria [15]. Enhancing the capacities of relevant agencies, including communities to mitigate flood hazards in Nigeria is required [16]. Disaster management by the various disaster management teams in the country are fragmented or not coordinated, leading to inadequate remediation services. Government should ensure the coordination of these agencies and, use donor agencies to help re-settle flood victims in communities [17]. Recovery efforts during the 2012 and 2018 flood disasters in Nigeria were poor leading to theft, diversion of relief materials and inadequate provision of temporary shelters [18]. Emergency Management Agencies in the country do not show proactiveness in disaster management [19].

Nigeria experienced one of its largest floods in a century in 2012 [20]. The floods of 2012 and 2018 were massive. The 2022 flood had been the worst in Nigeria. Its intensity far surpassed the flood of 2012 [21]. The severity of the 2022 flood damaged food crops and properties, leading to increase in food prices in Bayelsa state [22]. Generally, flooding creates vulnerability, determined by environmental, economic, social, and physical processes, which increases the defenselessness of a locality to the effect of hazard. Vulnerability also dwells on entities at risk, implying extent of humans or locations at risk of flooding or possible entities to be affected by flooding. All groups are not equally vulnerable to floods, that some groups are more vulnerable due to peculiar circumstances [23]. Conditions of vulnerability are caused by several factors, e.g. poor living conditions, lack of power, etc. And that the vulnerability of men and women to disaster based on capacities and options differ. Women are often more vulnerable to disasters than men. Women have valuable knowledge and experience in coping with disasters. This fact is often ignored in policy decisions that ignore women's needs and their potential to assist in mitigation and relief work [24]. Women carry out 70% to 80% of agricultural work in Nigeria [25]. They are more into farming in Warri South Local Government of Delta state in Nigeria than men [26]. Women constitute 60 to 80 percent of those that are engaged in agricultural work and are 90 percent responsible for caring for children and the aged in the Niger Delta rural communities [27].

## 2. Study Area

Southern Ijaw Local Government Area is in Bayelsa state,

Niger Delta region, south-south geo-political zone of Nigeria. With a population of 479,000, projected from 2006 to 2022 at 2.5% annual population change, the headquarter is Oporoma in the North of the area at  $4^{\circ} 48' 17''$  N  $6^{\circ} 04' 44''$  E. While the spoken dialect of the people is Izon, they belong to the Ijaw tribe. The Local Government Area comprises of seven clans. Southern Ijaw LGA stretches across the bank of river Nun, Sagbama and Egbedi creeks including Apoi creek towards the south-western part of the Local Government Area leading to the Atlantic Ocean. The LGA is mainly riverine with few upland communities.

They are predominantly Fishers and farmers. Crops such as plantain, cassava, etc. are common. Other economic activities include canoe carving, lumbering, distillation of local gin etc.



**Figure 1.** Flooding in Ogboin Clan, Southern Ijaw Local Government Area, Bayelsa State, Nigeria.

## 3. Methodology

A cross-sectional research design was used in the study. Data were obtained using both primary and secondary sources. Cluster sampling technique was used to cluster the freshwater communities into five clans: Boma, Olodiama, Ogboin, Oporoma and Tarakiri clans. Apoi/Bassan and Koluma clans were purposely excluded as most communities in this clans are located along the saltwater areas that are not flood prone. Respondents were selected, using simple random sampling technique. Both descriptive and inference statistics were used for the data analysis. With a sample size of 400, a total number of 386 respondents actively participated in the research.

## 4. Findings and Discussion

**Table 1.** Sex of Respondents.

Sex	Frequency	Percent
Male	187	48.4
Female	199	51.6
Total	386	100

Source: Field survey

Table 1 shows that 48.4% of the respondents are males, while 51.6% are females.

**Table 2. Age of Respondents.**

Age	Frequency	Percent
18-25	57	14.8
26-34	74	19.2
35-50	169	43.8
51 and Above	86	22.2
TOTAL	386	100

Source: Field survey

Table 2 shows that 14.8% of the respondents are between the ages of 18-25, 19.2% of them are between the ages of 26-34, 43.8% of them are between the ages of 35-50, while 22.3% of the respondents are of the ages of 51 and above.

**Table 3. Occupation of Respondents.**

Occupation	Frequency	Percent
Farming/Fishing	206	53.4
Palm wine tapping	34	8.8
Small Scale Business	76	19.7
Others	72	18.1
Total	386	100

Source: Field survey

Table 3 shows that 53.4% of the respondents are engaged in farming/fishing, 8.8% of the respondents are engaged in Palm wine tapping, 19.7% are engaged in small scale businesses, while 18.1% of the participants are engaged in other means of livelihoods such as canoe carving, Snail picking etc.

**Table 4. Impact of Flooding on Farming.**

Response	Frequency	Percent
Flooding affects farming negatively		
Agree	101	26.2
Disagree	31	8.0
Undecided	22	5.7
Strongly Agree	204	52.8
Strongly Disagree	28	7.3
Total	386	100

Source: Fieldwork

Table 4 shows that 26.2% of the respondents agreed that flooding affects farming negatively, 8.0% disagreed, 5.7% were undecided, 52.8% strongly agreed, 7.3% strongly disagreed.

**Table 5. Impact of Flooding on Fishing.**

Response	Frequency	Percent
Flooding affects fishing negatively		
Agree	114	24.9
Disagree	29	7.5
Undecided	35	9.6
Strongly Agree	175	49.5
Strongly Disagree	33	8.5
Total	386	100

Source: Fieldwork

Table 5 shows that 24.9% of the respondents agreed that flooding affects fishing negatively, 7.5% disagreed, 9.6% were undecided, 49.5% strongly agreed while 8.5% strongly disagreed.

**Table 6. Food scarcity during and after flooding.**

Response	Frequency	Percent
Flooding causes food scarcity		
Agree	124	32.1
Disagree	25	6.5
Undecided	37	9.6
Strongly Agree	171	44.3
Strongly Disagree	29	7.5
Total	386	100

Source: Fieldwork

Table 6 shows that 32.1% of the respondents agreed that flooding causes food scarcity during and after flooding, 6.5% disagreed, 9.6% were undecided, 44.3% Strongly agreed while 7.5% strongly disagreed.

### 5. Test of Hypothesis

H<sub>0</sub> = Women are not the most vulnerable group during flooding in Southern Ijaw Local Government Area.

**Table 7. Computation of Vulnerability of Women to Flooding\* Flooding Crosstabulation.**

			FLOODING					Total
			UN	SD	D	A	SA	
VULNERABILITY	UN	Count	5	4	13	2	5	29
		Expected Count	7.4	5.3	7.1	2.8	6.4	29.0
	SD	Count	9	2	13	3	17	44
		Expected Count	11.2	8.1	10.8	4.2	9.7	44.0
	D	Count	17	3	7	4	13	44
		Expected Count	11.2	8.1	10.8	4.2	9.7	44.0
	A	Count	39	32	26	10	27	134
		Expected Count	34.0	24.6	33.0	12.8	29.5	134.0
	SA	Count	28	30	36	18	23	135
		Expected Count	34.3	24.8	33.2	12.9	29.7	135.0
Total		Count	98	71	95	37	85	386
		Expected Count	98.0	71.0	95.0	37.0	85.0	386.0

Source: Author's computation

Table 7 indicates the observed and expected frequencies of the respondents.

**Table 8.** Chi-Square Tests Statistics.

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.682 <sup>a</sup>	16	.002
Likelihood Ratio	38.494	16	.001
Linear-by-Linear Association	2.437	1	.119
N of Valid Cases	386		

Source: Author's computation

Table 8 shows the value of the chi-square statistic (37.682<sup>a</sup>), the degree of freedom (df =16), and the p value (.002). Since the p value (.002) is less than (.05), H<sub>0</sub> was rejected. Meaning that women are the most vulnerable group during flood disasters in the study area.

## 6. Discussion

By the study, women are most affected by flooding. The Chi-Square test result indicated that women are the most affected by flooding in the study area. This imply that the ravaging floods as an emergency natural phenomenon affects women more than men. The study also identified that flooding has severe impact on livelihood and that the major livelihoods of rural dwellers in the Niger Delta are farming and fishing. Also, that flooding leads to food shortage during and after the disaster. Given the fact that the main livelihoods of the rural dwellers in the region are farming and fishing, and since studies have shown that women are predominantly more involved in agriculture, and are also responsible for taking care of children and the aged, they are most vulnerable during flood disasters. This is in line with a study that shows that women constitute 60 to 80 percent of those that are engaged in agricultural work and are 90 percent responsible for caring for the children and aged in the Niger Delta rural communities [27]. It is also supports the finding that since floods cause food shortages, women and children were the most vulnerable during one of the worst flood disasters in Bangladesh in 1998 [28]. Women are thus crucial in household food security. This is a major factor that makes women more vulnerable in terms of loss of means of livelihoods during flood disasters.

It is further in line with the findings that women in Sub-Saharan Africa are more into agriculture than men. Also, Ijaw women in the Niger Delta are the primary food producer and suppliers in their household. They constitute 74.9% of the agricultural workforce in the Niger Delta region. Women are the most vulnerable in severe climatic conditions that impact livelihoods of persons, dwelling along Kaduna River basin [29-31]. The impacts of flooding on farmlands are usually severe in the study area. Flood washes off parts or entire farmlands. Also, accessibility to the farms becomes a herculean task. In some circumstances, farmers are forced to harvest immature crops to beat the flood. Crops do not grow properly in floods, it is either they get stunted, rotten, or washed away. Rivers are also polluted by flood. Fishing equipment such as nets, etc. are washed away by flood. The consequences, therefore, are scarcity of food and hunger. Food becomes scarce and expensive, leading to hunger and

poverty. The insufficiency of food in the communities due to the limitations of agricultural activities like sales of products, leads to drop in income of farmers and fishers. Since floods destroy farmlands and imminently, cause food shortages, Women who are central in household food security, becomes the most vulnerable group.

## 7. Conclusion

The study identified women as most vulnerable during flooding in the study area due to their predominance in farming and fishing. The devastating impact of flooding on livelihoods due to the destruction of farmlands and contamination of waters are enormous since farming and fishing are the main livelihoods of the rural dwellers in the study area. Thus, those who suffer loss of livelihoods and food shortage more, are women. Apart from being major suppliers of the food needs of families, women are also responsible for caring for children and the aged, who are also, vulnerable in times of flooding in the rural communities.

It was thus, recommended that:

- i. Since most flood-related livelihood devastation can be mitigated through proper floodplain management and warning systems, such should be carried out effectively by the government and flood management agencies.
- ii. It is equally imperative that the government and flood management agencies adopts a risk management approach since in practical terms, flooding can never be eliminated entirely.
- iii. Government and relevant flood management agencies should provide proper social welfare for flood victims.
- iv. Challenges of vulnerable groups such as women and children should be addressed with priority during flood and post flood periods to enhance their capacities within the communities. Various subordinating rules against women in the communities, such as lack or limited land rights should be investigated and stopped by the government.
- v. Emergency management agencies in Nigeria should endeavour to coordinate their activities to achieve optimum results. Government should properly rehabilitate flood victims and reconstruct flood-affected communities through donor agencies.
- vi. Government should provide contemporary improved seedlings which could produce crops that could be flood resistant to farmers. Inputs such as fertilizer and pesticides should be provided to boost food production.

- vii. Food security in the communities should be taken seriously by the government. Farmers and fishers should be encouraged to form cooperatives to boost their financial capacities. The provision of food through mechanized farming should be introduced. Contemporary fishing methods should also be explored.
- viii. Soft loans should be provided for farmers and fishers to defray losses during floods.

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