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Food Security and Preparedness Measures Against Flooding in Flood-Prone Areas of Cross River State

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Abstract

This study ascertained the level of preparedness towards flooding among flood-prone communities' dwellers and the food security coping strategies adopted by the communities in Cross River State. To achieve this purpose, two research questions were posed in line with the extent of flood-prone communities' preparedness measures for flooding in their communities and the food security coping strategies adopted within flood-prone communities during/immediately after flooding incidents. A descriptive survey research design was adopted for the study. From 2023 National Population Commission (NPC) records, the population comprised an estimated 169,687 community dwellers in the 25 flood-prone communities within the 9 flood-prone LGAs across the state, as documented by the National Emergency Management Agency (NEMA), as stated in the introduction of this study. A three-stage purposive sampling approach involved purposively sampling 6 relatively more food-producing LGAs before applying the same technique to sample one food-producing community from each of the LGAs. Lastly, the technique was applied to select 518 respondents (farmers) from the communities. A questionnaire tagged "Preparedness for Flooding and Food Security Coping Strategies Questionnaire" (PFFSCSQ) served as the instrument for data collection. Data analysis was conducted using descriptive statistics (frequency counts, percentages, and mean scores). Findings revealed that the respondents appear to agree more with items personal to them than those that involve the government. Also, the finding that the respondents agreed with the government as it concerns efforts after flooding incidents, i.e., making food available and provision of seedlings/fertilizers. It was also revealed that the respondents were more in agreement with ways that concerned them, seeking to ration what little food was available for them, salvaging whatever was left after a flooding incident, and consuming whatever food they found, irrespective of its nutritional value. Lastly, it was revealed that the respondents disagreed with relying on the government for assistance after flooding incidents for their food security coping strategies. Based on the findings, it was recommended among others that more emphasis be made by the relevant state emergency management parastatals on establishing and maintaining a community-based early warning system.

Keywords: Food security, climate change, flooding, flooding preparedness, food security coping strategies.

Introduction

The fundamental importance of food security in modern times is that it is one of the Sustainable Development Goals, specifically, SDG 2, which seeks to "end hunger", achieve food security and improved nutrition, and promote sustainable agriculture. Healthy and well-nourished people are the primary focus of sustainable development; therefore, food security is essential for achieving the United Nations Sustainable Development Goals (SDGs) (Dauda, 2023). This is because food security focuses on ensuring that people have consistent access to safe, nutritious, and sufficient food for a healthy life. In their description of what is food security, Food and Agricultural Organization (FAO) (2008) stated that it is a condition which exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. It is based on this description that there are six pillars of food security, namely availability, access, utilization, stability, agency, and sustainability (FAO, 2020).

In 2023, the World Food Programme asserted that Nigeria, as Africa's biggest economy and its most populous country, has the world's fifth highest burden of people experiencing food crisis or worse. Olunusi (2024) reported that in 2013, Nigeria was ranked 86th out of 107 countries on the Global Food Security Index (GFSI), and by 2022, the country dropped further to the 107th position out of 113 countries. Some of the fundamental reasons identified as significant contributors to food insecurity in Nigeria include environmental (climate change), socio-economic (poverty, inflation, conflict and insecurity, regional instability, increasing population, inefficient agricultural practices, post-harvest losses, etc.,) and political (poor policy implementation, low budgetary allocation to agriculture, etc.,) factors and among others (Ibrahim & Ibrahim, 2024).

Based on data collected concerning the Earth's surface temperature, it has been revealed that over the past 100 years, the Earth's average surface temperature has risen by 0.75°C (Idrees *et al*., 2024). Accompanying this rise are visible changes in the global weather pattern, which in turn affect natural resources and the balance of nature, upsetting seasonal cycles, disrupting ecosystems and water supply, and causing sea levels to rise. Climate change implies changes in the average variability properties of the climate, which persist over an extended period, typically within decades or longer. Evidence of climate change impacts on Nigeria includes higher temperatures, seasonal rainfall fluctuations, rising sea levels and floods, drought, desertification, land degradation, and biodiversity loss, all of which result in reduced farming productivity (Kelechi *et al*., 2022).

The ND-GAIN Index is a globally renowned index that assesses countries' vulnerability to climate change and readiness to enhance resilience (Dauda, 2023). According to the index, Nigeria is ranked 160 out of 181 countries, indicating the extent of its vulnerability to climate change impacts. An African Development Bank Report (2022) argued that Nigeria is one of the countries exceptionally vulnerable to climate change due to its potential to affect millions of people by eroding the productivity of local water and food systems and generating unintended consequences for sustainable development. Climate change is thus correlated with the food security crisis in the contemporary world because food productivity is directly affected by changes in biodiversity, global warming, increased floods, droughts, desertification, and bush farming from the effects of excessive emissions of gaseous substances and other detrimental practices (Sambo & Sule, 2024). Climate change has a sectoral influence on Nigeria because 70% of the country's population consists of subsistence farmers who rely primarily on farming for survival (Idrees *et al*., 2024). Rain serves as the primary source of sustenance for agricultural output in Nigeria, with over 90% of the subsistence farmers depending on natural sources of rainfall for farming.

Premium Times in 2017 revealed that more than 3,000 farmlands were destroyed in Boki Local Government Area by floods, which took place in mid-September of the year (Premium Times, 2017). According to the report, the affected communities were Bago, Unu, Bagabo, Bakie, Bufua, and Kakwe-Beebo, with crops such as banana, cassava, plantain, yam, and cocoa being washed away by the floods. In 2019, Vanguard Newspaper reported that numerous farmlands were washed away in 212 communities across the state by floods in July and September of that year (Vanguard, 2019). In 2021, Premium Times reported that the National Emergency Management Agency (NEMA) identified 10 LGAs in Cross River State as probable flood risk areas (Akapbuyo, Bakassi, Biase, Calabar Municipality, Calabar South, Etung, Ikom, Odukpani, Ogoja and Yakurr), with Calabar South and Abi being predicted to face more floods than the others (Premium Times, 2021). Citing the then Director-General of NEMA, the state government was urged by the Agency to commence preparedness, mitigation, and response activities to mitigate the impact. Erunke (2023) reported that according to the Federal Government, the five worst-affected states based on the 2022 floods were Jigawa, Rivers, Taraba, Cross River, and Taraba. In Cross River, almost 200,000 hectares of crops were reportedly damaged, with untold havoc wreaked on livestock and fisheries.

Reporting the 2022 floods, Elusoji (2022) cited the then Director-General of the Nigeria Hydrological Services Agency, Clement Nze, blaming the State Governments for disregarding adequate and timely warnings and other weather advisories issued by the various Federal Government agencies. Between 28 November to 5 December 2022, Displacement Tracking Matrix (DTM), in collaboration with the National Emergency Management Agency (NEMA), the Cross River State Emergency Management Agency (CREMA) and the Nigerian Red Cross Society (NCRS) identified 25 locations in 9 Local Government areas (LGAs) of Cross River state that are always affected by flood occurrences (IOM Nigeria & DTM, 2022). They are – (i) Yala (Wanihem, Itega-Ekpudu, Okpoma and Ogojah-Elekpa); (ii) Obudu - Utugwang South; (iii) Obanliku - Bebi and each of Busi 1, 2 & 3; (iv) Obubra - Apiapum and Ahaha; (v) Ikom - Ikom Urban, Okangha-Mkpansi, Agbaragba and Okuni; (vi) Etung - Itaka and Mkpot; (vii) Boki - Bashua, Biajua, Bashu and Katchuan-Buda; (viii) Abi - Ediba and Itigidi, and; (ix) Biase - Adim, Abini, Abangwan and Etono. In all locations assessed, crop/vegetable farming was the main source of livelihood before the flood. Due to the damage to farmlands/farm produce, food became the most urgent need not only of the affected population but also adjoining communities, who sold their farm produce as reported in assessed locations. All of the affected population mentioned that no support had been received since the flooding incidents.

Amata (2023) stated that despite being hit by floods in 2022, many states, including Cross River, had not embarked on any significant flood/erosion control project in Q1 of 2023, despite having a budget for such. According to The BBC News Pidgin (2024), the Nigerian Meteorological Agency (NiMET) warned that states which would witness heavy rainfall during the 2024 rainy season included the South-South states of Cross River, Akwa Ibom, Rivers, and Delta. Ewepu (2024) reported that the Annual Flood Outlook predicted monster floods for the year across 31 states, including Cross River (stated as a high-flood risk state), with the major consequence being that thousands of hectares of farmland would be washed away, thus igniting a major food crisis across the nation. Adding to that, Anyanwu (2024) reported the Hon. Minister of Environment, Mallam Balarabe A. Lawal stating that the Ministry's response to the floods this year included - (i) sending letters to all State Governments to conduct flood awareness campaigns in March 2024; (ii) issuing flood alert on September 4th which identified high-risk zones for flooding between 4th-8th September to urge them to take necessary precautions, and; (iii) urging vulnerable people to relocate from floodplains, avoid travelling to flood-

prone areas, follow evacuation orders, desilt drainage systems, people should stay informed through official channels to adhere to flood forecasts/alerts, and all flood incidences to be adequately reported. Meluwa *et al*. (2024) stated that the current Director-General of NIHSA, Umar Muhammad, reportedly urged states (including Cross River) that are predicted to be most affected by the opening of the Lagdo Dam in Cameroon within the year 2024 to brace up for the impending floods.

Available evidences show that climate change through flooding is wreaking havoc on the food security status of flood-prone communities in Cross River State. This is despite the state itself being annually listed as a high-risk flood-prone state by the country's weather prediction agencies in their annual flood prediction documents. The annual floods appear to have no measures taken to mitigate them, and the communities that are annually flooded keep on being plagued. It is based on this premise that the study's purposes were to enquire – (i) the extent to which flood-prone communities are prepared for flooding in their communities, and (ii) food security coping strategies adopted within flood-prone communities during/immediately after flooding incidence.

Research questions

1. To what extent are flood-prone communities prepared for flooding in their communities?
2. What food security coping strategies are adopted within flood-prone communities during/immediately after flooding incidence?

Literature review

Jonathan *et al*. (2020) conducted an economic analysis of the effect of flood disaster on food security of arable farming households in the southern Guinea Savanna Zone of Nigeria. They reported that flooding had a significant negative effect on the food security of farming households. They also observed that the mitigation measures by the farmers included seasonal migration, diversification of income, terracing, and early harvesting. Kayode and Abdulqadir (2021) assessed use of coping strategies for flooding among arable crop farmers in Kwara State, Nigeria and observed that the effects of flooding on farmers' arable crop farming included loss of arable crops; exposes the crops to pest and diseases; reduces all of income, crop yield and standard of living of affected farmers; increases risk of total loss of farm, and ultimately, famine and hunger in the community. In terms of coping strategies, the respondents stated that they included filling bags with sand, early planting of crops, land management practices such as shifting cultivation/terracing, upland farming, planting of different types of crops, and change of crop varieties. Lastly, responses to constraints towards adopting the coping strategies included untimely government intervention on flooding, lack of access to loans from

banks to boost production, lack of technical know-how of coping strategies, insufficient capital, inadequate information from extension agents about flood, inadequate knowledge on improved methods of coping with flooding, and poor communication network.

In a study on food security and changing climatic condition of rural farming households in Niger Delta, Nigeria, Nkeme (2021) observed that the effects of flooding on farmers' food security included – (i) farmlands and animal houses being flooded; (ii) clean water sources being polluted, and; (iii) wide-scale crop failure and higher post-harvest losses. The finding also revealed that some measures undertaken to mitigate the effect of flooding on their food security included – (i) Raising walls with sandbags and/or planting blocks to divert water; (ii) erosion control, and (iii) Undertaking other non–farm income-generating activities. Adekola *et al*. (2023) examined the effects of floods on the livelihood activities of smallholder crop farmers in Oyo State of Nigeria, and observed that floods caused food insecurity, livestock destruction, loss of farm crops, damaged farm roads, increased hunger and starvation, and damaged farm infrastructure. Their mitigation measures included crop rotation, shifting cultivation, early planting, and proper drainage construction.

In a study on flood-induced food insecurity and coping strategies with a focus on a gender-based analysis of agrarian households in south-eastern Nigeria, Akukwe *et al*. (2023), observed that only 7.2% of the households reported being food secure after experiencing floods in their area. As for coping strategies, 90% of the households reported having to skip meals, 82.3% of them stated drastically reducing number of times food is eaten while 80.7% of them reported reducing portion size of meals (80.7%). Izuagbe *et al*., (2023) conducted an impact assessment of flooding on food security in Kogi State, Nigeria. The finding showed that flooding impacted on food security in the following ways – food shortage, submerging of farmlands and markets, lowering income of food products, reduction of crop harvest, destruction of storage facilities, increase in food prices, displacing aquatic animals, and disrupting livestock businesses. Also, there were prospects for tackling floods to enhance food security, which included – (i) deviation from fossil-fuel energy production; (ii) clamour for low-level carbon emission, and (iii) organization of seminars and workshops on climate change.

The perceptions of climate change-related disasters and impact on household food security in rural farm households in Imo State of Nigeria, were ascertained by Kanu and Onyekwere (2023). Their findings revealed that about 82% of the respondents indicated that flooding has had a very high impact on household food security. The mitigation measures that the people needed Government assistance with included an improved drainage system and the establishment of a community weather

forecast centre. The effect of floods on agricultural production and marketing, and its engineering solution in Abia State of Nigeria, was investigated by Opara *et al*. (2023). They revealed that floods damaged seeds/seedlings, destroyed root crops, caused premature harvesting, affected the growth of cultivars, and harvesting operations. Mitigation measures by the farmers included use construction of adequate drainage networks, the use of sandbags, and the construction of flood embankments.

Abayomi-Oluwole *et al*. (2024) investigated flood mitigation strategies and food sustainability in Kogi State. Their findings on the impact of flooding on food security included – (i) significantly decreased agricultural productivity; (ii) negatively affected availability of locally produced food; (iii) disrupted transportation of agricultural produce to markets, and; (iv) increased each of post-harvest crop/food losses and prices of food in the community. Their finding also revealed that the respondents rejected all of the following as effective flood mitigation strategies towards food security: (i) affordable transportation of basic food to riverine communities; (ii) staple food price control, and (iii) empowerment for dry season farming. Rather, the study revealed that they accepted the following as effective flood mitigation strategies towards food security: (i) farmers' vulnerability reduction; (ii) adequate/timely awareness of crops' harvesting, and (iii) training programmes for farmers on flood risk reduction. Nwangwu *et al*., (2024) assessed the impact of climate change on flood-prone smallholder rice farmers in South-East Nigeria and reported that frequent flooding caused reduced rice yield/quantity and also exposed the farmers to higher food insecurity levels. They also reported that some of the flooding mitigating measures taken included keeping sandbags, creating drainage, and building water-gates.

An evaluation of rural communities' coping strategies with flood-driven food insecurity in Delta State, Nigeria was conducted by Ofuoku *et al*., (2024). Their investigation included verifying the effect of flooding on food production and food security, and food security coping strategies against floods. The results showed that the effect of flooding on food production included loss of fish in earthen ponds, submersion of natural ranching and farming, destruction of crops/food, and loss of livestock. From the respondents, it was deduced that the food security index fell by approximately 12%. Lastly, the food security coping strategies included relocation, planting of early maturing crops, livelihood diversification, constructing dykes around fish ponds, and placing sand bags around farms and houses. A comprehensive examination of the impact of flooding on agricultural communities' income, livelihood stability, and food security in Benue State of Nigeria was conducted by Yahaya *et*

al. (2024). From their findings, 85% and 56% of their 400 respondents, respectively, reported a decrease in food production and difficulties in accessing food due to the prevalence of floods in their area. Their finding also revealed that only 20% of the respondents indicated that the Government's response to flooding in their area was very effective, while the responses from the remaining 80% ranged from moderately effective to ineffective in terms of the Government's response.

From the available and accessible literature reviewed, it is apparent that studies concerning the extent of preparedness measures against flooding in flood-prone areas in line with food security are very rare within the state. This is despite the ravaging impact that flooding has wreaked on flood-prone areas, as it concerns food security. It is based on this point that this study was necessitated.

Methodology

The study adopted a descriptive survey research design. The population comprised an estimated 169,687 community dwellers (NPC, 2023) in the 25 flood-prone communities within the state's 9 flood-prone LGAs, as documented by NEMA. A three-stage purposive sampling approach involved purposively sampling 6 relatively more food-producing LGAs before applying the same technique to sample one relatively more food-producing community from each of the LGAs. Lastly, the technique was applied to select 518 respondents (farmers) from the communities (see Table 1 for details). The data collection instrument was the "Preparedness for Flooding and Food Security Coping Strategies Questionnaire" (PFFSCSQ). It had sections A and B. Section A was designed to obtain data of the respondents' demographics while Section B elicited responses concerning preparedness for flooding, and food security coping strategies (6 items each) all with a response rubric of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD).

The instrument was validated by two experts in Measurement and Evaluation in the Department of Educational Foundations and two experts in the Department of Environmental Education, who ascertained the degree to which the items on the instrument measured what it is expected to measure. The reliability of the instrument was ascertained by conducting a trial test with 30 respondents from communities that were not part of the sample, and the obtained data was analysed using the Cronbach Alpha reliability method. The reliability coefficients for preparedness for flooding and food security coping strategies were .88 and .74, respectively. The data collection for the study was done by the researchers in conjunction with 4 research assistants and lasted about 6 weeks. The data collected were analysed using descriptive statistics (frequency counts, percentage scores, and

mean scores). The decision of agreement for the mean scores was in a manner that 0 - 1.00 indicated a strongly disagreed opinion, 1.01 – 2.00 was disagreed, 2.01 – 3.00 was agreed, while 3.01 – 4.00 was strongly agreed.

TABLE 1
Communities and sample for the study

S/N	LGA	Community	Sample
1.	Abi	Ediba	195
2.	Biase	Abini	109
3.	Etung	Mkpot	45
4.	Ikom	Agbaragba	28
5.	Obubra	Apiapum	120
6.	Yala	Wanihem	21
		TOTAL	518

Presentation of results

(i) Research question one

The first research question enquired into the extent to which flood-prone communities prepared for flooding in their communities. To answer this question, the test items were analysed using descriptive statistics (frequency counts, percentage scores, and mean scores). The result of the analysis is presented in Table 2. Based on the pattern of the response rubric of the instrument's test items, the decision for each test item is Strongly Disagree (SD) for items whose mean score ranges from 0–1.00, Disagree (D) for items ranging from 1.01–2.00, Agree (A) for 2.01–3.00, and Strongly Agree (SA) for those whose score ranges from 3.01–4.00.

TABLE 2
Frequency counts, percentage scores, and mean scores for responses concerning flood-prone communities' preparedness for flooding incidence

	Farmers'/community-based measures towards mitigating the flood impact on food security in my community includes	SA	A	D	SD	$\bar{x}$	Dec.
1	Relocation of farmland to higher ground	131 (25.3%)	139 (26.8%)	127 (24.5%)	121 (23.4%)	2.54	A
2	raising/creating barriers at the edges of the farmland	248 (47.9%)	198 (38.2%)	46 (8.9%)	26 (5.0%)	3.29	SA
3	Seeking flood prediction information by NIHSA	43 (8.3%)	28 (5.4%)	175 (33.8%)	272 52.5%)	1.69	D
4	Planting flood-tolerant crops	251	152	73	42	3.18	SA

		(48.5%)	(29.3%)	(14.1%)	(8.1%)		
	Government-assisted preventive measures towards mitigating the flood impact in my community include						
5	providing/maintaining community-based early warning systems	11 (2.1%)	28 (5.4%)	174 (33.6%)	305 (58.9%)	1.50	D
6	enforcing locals away from flood-pror areas areas	67 (12.9%)	92 (17.8%)	129 (24.9%)	230 (44.4%)	1.99	D
7	making available food for victims after flooding incidents	77 (14.9%)	178 (34.4%)	119 (22.9%)	144 (27.8%)	2.36	A
8	providing improved seedlings and fertilizer after flooding incidents	174 (33.6%)	223 (43.1%)	65 (12.5%)	56 (10.8%)	2.99	A

(ii) Research Question Two

The second research question enquired what food security coping strategies are adopted within flood-prone communities during/immediately after flooding incidence. To answer this question, the test items were analyzed using descriptive statistics (frequency counts, percentage scores, and mean scores). The result of the analysis is presented in Table 3. Based on the pattern of the response rubric of the instrument's test items, the decision for each test item is Strongly Disagree (SD) for items whose mean score ranges from 0–1.00, Disagree (D) for items ranging from 1.01–2.00, Agree (A) for 2.01–3.00, and Strongly Agree (SA) for those whose score ranges from 3.01–4.00.

TABLE 3

Frequency counts, percentage scores, and mean scores for responses concerning food security coping strategies adopted within flood-prone communities during/immediately after flooding incidence

	During/immediately after a flood incidence, food security coping strategies i my community includes	SA	A	D	SD	$\bar{x}$	Dec.
9	rationing the scarcely available food amon household members	323 (62.3%)	156 (30.1%)	12 (2.4%)	27 (5.2%)	3.50	SA
10	Depending on the available food brought by government agencies	65 (12.5%)	56 (10.8%)	174 (33.6%)	223 (43.1%)	1.93	D
11	accessing the remaining food left un-destroyed in our homes and farms	329 (63.5%)	145 (28.0%)	20 (3.9%)	24 (4.6%)	3.50	SA
12	seeking access to food aid sent by emergency agencies	50 (9.7%)	38 (7.3%)	178 (34.4%)	252 (48.6%)	1.78	D
13	utilizing food deemed safe for consumptio	294 (56.8%)	160 (30.9%)	28 (5.4%)	36 (6.9%)	3.37	SA
14	consuming available food irrespective of nutritional value	280 (54.1%)	168 (32.4%)	28 (5.4%)	42 (8.1%)	3.32	SA
15	Harvesting and storing whatever food is n destroyed on the farm so as to achieve foo stability overtime	316 (61.0%)	136 (26.3%)	26 (5.0%)	40 (7.7%)	3.41	SA
16	relying on government-assisted efforts designed to enhance food stability in my community	12 (2.3%)	52 (10.0%)	160 (30.9%)	294 (56.8%)	1.58	D

From Table 2, as regards flood-prone communities' preparedness for flooding incidence, the decisions for relocation of farmland to higher ground ($\bar{\alpha}$ = 2.54), raising/creating barriers at edges of farmland ($\bar{\alpha}$ = 3.29), seeking for flood prediction information by NIHSA ($\bar{\alpha}$ = 1.69), and planting flood tolerant crops ($\bar{\alpha}$ = 3.18), respectively, were A, SA, D and SD while the decisions for government's provision/maintenance of community-based early warning systems ($\bar{\alpha}$ = 1.50), government's enforcing locals away from flood-prone areas ($\bar{\alpha}$ = 1.99), government's making available food for victims after flooding incidents ($\bar{\alpha}$ = 2.36), and government's provision of improved seedlings and fertilizer after flooding incidents ($\bar{\alpha}$ = 2.99) were D, D, A and A.

From Table 3, as regards food security coping strategies adopted within flood-prone communities during/immediately after flooding incidence, the decisions for rationing the scarcely available food among household members ($\bar{\alpha}$ = 3.50), depending on the available food brought by government agencies ($\bar{\alpha}$ = 1.93), accessing the remaining food left un-destroyed in our homes and farms ($\bar{\alpha}$ = 3.50), and seeking for access to food aid sent by emergency agencies ($\bar{\alpha}$ = 1.78),

respectively, were SA, D, SA and D while the decisions for utilizing food deemed safe for consumption ($\bar{\alpha}$ = 3.37), consuming available food irrespective of nutritional value ($\bar{\alpha}$ = 3.32), harvesting and storing whatever food not destroyed in the farm so as to achieve food stability overtime ($\bar{\alpha}$ = 3.41), and relying on government-assisted efforts designed to enhance food stability in my community ($\bar{\alpha}$ = 1.58) were SA, SA, SA and D.

Discussion of Findings

The result of the first research question revealed that the respondents appear to agree more with items personal to them than those that involve the government. For instance, their agreement in line with relocation to higher ground, raising/creating barriers at the edges of their farmland, and planting flood tolerant crops while disagreeing as it concerns seeking for flood prediction information, government's provision of community-based early warning systems, and government's enforcement of relocating locals from flood-prone areas. Secondly, it appears that people agree with the government as it concerns efforts after flooding incidents, i.e., making food available and providing seedlings/fertilizers. The finding aligns with those of Kayode and Abdulqadir (2021), Nkeme (2021), Akukwe *et al*. (2023), Kanu and Onyekwere (2023), Opara *et al*. (2023), and Nwangwu *et al*. (2024), who all revealed similar findings as it concerns flood-prone communities' preparedness towards flooding incidents.

The result of the second research question revealed that the respondents were more in agreement with ways that concerned them, seeking to ration what little food was available for them, salvaging whatever was left after a flooding incident, and consuming whatever food they found, irrespective of its nutritional value. Once again, they disagreed, relying on the government for assistance after flooding incidents for their food security coping strategies. Perhaps it could be that government efforts towards their food security coping strategies are ineffective or insufficient in their own opinion? The finding is in line with those of Jonathan *et al*. (2020), Abayomi-Oluwole *et al*. (2024), Ofuoku *et al*. (2024), and Yahaya *et al*. (2024), who all reported similar findings as it concerns flood-prone communities' food coping strategies after a flood incidence.

Flooding is a yearly occurrence in Nigeria and is expected to increase due to the ever-increasing effects of climate change. The Federal Government of Nigeria failed to heed early warnings by relevant agencies and was unprepared to manage the 2012 flood, which was one of the most

devastating in the country. Similarly, state governments were seemingly blamed for the mismanagement of the 2022 flood, which wreaked similar havoc to the 2012 incident. Efforts towards mitigating the adverse effects of floods have mostly bordered on treating the symptoms rather than addressing the root causes, as reported based on the findings of this study. Farmers across the country, on their part, are planting early maturing varieties of crops and flood-resistant varieties of staple crops in their regions, and some also depend on indigenous meteorological knowledge.

These efforts, though laudable, are not enough to protect farmers in the event of severe flooding shortly. The federal government has made some efforts to mitigate floods, but there is a need to do more. Setting up the early warning system is a good development, but there is a need for more sensitization of farmers to heed early warnings. Farmers should be encouraged to insure their crops. The government should be proactive and invest massively in flood mitigation methods such as building dams, dredging of rivers, clearing of drainages, and natural waterways, etc. Without massive investment in flood mitigation measures, families within flood-prone communities would undergo an endless cycle of being annually exposed to high food insecurity. A massive investment would also go some way to reducing funds that would be allocated to providing food and shelter after flooding incidents. Finally, relevant flood prevention agencies should be well funded, and the funds carefully monitored to avoid mismanagement.

Conclusion

Based on the findings, it was concluded that – (i) indigenes of flood-prone communities were mostly left to prepare themselves for impending floods with negligible assistance from relevant state government agencies with regards to preparedness while on the other hand, they were somewhat in agreement concerning relevant state government agencies' efforts in line with assisting them after flooding incidents, and; (ii) indigenes of flood-prone communities rationed what little food was available for them, salvaging whatever was left after a flooding incidence, and consuming whatever food they found irrespective of its nutritional value while on the other hand, disagreeing that they relied on government for assistance after flooding incidences for their food security coping strategies.

Recommendations

Based on the findings, the following recommendations were made by the researcher

1. More emphasis should be made on establishing and maintaining community-based early warning systems by the relevant state emergency agencies.
2. Federal weather predicting agencies should be more empowered to liaise directly with state emergency management agencies in order to more impactful on flood-prone communities.
3. Efforts should be made by all relevant state and federal agencies to address the remote causes of flooding than treating the symptoms.
4. Lastly, there should be agencies created by the Federal and State governments to monitor and ensure that flood-prone states practically implement their budgets designed for addressing flood-based issues in their states.

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