



COPING STRATEGIES UTILIZED BY CROP FARMERS AND ARTISANAL FISHERMEN IN CUSHIONING THE EFFECTS OF COASTAL FLOODING IN SOUTH-SOUTH NIGERIA

*¹Emerhirhi, E, ²Nnadi, F.N., ²Ukpongson, M.A., ²Ajaero, J.O. and ³Okoroma, E.O.

¹Department of Agricultural Education, Federal College of Education (Technical) Omoku, Rivers State, Nigeria

²Department of Agricultural Extension, Federal University of Technology, Owerri, Nigeria

³Department of Agricultural Extension and Rural Development, University of Uyo, Nigeria

Corresponding email: ibetuemily@gmail.com

Phone: +2348068420086

ABSTRACT

The deleterious impact of coastal flooding on livelihoods necessitated this study that analyzed the effects of coastal flooding on selected livelihoods in South-South, Nigeria. This study assessed coping strategies to cushion the effects of coastal flooding on crop farmers and artisanal fishermen in South-South Nigeria. The objectives included to: describe the socioeconomic characteristics of crop farmers and artisanal fishermen in the area and identify coping strategies by the crop farmers and fishermen, as well as investigated the coping strategies used by crop farmers and fishermen to cushion the effect of coastal flooding in the three selected States of the study do not differ significantly. A total of 450 crop farmers and artisanal fishermen were sampled for the study. Data were collected using a set of structured questionnaire and analyzed using frequency tables and percentages. The results indicated 55.6% married, educated (98.5%), livelihood experience of 8.9 years with mean household size of 7, income of N336.722 and mean age of 51 years. The coping strategies used by the crop farmers included labour migration (97.3%), diversification of livelihood, (95.1%), and resettlement (78.1%), while the ones used by artisanal fishermen were migration of labour (96.4%), diversification of livelihood (94%), and moving into Internally Displaced Persons' Camp (82.8%). The study concludes that labour migration, seeking more information, engagement in non-farming and non-fishing activities, dependence on remittance; shore protection and clearing of waterways by the government are common measures adopted to cope with the negative impacts of coastal flood in South-South Nigeria. Hence, it is recommended that private and agencies of the government should undertake intervention measures that increase the capacity of crop farmers and artisanal fisher forks in coping with environmental and livelihood losses.

Keywords: Coping strategies, climate change, Coastal flood, Crop farmers, artisanal fishermen

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INTRODUCTION

The world is constantly faced with various forms of disaster which adversely affect lives on earth. Flood menace in Nigeria has become a re-occurring phenomenon which sometimes has devastating impacts on human livelihoods and infrastructural

development. Causes of this problem such as rapid population growth, poor governance, poor drainage facilities and decaying infrastructure, lack of proper environmental planning and management strategies, poor practice of dumping waste/refuse and climate change coupled with inadequate

preparedness have been traced among other human activities (World Bank, 2020).

The impacts of floods are more pronounced in low-lying areas. In more recent years, 2011, 2012, and most recently 2022 appear to be the worst years of incidence of flooding in Nigeria with a lot of reported cases indicating how flood menace ravaged and affected States of the country when water from the Lagdo Dam in Cameroon was released. Although the Nigerian Meteorological Agency (NIMET) had alerted Nigeria that there would be an above normal rainfall in strategic parts of the country which might lead to flooding incidence in 12 States of the federation, yet nobody gave consent to that warning (Echendu, 2020; Osayomi, Jr, Ogunwumi *et al.*, 2022).

The occurrence of a particular type of flood depends on the location. Areas located along the coastal plains are susceptible to coastal flooding. Coastal flooding results from the over-flow of rivers in low-lying belts of mangrove and fresh water swamps (Croitoru *et al.*, 2020). In Nigeria, it is experienced mainly in the Niger Delta areas affecting such States as Rivers, Akwa-Ibom, Cross River, Bayelsa, Delta and Edo. Natural flooding can be attributed to heavy or torrential rains or rainstorm and ocean storms, heavy rainfall and tidal waves, usually along the coast and wildfires which reduce the supply of vegetation that can absorb rainfall (Keller and DeVecchio, 2019). In 2012, Nigeria experienced its worst flooding in recent history (Nkeki, 2012). More than 2.3 million people were displaced, 363 lost their lives and another 16 million people were impacted in various ways and years of development gains were reversed (Nwigwe and Emberga, 2014; Echendu, 2020). Total losses were put at US\$16.9 billion. In reality, the extent and nature of Nigeria's flooding are such that the actual figures for displacements, losses, and

fatalities cannot be truly ascertained (Cirella and Iyalomhe, 2018; Nkwunonwo, *et al.*, 2015). These affect livelihoods.

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living (Madzivhandila and Owusu, 2024). It is represented as a whole of dynamic interactions between actors and five vital capitals i.e. human, natural, physical, financial, and social capital. These capitals constitute livelihood building blocks (Carney, 2010), which could be affected by annual flooding in major cities and communities across the world. Nwafor (2006) and Agbonkhase *et al.* (2014) classified the effects of flooding based on categories of livelihood into five: human resource-based, natural resource-based, physical resource-based, monthly income and monetary asset-based. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Scoones, 1998). Many rural livelihoods are reliant to a considerable degree on the environment and the natural resource base (Scoones, 1998). Livelihood activities such as fishing, forestry, and gathering of wild plants and materials, directly depend on the availability and health of natural resources like soil, water, forests, and wildlife. Hence, when the environment is impacted by extreme climate events such as flooding, the farmers' livelihood is affected because without access to these resources, farmers would struggle to sustain their economic activities (Saldaña-Zorrilla, 2007; Madzivhandila and Owusu, 2024).

In the wake of the flooding cases in South-South region of Nigeria, many crop farmers and artisanal fishermen in the region have faced severe disruptions to their livelihoods. As floods damaged crops, farmlands, and fishing areas, it becomes difficult for the crop farmers and fishermen

to continue their usual agricultural and fishing practices, undermining their ability to earn a living and support their families. (Week and Wizer, 2020). Unfortunately, despite the significant impact of coastal flooding, there is a noticeable absence of comprehensive studies that explore the coping strategies these individuals have utilized to cushion the effects of such disasters. With intense rain and flooding expected in the future due to increasing climate variability, the subsisting information gap is impeding the adoption of adequate coping strategies by the farmers and artisanal fisher folks, as well as undermining efforts to develop effective support mechanisms and policy interventions that could help these communities better withstand and recover from flooding events (Nemine, 2015; Omoja *et al.*, 2021).. This study therefore seeks to analyze the coping strategies employed by crop farmers and artisanal fishermen in the South-South region of Nigeria to mitigate the effects of coastal flooding. Understanding these strategies is crucial for informing the development of sustainable and context-specific interventions aimed at enhancing the resilience of these vulnerable communities against future flooding incidents.

Objectives of the Study

Specifically, the objectives of the study include to:

- i. describe the socioeconomic characteristics of crop farmers and Artisanal fishermen affected by coastal flooding in South-South, Nigeria;
- ii. identify the coping strategies put in place by crop farmers and artisanal fishermen to cushion the effects of coastal flooding in the study area;
- iii. investigate constraints to the use of coping strategies by the crop farmers, and artisanal fishermen.

METHODOLOGY

The study was conducted in the South-South Zone of Nigeria, an area that encompasses approximately 2,370 square kilometers of rivers, creeks, and estuaries, and around 8,600 square kilometers of stagnant swamps (NIMET, 2020). This zone includes the states of Edo, Delta, Bayelsa, Rivers, Akwa Ibom, and Cross River. The ecosystems in this region support a rich diversity of terrestrial and aquatic flora and fauna, as well as human life (Uyigie and Agho, 2007). The total population of the South-South Zone as at 2016 stands at 28,829, 288 (Akujuru and Enyioko. 2017) and the area experiences annual rainfall exceeding 4,000mm. The wetlands in this region are crucial for providing food, water, and livelihood security for the impoverished communities living in the delta area. However, several livelihood activities, such as tree felling and bush burning by rural households, have increased the region's vulnerability to flooding. Multi-stage sampling procedure was used to select the sample for the study as shown in Table 1. The first stage was the purposive selection of three States which are Bayelsa, Rivers, and Delta States from the South South zone where flood menace has taken place and was widely reported. The second stage involved the purposive selection of 2 most affected LGAs which are Yenagoa and Brass for Bayelsa State; Ughelli South and Udu Local Government Areas for Delta and Ogba Egbema Ndoni and Ahoada East for Rivers. The third stage, involved the purposive selection of 3 most affected/ coastal flood prone communities which are Effuru-Otor, Olomu, Ekrokpe (Ughelli South, Delta State). Ubogo, Eginini and Ogbe Udu for Udu Local Government Area. Omoku, Ebocha, Ndoni for Ogba Egbema Ndoni Local Government Area. Ahoada, Mbiama and Okobe for Ahoada East Local Government. Swali, Igbogene, Tombia for Yenagoa Local

Government Area. For Brass, Fatua, Brass and Akasa were sampled. These made up a total of 18 communities. In the final stage, the list of all coastal flood affected household heads involved in crop farming and artisanal fishing was obtained from the community

leaders and extension officers and used to select the respondents. Descriptive statistical tools, namely: frequency distribution and percentage score were used in analyzing the data collected.

Table 1: Sampling frame/distribution of affected communities’ population and respondents

States	LGAS	Communities	Affected Population	Total Sample Size
Bayelsa	Yenagoa	Swali	360	36
		Igbogene	240	24
		Tombia	300	30
	Brass	Fantua	250	25
		Brass	350	35
		Akasa	300	30
				180
Rivers	Ogba, Egbema Ndoni	Omoku	190	19
		Ebocha	183	18
		Ndoni	160	16
	Ahoada	Ahoada	202	20
		Mbiama	200	20
		Okobe	120	12
			106	
Delta	Ughelli South	Effurun- Otor	300	30
		Olomu	260	26
		Ekropke	350	35
	Udu	Ubogo	210	21
		Egini	270	27
		Ogbe Udu	250	25
				164
Total	6	18	4,500	450

Source: Field survey data (2024),

RESULTS AND DISCUSSION

The Socioeconomic Characteristics of Crop Farmers and Artisanal Fishermen

Result in Table 2 revealed several critical insights into the demographics and socioeconomic characteristics of the respondents from Delta, Rivers, and Bayelsa States. A significant gender disparity is evident, with the majority of respondents in Delta and Rivers States being male (61.82% and 59.21%, respectively), while Rivers State

had a majority of female respondents (48.1%). This gender distribution raises questions about gender roles and participation in agricultural and fishing activities across these states. This can also affect their coping strategy since financial and material resources needed to cope reside more with the male gender (Izidor and Nwaenyi, 2021).The average age of respondents was 47 years, indicating a relatively mature population engaged in these livelihoods. Household sizes varied

significantly, with Delta State recording modal average of eleven persons, followed by Rivers seven persons, and Bayelsa six persons. This variation in household size could influence the capacity for labor and resource allocation within households (Okoli *et al.*,2022).

Experience levels also differed markedly by state. Bayelsa State respondents reported the highest mean years of experience (30 years), suggesting a deep-rooted engagement in their respective livelihoods, compared to Delta State (18 years) and Cross River (8 years). This disparity might reflect differences in the stability and continuity of livelihood practices in these regions (Ikehi *et al.*,2022). Income levels also varied, with the mean income of respondents being N 379,176.

Marital status data indicated that over 69.5% of respondents were married, which might impact the social dynamics and decision-making processes within households (Hussaini and Matazu, 2023). Educational attainment was generally average, as majority (44.5%) had secondary education, thereby highlighting potential challenges in adopting advanced agricultural techniques and/or access to agricultural information that may demand some level of literacy to decode, interpret or utilized.

Coping strategies adopted during coastal flooding by artisanal fishermen and crop farmers.

The range of strategies employed by fishermen to cope with environmental and economic challenges is as shown in Table 3 below. These strategies include labor migration (96.4%), livelihood diversification (94.8%), engagement in non-fishing activities (82.2%), sourcing information (57.7%), engagement in religious activities (51.3%), receiving palliatives (66.4%), relocation (79.7%), raising platforms for processing (80.8%), dependence on

remittances (77.3%), and moving to IDP camps (94.4%). While the fishermen's resilience and determination to sustain their livelihoods is commendable, the effectiveness and sustainability of these coping strategies raise critical concerns.

The high reliance on labor migration and non-fishing activities suggests a significant shift away from traditional fishing, which could undermine the cultural and economic fabric of these communities (Padhan and Madheswaran, 2023). A closer examination revealed substantial variation in coping strategies across different states. For instance, Bayelsa respondents used ten coping measures with over 40% frequency, while Delta had three measures and Rivers had two measures below the 40% threshold. This disparity indicates that the environmental and socio-economic contexts significantly influence the adoption of coping strategies (Mabuku *et al.*,2019). In Bayelsa, the highest-rated strategy was livelihood diversification (87.8%), reflecting a proactive adaptation to changing circumstances. Conversely, Delta State respondents predominantly engaged in non-fishing activities (99.3%), highlighting a more drastic departure from traditional livelihoods. In Rivers State, labor migration (98.1%) was the most common strategy, suggesting a significant outflow of labor, which might affect the community's long-term stability (Izidor and Nwaenyi, 2021).

The least utilized strategy across all states was the use of floating ponds, with only 21.6% adoption in Bayelsa state, 21.9% in Rivers state, and 19.4% in Delta state. Respondents cited lack of knowledge as the primary reason for the low uptake. Floating ponds offer a stable, sedentary alternative to traditional fishing and could mitigate some risks associated with flooding, suggesting a need for targeted education and capacity-building efforts to promote their use (Okoli *et al.*,2022). Specific strategies varied by state.

Bayelsa respondents heavily relied on labor migration (94.4%), livelihood diversification (97.2%), relocation (81.6%), dependence on remittances (96.6%), and information sourcing (62.2%). In Delta State, labor migration (93%), engagement in non-fishing activities (99.3%), livelihood diversification (93.9%), and raising platforms for processing (96.3%) were predominant. In Rivers State, significant measures included moving to IDP camps (95.2%), raising platforms for processing (83.9%), receiving palliatives (82%), and relocation (92.4%).

These findings highlight a critical need for comprehensive support systems. While the farmers' and fishermen's resilience is notable, government assistance and targeted interventions are essential to enable them to leverage these coping strategies effectively and move beyond subsistence and vulnerability. Additionally, addressing knowledge gaps, such as the benefits of floating ponds, could enhance the sustainability and efficacy of coping strategies across these regions.

Coping strategies used by crop farmers during coastal flooding

The coping strategies employed by crop farmers in response to coastal flooding, as shown in Table 4, include labor migration (97.3%), livelihood diversification (95.1%), relocating to IDP camps (79.7%), resettlement (78.1%), and engagement in non-farming activities (72.8%). Additionally, planting short-duration crops (72%) and flood-resistant crops (72%) are notable strategies. The reliance on remittances (54.1%) and participation in skill acquisition programs (56.2%) were also significant measures. A critical examination reveals that these strategies, while diverse, underscore the farmers' urgent need to adapt and survive amidst recurring environmental threats. The high percentages of labour migration and livelihood diversification indicate a

significant shift away from traditional farming, which may undermine the long-term sustainability of agricultural practices in these regions (Deb and Haque, 2016).). The results further show that across Bayelsa, Delta, and Rivers states, the use of coping strategies was widespread. However, some measures, such as remittances (37.2% in Bayelsa) and increased religious activities (36.5% in Delta and 28.5% in Rivers), had lower adoption rates. This suggests variability in the effectiveness and accessibility of certain coping mechanisms depending on local contexts and resources available (Aravalath and Kasim, 2022). The reliance on a broad spectrum of strategies highlights the farmers' resilience and determination to overcome the adverse effects of coastal flooding. This resilience is commendable, and indicative of a strong will to sustain livelihoods despite significant challenges. However, it also points to a systemic failure in providing adequate institutional support and infrastructure to mitigate such disasters effectively (Uddin, 2020).

The implementation of strategies, such as planting short-duration and flood-resistant crops demonstrates adaptive agricultural practices that could be more widely promoted and supported through governmental and non-governmental initiatives. Moreover, the substantial engagement in non-farming activities and labor migration reflects a broader socio-economic shift that could have long-term implications for rural agricultural communities (Izidor & Nwaenyi, 2021). Given the evident determination of farmers to adapt and survive, it is imperative for government and policy-makers to enhance support systems and provide robust interventions. This includes improving access to information, financial support, and training on sustainable agricultural practices. Effective government action could

significantly bolster these communities' resilience, enabling them to not only cope but potentially thrive in the face of environmental adversities.

Table 2: Distribution of respondents by Socioeconomic Characteristics of Crop Farmers and Artisanal Fishermen in the Study Area

Variables	Bayelsa State		Rivers State		Delta State		Pooled	
	F	%	F	%	F	%	F	%
Age								
30 – 40	18	10	10	9.43	39	23.8	67	14.9
41 – 50	46	25.7	35	33.0	47	28.7	128	28.4
51 – 60	97	53.7	41	38.7	60	36.6	198	44.0
61 and above	19	10.6	20	19.0	18	10.9	57	12.7
Mean (Years)	50		52		48.9		50.9	
Sex								
Male	101	56.2	55	51.9	102	62.2	258	57.3
Female	79	43.8	51	48.1	62	37.8	192	42.7
Marital Status								
Married	130	72.2	64	60.4	83	50.6	250	55.6
Widow	30	16.7	23	21.7	34	20.7	87	19.3
Widower	15	8.3	10	9.5	28	17.1	53	11.8
Divorce	5	2.8	9	8.4	19	11.6	33	7.3
Household Size								
1 – 4	47	26.1	24	22.7	38	23.2	109	24.2
5 – 8	98	54.5	54	50.9	57	34.8	209	46.5
9 and above	35	19.4	28	26.4	69	42.0	132	29.3
Mean	6		7		11		7	
Educational Level								
No Formal Education	7	3.8	0	0.0	2	0.4	7	1.5
Adult Education	24	13.3	4	0.9	9	2.0	41	9.1
Primary	63	35.1	37	8.2	37	8.2	187	41.6
Secondary	76	42.2	60	13.3	111	24.7	200	44.5
Tertiary	10	5.6	5	1.1	5	1.1	15	3.3
Years of Experience								
1 – 5	30	16.6	22	20.7	34	20.7	86	19.1
6 – 10	93	51.7	30	28.4	67	40.9	190	42.2

Source: Field survey data (2024). F = Frequency of occurrence.

Table 3: Distribution of respondents by coping Strategies used by Artisanal fishermen in three states

Coping Strategies	States						Pooled	
	Bayelsa		Rivers		Delta		F	%
	F	%	F	%	F	%		
Migration of labour	176	94.4	154	93.9	104	98.1	434	96.4
Engagement in non-fishing activities	106	58.8	163	99.3	100	95.2	370	82.2
Diversification of livelihood	175	97.2	154	93.9	100	94.3	427	94.8
Relocation	147	81.6	114	69.5	98	92.4	359	79.7
Receiving palliatives	114	63.3	98	59.7	87	82.0	299	66.4
Use of floating ponds	30	21.6	40	24.3	40	37.7	110	24.4
Raising platforms for processing	117	65.0	158	96.3	89	83.9	364	80.8
Packing into IDP camp	122	67.7	150	91.4	101	95.2	373	82.8
Dependence on remittance	174	96.6	99	67.8	74	69.8	260	57.7
Sourcing information	112	62.2	84	51.2	64	60.3	260	57.7
Engagement in religious activities	84	46.6	60	36.5	87	82.7	231	51.3

Source: Field Survey data (2024). F = Frequency of occurrence.

Table 4: Distribution of respondents by coping strategies adopted by Crop farmers in the study area

Coping Strategies	States					
	Bayelsa		Rivers		Delta	
	F	%	F	%	F	%
Labor migration	178	98.8	160	87.1	100	60.9
Diversification of livelihood activities	110	61.1	154	93.9	104	98.1
Resettlement	144	80	114	69.5	97	91.5
Receiving palliatives	97	53.8	142	86.5	84	79.2
Skill acquisition	74	41.1	115	70.1	64	60.7
Depend on remittances	67	37.2	133	81.0	45	42.5
Engagement in non-farm activities	88	48.8	139	84.7	101	95.2
Planting short duration crops	100	55.5	84	51.2	93	87.1
Planting flood resistance crops	141	78.3	98	59.7	85	80.1
Relocating to IDP camp	161	80.4	124	75.6	74	69.8
Increased religious activities	80	44.4	60	36.5	30	28.3
Seeking more information on survival	110	61.1	120	73.1	85	80.1

Source: Field survey data (2024). F = Frequency of occurrence.

Constraints to the use of coping strategies by crop farmers and artisanal fisher folks

The constraints to the use of coping strategies, as detailed in Table 5 revealed a complex web of challenges that significantly hinder effective adaptation to coastal flooding. These constraints include poor government policies (91.7%), poor access to information (80%), lack of knowledge about better strategies (91.7%), cultural beliefs (78.8%), insufficient capital (96.2%), limited access to improved crop varieties/species (80.2%), inadequate care and information about IDP camps (88.4%), and health issues (72.4%). Additional barriers identified were poor extension support (87.3%), low educational levels (64.8%), high labor costs (91.3%), and inadequate infrastructure (91.7%). Further analysis revealed significant regional variations in these constraints. For instance, in Bayelsa State, 92.7% of respondents indicated poor knowledge of many existing strategies alongside a low capital base (97.2%), poor government policies (81.3%), poor infrastructure (94.4%), inadequate extension services (91.1%), and high labor costs (96.6%). These findings are consistent with similar constraints identified in Delta State, where poor knowledge of strategies (90.8%), low capital base (93.9%), poor infrastructure (88.4%), inadequate extension support (81.7%), and cultural beliefs (96.3%) were prominent. Similarly, in Rivers State, key constraints included poor knowledge of strategies (91.5%), poor education (83%), low capital base (98.1%), poor government policies (85.6%), poor infrastructure (92.4%), and health disorders (80%).

The pervasive nature of these constraints underscores the critical role of government and institutional support in mitigating the impacts of natural disasters. The high percentage of respondents citing

poor government policies and inadequate institutional support highlights a significant gap in effective governance and disaster management. The lack of robust and well-implemented policies severely hampers efforts to provide the necessary support for flood victims, thereby exacerbating their vulnerabilities (Adegboye, 2011). Poor access to information and inadequate extension services can affect farmers' productivity because without reliable information and technical support, farmers are left ill-equipped to implement adaptive measures, which could otherwise enhance their resilience. This information deficit is compounded by cultural beliefs and low educational levels, which further inhibit the adoption of innovative practices and technologies (Orisakwe and Okoroma, 2020). The prevalence of economic constraints, such as insufficient capital and high labor costs, highlights the economic barriers that limit farmers' ability to invest in adaptive strategies. This financial incapacity restricts their access to improved crop varieties and necessary infrastructure, perpetuating a cycle of vulnerability and poverty. The dependency on remittances and the high costs associated with labor further strain the financial resources of these communities, making it difficult for them to recover and rebuild after flooding events. To effectively address these constraints, it is imperative for government agencies and institutions such as the National Orientation Agency, National Emergency Management Agency (NEMA), and Nigeria Meteorological Agency (NIMET) to enhance their efforts in disseminating adequate information and providing robust support systems. Strong institutional frameworks, backed by effective policies, are crucial in ensuring that flood victims receive the necessary resources and support to rebuild their lives and livelihoods.

Table 5: Distribution of respondents by constraints to the use of coping strategies by crop farmers and artisanal fishermen

Constraints	States					
	Bayelsa		Delta		Rivers	
	F	%	F	%	F	%
Poor Knowledge of other good Strategies	167	92.7	149	90.8	97	.5
Poor Education	110	61.1	94	57.3	88	83.0
Low Capital Base	175	97.2	154	93.9	104	98.1
Poor Government Policies	145	80.5	99	60.3	94	88.6
Poor Infrastructure Environment	170	94.4	145	88.4	98	92.4
Inadequate Extension Support	164	91.1	134	81.7	95	89.6
Cultural Belief	111	61.6	158	96.3	86	81.1
Poor Care and Information on IDPs	102	85.5	146	89.0	98	92.4
Increases Health Disorder	135	75.0	106	64.6	85	80.0
Poor Access to Improved Varieties and species	142	78.8	126	70.0	93	87.7
Poor Access to Information	103	57.2	151	92.1	89	83.9
High Labour Cost	174	96.6	159	96.9	78	73.5

F = Frequency of occurrence.

Source: Field survey data (2024)

CONCLUSIONS

- Coastal flooding has unprecedented negative impacts on the livelihoods of crop farmers and fishermen in the South-South zone of Nigeria as it had led to death, loss of livelihood, increased cost of production, food scarcity, poor storage, among others.
- The crop farmers and fishermen tried to counter these impacts by adopting measures such as labour migration, seeking more information, engagement in non-farming and non-fishing activities, dependence on remittance among others irrespective of governmental efforts.

RECOMMENDATIONS

- **Enlightenment Campaigns:** Governments should intensify awareness campaigns at the onset of the rainy season using various media

platforms to provide accurate information about floods, preparedness strategies, and safety measures.

- **Capacity Building Programs:** NGOs and oil companies should organize programs to equip local populations with skills and knowledge to manage coastal flooding. These initiatives should focus on disaster risk reduction, sustainable agriculture, emergency response, and community-based adaptation strategies.
- **Construction of Dams:** Dams should be constructed in strategic locations to manage excess water during heavy rainfall, support irrigation during dry seasons, and generate electricity. These multipurpose dams can prevent downstream flooding and support local economic development.

- **Government and Institutional Support:** Comprehensive support from the government and institutional reforms are needed to aid farmers and fishermen. This includes enhancing extension services, providing affordable credit and insurance schemes, and creating supportive policies to improve community resilience.
- **Coordinated Approach and Stakeholder Collaboration:** Effective flood management requires collaboration among government agencies, NGOs, the private sector, and community organizations. Regular monitoring and evaluation should be implemented to ensure the success of interventions, with community participation prioritized in planning and execution.

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