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EVALUATION OF COMMUNITY PERCEPTION, COPING STRATEGIES AND LOCAL KNOWLEDGE ON FLOOD RISK ASSESSMENT AND FLOOD PLAIN MANAGEMENT IN OGBARU L.G.A OF ANAMBRA STATE.

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ABSTRACT

Flooding is a recurring hazard that has destroyed life and properties. The study assessed community perception, coping strategies and indigenous knowledge in flood risk assessment and flood plain management in Ogbaru Local Government Area of Anambra State. Descriptive survey research design was adopted. Data was collected through the administration of questionnaire and key informant interview. A total of 400 was administered while 387 valid questionnaire collected were used in data analysis. Findings show that flooding affects farmlands, properties, buildings, transport, economic and health services greatly and farmlands' damages have the greatest impact. About 41.1% adopted temporary relocation, followed by rising building foundations with 35.7% while some do not have any adaptive mechanisms for coping. Based on the findings of this study, the study recommended that indigenous knowledge should be combined with Geographical Information System technology for better planning in flood prediction, reduction and management of flood disasters in the study area.

Key words: Flood Risk, Community Perception and Coping Strategies

1.0. Introduction

1.1. Background of Study

Floods are considered one of the most catastrophic natural disasters on a global scale (Narendra, Setiawan, Hasan, Siregar, Pratiwi, Sukmana, Dhamawan and Nandin, 2024). In recent years, the frequency of flood disasters has been on the rise (Turkington, Breinl, Ettema, Alkema and Jetten, 2016). Such incidents markedly disturb regional functions, causing traffic bottlenecks, ecological damage, and the unfortunate possibility of casualties and property destruction (Yan, Rong, Yang, Lin and Zhang, 2024). The impacts of flooding are far reaching, affecting various aspects of society, including the economy, infrastructure, and daily life (Srivanit, Pattanasri, Phichetkunbodee, Manokeaw, Sitthikankun and Rinchumphu, 2024). Statistics show that global losses from flood disasters account for 20 percent (%) of all natural disaster-related losses (Zhou, Peng and Shi, 2019). Since the beginning of the 21st century, it has been estimated that global flood-related losses have reached approximately USD 651 billion, while the percentage of the population at risk of flooding has risen by nearly 24% (Yang, Ji, Yang, Jiang, Chen, Yan, Sun and Li,

2024). Floods can be triggered by natural events, human activities, or a combination of both, and have the potential to cause fatal injuries, displace large populations, and damage the environment (Buisan, Milano, Suson, Mostrales, Taclendo and Blasco, 2019).

In Nigeria, floods are the most frequent and severe natural hazards which have significantly affected lives and properties negatively (Olorunfemi, Komolafe, Fasinmirin, Olufayo and Akande, 2020). Flood hazard has displaced more people in the country than any other natural hazard with the population at risk estimated to be 20% (Cirella and Iyalomhe, 2018). The country has experienced several flood episodes with the 2012 flood episode being tagged the most severe and devastating flood episode ever witnessed in the country over the years (Akukwe, Krhoda and Oluko, 2020; Ezeokoli, Okolie and Aniegbuna, 2019; Okafor, 2020). The 2012 flood episode affected over 30 states in the country with an estimated total of seven million people affected and an economic loss estimate of 2.6 trillion naira (Okafor, 2020). Anambra state was among the states affected by 2012 flood disaster with the four Local Government Areas of Anambra west, Anyamelum, Anambra East and Ogbaru being the worst hit in the state (Okoli and Chiaghana, 2020).

Anambra State, located in the southeastern part of Nigeria, is characterized by its complex terrain and diverse hydrological features. The state's topography includes low-lying floodplains, river systems, and varied LULC patterns, all of which contribute to its flood susceptibility (Souissi, Zuhhri, Hammami, Msaddek, Zghibi and Dalala, 2019; Chukwuma, Okonkwo, Ojediran, Anizoba and Nwachukwu, 2021). The state's geographical location within the lower Niger River Basin further exacerbates its vulnerability to flooding, particularly during the rainy season when river levels rise significantly. Given these challenges, there is a critical need for a comprehensive flood risk assessment framework that can guide effective flood management and mitigation strategies (Ugoyibo, Enyinnaya and Souleman, 2017).

Ogbaru Local Government has continued to wreak havoc every rainy season though many of these incidences were unreported (Ezeokoli, Okolie and Aniegbuna, 2019). Onyeizugbe and Onyejiaka, (2019) attributed the major causes of flood hazard in Ogbaru Local Government Area of Anambra State to the water body present in the area, the topography of the area and human encroachment.

Furthermore, the incorporation of community/local knowledge is critical to ensuring that local flood risk maps contain essential local information and knowledge for local understanding, reducing ineffective national assumptions (Percival, Gaterell and Hutchinson, 2020).

1.2. Statement of the Problem

Flooding has become a common and severe environmental issue in Nigeria, especially in riverine and low-lying areas like Ogbaru Local Government Area of Anambra State. Records indicate that at least 20% of Nigeria's population faces flood risks each year. The frequency and intensity of these floods have grown due to climate change, rapid urbanization, and poor environmental management (Emeribeole, 2015).

Effective flood risk assessment and floodplain management does not only require geospatial data but also an understanding on how communities perceive and adapt to flood hazards , the coping strategies they employ and the indigenous knowledge they possesses in regards to flood prediction.

Furthermore, there is limited empirical evidence on the extent to which community perception, local knowledge, and indigenous coping strategies contribute to flood risk reduction and sustainable floodplain management in Ogbaru L.G.A. studies like Ezeokoli (2014) and Ajaero and Mozie (2014) focused on the causes, flood mapping, and impacts of flooding, with less attention given to community involvement in regards to flood risk management. This gap limits the development of participatory and community-based approaches that can enhance the effectiveness of flood mitigation measures.

1.3. Aim and Objectives

The aim of the study is to evaluate community perception, coping strategies and local knowledge regarding flood risk assessment and floodplain management in Ogbaru L.G.A of Anambra State.

To achieve this aim effectively, the following objectives were pursued:

1. to evaluate the community perception on the impacts of flood occurrence in the study area and;

2. to assess the coping strategies and local knowledge adopted by resident on flood occurrence within the study area.

2.0 Literature Review

2.1. Community Perception, Local Knowledge and Coping Strategies

Community-based approach refers to localized approaches wherein communities actively engage in identifying their vulnerabilities, capacities, and adaptation priorities, subsequently designing and implementing adaptive actions with varying degrees of external support (Agyabeng, Peprah, Mensah and Mensah, 2022).Wolff, French, Ilhamsyah, Sawailau and Ramirez, (2021) study on collaborating with

communities on flood monitoring cities of Indonesia using citizen science. The study found out that community participation can generate useful flood information especially in places where conventional flood data is inefficient. The researchers asserted that citizen science can provide a valuable flood monitoring data while simultaneously integrating local communities in flood risk management.

Ahmad (2019), in his article The Role of Indigenous Knowledge in Managing Floods Projects within Khursheed village, District Sargodha, Pakistan. A qualitative research approach was adopted, involving three focus group discussions and thirty in-depth interviews with local community members. This methodology allowed for a rich understanding of localized strategies and their cultural underpinnings. The study identified several indigenous practices that significantly enhance community resilience to floods. These include traditional flood forecasting based on environmental signals, resilient construction techniques, adaptive agricultural methods, and spiritual coping mechanisms that reinforce psychological preparedness. However, the study also highlights the marginalization of traditional ecological knowledge within official disaster management policies.

Okunola and Olawumi (2022) examined the determinants of household flood resilience strategies in Kaduna Metropolis. The study employed the administration of questionnaire through multi stage sampling across the residential zones. The study found out that household focused more on post flood coping measures than preparedness strategies. Financial constraint, inadequate infrastructure and insufficient government supports are the major factor limiting household resilience. The researchers were of the opinion that strengthening household resilience requires adequate government support as well as effective awareness on flood resilience strategies.

2.2. Conceptual Framework

2.2.1. Concept of Flood Risk

Flood risk is generally conceptualized through three fundamental components: hazard, exposure and vulnerability. (Nkwunonwo, Malcolm and Brian, 2020). Hazard refers to potential occurrence of flood event; exposure refers to the people, property, infrastructure and other assets located in areas that may be affected; vulnerability represents the characteristics that influence the susceptibility of exposed elements to flood impacts (Nkwunonwo, Malcolm and Brian, 2020). Flood risk in developing countries cannot be reduced to purely hydrological phenomenon. It is simultaneously a social and institutional condition, shaped by land use patterns, poverty and inadequate drainage and early warning infrastructure (Nwogu, Victoria, Salman and Oyetunji, 2025).

2.2.2. Concept of Community-Based Approach

Community-based approach refers to localized approaches wherein communities actively engage in identifying their vulnerabilities, capacities, and adaptation priorities, subsequently designing and implementing adaptive actions with varying degrees of external support (Agyabeng, Peprah, Mensah and Mensah, 2022). In the Community-Based Disaster Risk Management (CBDRM) literature, this approach participatory and community driven approaches emphasize the involvement of local communities in identifying risks, strengthening preparedness and developing locally appropriate responses (Olawuyi, Gbadegesin, Ajayi, Oyedele, Geiger, Seidemann, Geisemann, Sansone, Nasir, Atenyi, Salako, Agada and Adaje, 2025).

2.3. Theoretical Framework

Several theories are associated with flooding disasters that can help to provide a deeper understanding of the causes, impacts and responses to these flooding events. Based on these theories, policymakers or researchers can develop a more nuanced understanding of the complex factors that contribute to flooding disasters and identify effective strategies for reducing their impact (Guddo, 2024).

2.3.1. Social Vulnerability Theory

Social vulnerability theory emphasizes that flood impacts are not determined solely by the physical characteristics of a hazard but are also shaped by social and socioeconomic conditions. Differences in poverty, access to resources, education, and coping capacity can cause some individuals and communities to experience greater impacts from flooding than others (Fox, Agyemang, Hawker and Neal, 2024). It helps to understand how certain groups of people are more vulnerable to disasters and their impacts than others due to social, economic and political factors. In the context of flooding disasters, this theory suggests that certain populations are at greater risk of experiencing negative consequences because of their social vulnerability which may include characteristics like age, gender, racial and ethnic groups, disability and socioeconomic background of individuals (Thomas, Philips, Lovekamp and Fothergril, 2013).

2.3.2. Risk Society Theory

This theory explains that modern society characterized by an increasing awareness of risk including the risks associated with flooding disasters (Van 2015). It underlines the critical need for risk assessment, management and communication while dealing with flooding disasters. Furthermore, risk society theory describes that disaster like flooding is not just a natural phenomenon but is also a byproduct of human

interactions in term of their actions and decisions (Van, 2015). It can be observed through development and expansion of urban areas into flood-prone zones as well as in the construction of heavy infrastructure like dams, which may increase the chances of flooding disasters (Van, 2015). Moreover, the concerns of unequal distribution of resources and power in society can lead certain social groups being unequally exposed to flooding risks and its worse impact. Additionally, this theory emphasizes on the importance of technology and information in the management of flooding risk through the use of flood forecasting, early warning systems and risk communication strategies (Van 2015). Overall, risk society theory recommends a holistic approach to understand the complex societal and political factors that shape the management and response to the flooding disaster.

2.2.3. Adaptive Governance Theory

This theory emphasizes the need for flexible and adaptive governance structures that can respond to the changing and uncertain conditions associated with disasters like flood (Hurlbert, 2018). Further, it emphasizes the importance of collaboration, learning and experimentation to develop effective disaster response, particularly during flooding (Hurlbert, 2018). Instead of traditional top-down approaches to governance, adaptive governance theory promotes collaborative and adaptive approach to manage flooding risks. It may require the active involvement and cooperation of multiple stakeholders like community volunteers, Government agencies, non-government agencies and private actors to deal effectively with the dynamic and uncertain nature of flooding risk (Hurlbert, 2018). Further, it stresses more on the significance of building relationships of trust and collaboration among these stakeholders to develop more flexible and adaptive governance systems (Munene, Swartling and Thomalla, 2018). Effective management of flooding disaster needs attention on both short-term and long-term consequences. It includes consideration of the immediate impacts of flooding like damage to public infrastructure and loss of life as well as longer-term impacts like changes in land use and physical environment (Munene *et al.,* 2018).

2.3.4.. Disaster Risk Reduction (DRR) Theory

It is the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risk throughout the society and the adverse impact of hazards within the broad context of sustainable development (Joan, 2020). The DRR suggests that once we are successful in sustainable development efforts, we will greatly reduce the risk of disaster. This can be done by developing the flood hazard and risk profiles which can be used to design appropriate measures to manage and mitigate the floods and build peoples adaptation capacity and resilience (Joan, 2020).

3.0. Study Area

Ogbaru Local Government Area is one of the 21 Local Governments in Anambra State, Nigeria (fig, 3.2). Geographically it is located at Latitudes 5^0 42' N and 6^0 08' N and Longitudes 6^0 42' E and 6^0 50' E. The study area (fig.3.3) is surrounded by the River Niger in such a way that most of the communities are located at the bank of the river (Ezeokoli, Okoye and Ugochukwu, 2015). The towns that make up the Local Government includes; Atani, Akili-Ogidi, Akili-Ozizor, Amiyi, Mkputu, Obagwe, Ohita, Odekpe, Ogbakugba, Ochuche Umuodu, Ossomala, Ogwu-Aniocha, Umunankwo, Umuzu, Okpoko and Ogwu-Ikpele with the headquarters at Atani. To the North, the study area is bounded by Onitsha South, Idemili North and South Local Government Areas in Anambra State, to the South, it is bounded Imo and River States, to the East it bounded by Ekwusigo and Ihiala Local Government Area of Anambra State, and to the west, it is bounded by River Niger and Delta State (Ezeokoli *et al.,* 2015). The study area has flat and low-lying topography with a slope angle of 1-3^0. Thus some of the communities are flooded for over 8 months in a year (Ajaero and Mozie, 2014). The relief is a plain land of height ranging between 0-50m and it is characterized by swampy conditions due to its alluvial mud content (Ezenwaji, Orji, Enete and Ahiadu, 2014). The study area has two major Rivers, River Niger and Ulasi River which is a major tributary, though there are creeks and ponds all over the landscape (Ezenwaji *et al.,* 2014). The water of the aquifer is quite shallow with the average elevation of 25m above sea level (Ezenwaji *et al.,* 2014). The average climatic conditions of the study area are wet season which starts from March to October and dry season which starts from November to February. The highest rainfall is recorded from June to September. The average annual rainfall ranges from 1800mm to 2000mm. it has a mean annual temperature as 30^0C and 27^0C respectively. The average relative humidity ranges between 60%-70% in January and 80%-90% in July (Onyido, Ebonighe, Ozumba, Ikpeze, Obiukwu and Amadi, 2011). Ogbaru floods during the rainy season and dries up during the dry season though the flood lasts for a long time before receding. The vegetation is a mixture of fringing forests along the banks of the River Niger and Guinea Savannah in the hinterland (Ezenwaji *et al.,* 2014). Ogbaru lies on the sedimentary basin; the terrain in Ogbaru is predominantly flat and low-lying with extensive floodplains. The geology of Ogbaru is characterized by alluvial deposits from River Niger, consisting of sand, silt and clay (Ezeokoli *et al,* 2015).

The population of the study according to the 2006, National Population and Housing Census was 223,317 with the population projection, in 2025; the population of Ogbaru L.G.A of Anambra State was projected to be 342,166.



Figure 3.1. Map of Nigeria showing Anambra State

Source: Department of Surveying and Geo-Informatics, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria (2024).

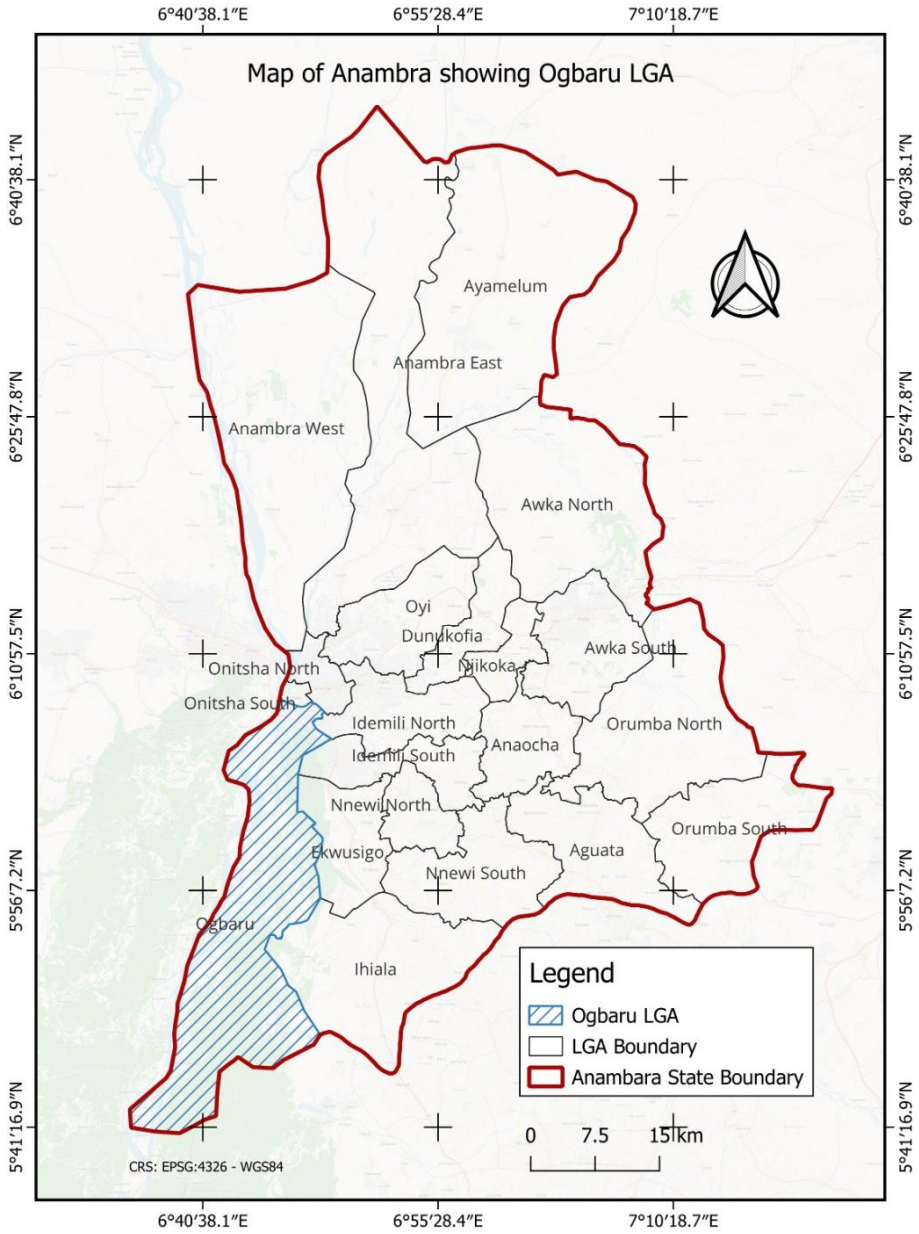


Figure 3.2: Map of Anambra State showing Ogbaru L.G.A.

Source : Department of Geography, University of Jos(2026).

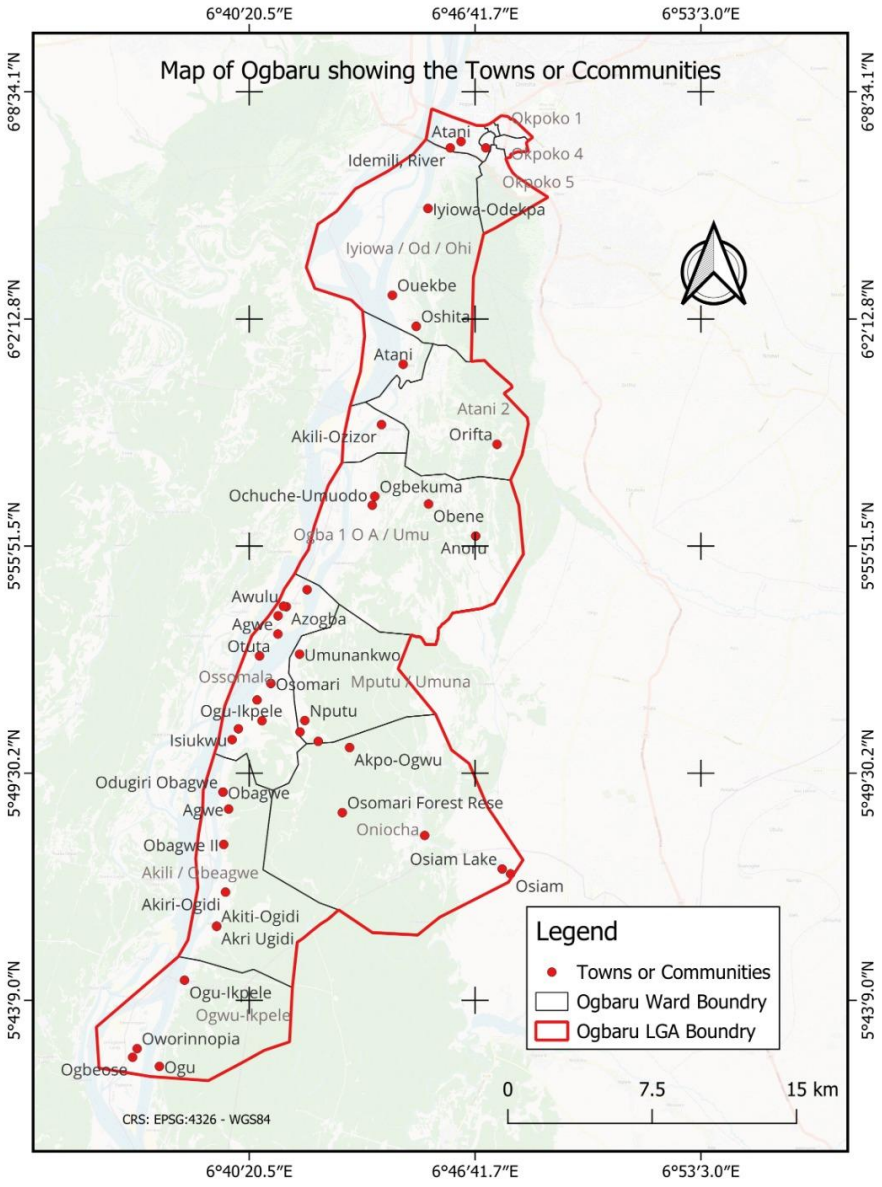


Figure 3.3: Map of Ogbaru Local Government Area Showing the Study Area

Source : Department of Geography, University of Jos(2026).

3.2. Methodology

The study adopted a descriptive survey such as adminstration of questionnaire and key informant interview. 400 questionnaires were distributed across six communities that records high flood risk occurrence as sample size, using the target population. These communities included; Atani, Odekpe, Ossomala, Ogwu-Aniocha, Obeagwe and Ogwu-Ikpele. 387 questionnaires were returned which was used

in data presentation. Key informant interview were conducted to stake holders such as Government officials,local communities and community leaders.

4.0. Data Presentation and Discussion of Findings

4.1. Data Presentation

Table 4.1: Demographic Characteristics of Respondents

Age	Frequency	Percentage %
18-24 years	32	8.3
25-34 years	88	22.7
35-44 years	74	19.1
45-54 years	117	30.2
55 and above	76	19.6
	387	100

Gender	Frequency	Percentage %
Male	224	57.9
Female	163	42.1

Educational level	Frequency	Percentage %
Primary Education	69	17.8
Secondary Education	172	44.4
Tertiary Education	126	32.6
No Formal Education	20	5.2
Total	387	100

Town of Residence	Frequency	Percentage %
Atani	75	19.4
Odekpe	75	19.4
Obeagwe	60	15.5
Ossomala	70	18.1
Ogwu-Ikpele	52	13.4
Ogwu Aniocha	55	14.2

Occupation	Frequency	Percentage %
Farming	60	15.5
Fishing	10	2.6
Trading	190	49.1
Civil service	50	12.9
Others	77	19.9
Total	382	100

Length of Residence	Frequency	Percentage %
Less than 5yrs	130	33.6
More than 5yrs	257	66.4

Table 4.1 presents the demographic characteristics of the 387 respondents selected from the flood-prone communities of Ogbaru Local Government Area. The demographic profile is important because it provides insight into the respondents' ability to provide reliable information on flood occurrence, vulnerability, coping strategies, and sustainable floodplain management.

i. Age Distribution

The age distribution shows that respondents from the age of 45-54 years constituted the largest group with 117 respondents (30.2%)**,** followed by those from the age of 25-34 years with 88 respondents (22.7%)**,** 55 years and above with 76 respondents (19.6%)**,** 35-44 years with 74 respondents (19.1%)**,** while respondents from the age of 18–24 years accounted for only 32 respondents (8.3%)**.** This indicates that the majority of respondents were mature adults who are economically active and have considerable experience living within the flood-prone environment of Ogbaru.

ii. Gender Distribution

The gender distribution reveals that 224(57.9%) respondents were male while 163(42.1%) respondents were female**.** This implies that there are more male than female in the study area.

iii. Education Qualification

The educational qualification shows that 126 respondents (32.6%) had tertiary education**,** 172 respondents (44.4%) had secondary education**,** and 69 respondents (17.8%) had primary education**,** while only 20 respondents (5.2%) had no formal education**.** This indicates that respondents are learned and has knowledge of flood occurrence or events.

iv. Town of Residence

The distribution of respondents across the selected communities shows that Atani and Odekpe each accounted for 75(19.4%) respondents**,** Ossomala had 70(18.1%) respondents**,** Obeagwe had 60 (15.5%) respondents**,** Ogwu-aniocha had 55 (14.2%) respondents**,** while Ogwu-ikpele had 52 (13.4%) respondents**.** This indicates that the study captured opinions from all major flood-prone communities selected for the study.

v. Occupation of Respondent

The occupational distribution reveals that trading was the dominant occupation with 190 (49.1%) respondents**,** followed by others with 77 (19.9%) respondents**,** farming with 60 (15.5%)**,** respondents, civil service with 50 (12.9%) respondents**,** and fishing with 10 (2.6%) respondents**.** This implies that trading and farming are the major source of livelihood in the study area.

vi. Length of Residence

From the findings in (Table 4.1) shows that 257 participants (66.4%) are individuals who have stayed in the area for over five years, while 130 participants (33.6%) are individuals who have stayed in the area for less than five years. It is important to note that this result is very significant, as it implies that most of the respondents have extensive experience in environmental conditions and flooding in the research area. Extensive experience in an area implies that individuals have indigenous knowledge about flooding and ways of dealing with floods. The results show that 257 (66.4%) respondents had lived in the area for more than five years**,** while 130 (33.6%) respondents had lived in the area for less than five years. This indicates that the majority of respondents have long-term experience of flood event in the study area can give an adequate and reliable information on the history of flood risk in the study area.

Table 4.2. How would you rate your level of awareness of flood risk in your community?

Level of Awareness	Frequency	Percentage %
Very High	157	40.6
High	148	38.2
Moderate	54	13.9
Low	15	3.87
Very Low	13	3.34
Total	387	100

Source: Researchers Field Work

Table 4.2 shows the level of awareness to flood risk in Ogbaru Local Government Area. The result shows that very high and high has the highest number of respondent of 157(40.6%) and 148(38.2) respectively, while moderate, low and very low recorded 54(13.9%), 15(3.87%) and 13(3.34%). This implies that the respondents has high level of awareness to flood risk and also understands the implication to flood risk.

Table 4.3. What local knowledge helps you predict flood risk in your community?

Local Knowledge	Frequency	Percentage %
Rising Water Level	100	25.8
Change in River Colour	69	17.8
Increase in River Flow	112	28.9
Prolonged Rainfall	50	12.9
Previous Flood Pattern	42	10.9
Change in Weather	14	3.61
Total	387	100

Source: Researchers Field Work

Table 4.3 present the local knowledge adopted by respondents on flood risk prediction in Ogbaru L.G.A. The results show that increase in river flow is the most commonly identified local indicator with 112(28.94%) responses. This implies that changes in the velocity of river flow are one of the significant signals adopted by respondent in flood risk prediction. Rising water level is the second highest indicator with 100(25.83%) responses. This shows that respondents closely monitor the rise in water level as early sign of flood event. Change in river colour had 69(17.82%), prolonged rainfall had 50(12.91%) while previous flood pattern had 42(10.85%). Change in weather having the lowest response with 14(3.61%). This indicates that the respondents possess practical and experience knowledge in identifying early sign of flooding.

Table 4.4: What are your main coping strategies during flood risk?

Coping Strategies	Frequency	Percentage %
Temporary Relocation	159	41.1
Raising Building Level	138	35.7
Planting of Vegetation	20	5.17
Clearing of Drains	58	14.9
None	12	3.10
Total	387	100

Source: Researchers Field Work

Table 4.4 shows temporary relocation with 159(41.1%) respondents is the most dominant coping strategy, while raising building level recorded 139(35.7%), planting of vegetation with 20(5.1%) respondents, clearing of drains recorded 58(14.9%). It reflects the severity and regularity of flooding in Ogbaru, where inundation is so intense and prolonged that many households have no choice but to physically vacate their homes during flood seasons. This finding is consistent with the flood risk mapping results in the same study, which showed that 66.67% of settlements fall within high and very high flood risk zones. Temporary relocation, while a rational short-term response, is not a sustainable solution, it disrupts livelihoods, access to markets, schools, and health facilities, and places enormous emotional and economic stress on affected households. Raising building level reported by 35.7% is the second most common strategy involving the elevation of the physical structure of homes to reduce flood damage. This is a structural, in-situ adaptation that allows households to remain in their communities while attempting to protect their property. It reflects a strong attachment to place among residents, who prefer to modify their environment rather than leave. However, this strategy is expensive and largely dependent on individual financial capacity, meaning poorer households are less able to adopt it, deepening socioeconomic inequality in flood resilience. A smaller but notable proportion of respondents with 14.9%

engage in clearing drainage channels as a flood coping measure. This is a proactive, community-level action that addresses one of the documented root causes of flooding in the area blocked and poorly maintained drainage systems. While beneficial, it is largely informal and reactive, typically done just before or during the rainy season rather than as part of a systematic, government-coordinated drainage management programme. Only a small fraction of 5.17 % respondents use vegetation planting as a coping strategy, despite its well-documented role in enhancing infiltration, stabilizing soils, and reducing surface runoff. This low uptake may reflect limited awareness of its benefits, the long-term nature of its effectiveness, or the immediacy of flood threats that make residents gravitate toward faster, more visible solutions. 3.10% respondents reported having no coping strategy at all. This is particularly concerning as it indicates a segment of the population that is entirely exposed and unprepared, possibly due to poverty, lack of awareness, fatalism, or limited access to resources and support networks.

Interview presentation

The interviews conducted with relevant stake holders such as government officials, community leaders and local residents showed that flooding is a regular environmental issue in Ogbaru L.G.A. It happens every year from June to September and slowly recedes by November. The respondents mentioned that severe floods often force residents to temporarily move to nearby communities and Internally Displaced Persons (IDP) camps. Government agencies and private individuals supply relief items like food, clothing, medical supplies, and financial support to help affected people during flooding events. Community leaders raised concerns about the ongoing nature of flooding and its impact on local communities. They noted that although government attempts to fully stop flooding have seen limited success, community leaders play an essential role in managing flood risks by creating awareness and sharing information. Through meetings, public announcements, and media, they teach residents about flood preparedness, evacuation procedures, and other safety measures. Residents reported that annual flooding greatly disrupts their economic activities, including farming, trading, fishing, transportation, and other daily tasks. Some households temporarily move to safer areas during severe floods, while others stay and try to carry on with their routines despite the challenging conditions. The findings suggest that flooding continues to cause significant economic and social difficulties for impacted communities. To deal with ongoing floods, residents use different strategies. They raise building foundations with concrete materials and adjust farming schedules to avoid the worst flood times. The respondents also said that flood warnings come from agencies like NEMA and SEMA, which provide early warnings to at-risk communities. These findings highlight the need to combine community knowledge, local experiences, and geographic information to improve flood risk assessment, disaster preparation, and sustainable floodplain management in Ogbaru L.G.A.

4.2. Discussion of Findings

The study assessed community perceptions, coping strategies and indigenous knowledge relating to flood risk in Ogbaru L.G.A. The survey and key informant interviews revealed that flooding is a recurring annual event, occurring predominantly between June and September. The findings further showed that temporary relocation (41.7%) and raising of building floors (41.7%) were among the major coping mechanisms reported by residents. Community leaders and mass media were also identified as important sources of flood warning information.

These findings are consistent with the Social Vulnerability and Risk Society theories. These theories recognize that the consequences of flood events are influenced not only by the physical characteristics of the hazard but also by social, institutional and economic conditions, including access to information, early warning systems and resources for preparedness and response. The dependence of residents on government in the dissemination of information through NEMA and SEMA is related with the findings of Ahadzie, Dinye, Dinye and Proverbs (2016) in Kumasi, Ghana. Their study found that residents were aware of their exposure to flooding but lacked systematic community based strategies and consequently depended substantially on external government support. The predominance of reactive coping mechanisms in Ogbaru, particularly temporary relocation and post flood recovery of agricultural activities, is consistent with findings from Okeleye, Olorunfemi, Sogbedji and Aziadekey (2016), Okunola and Olawumi (2022), and Berezi and Nwankwoala (2022) who reported that flood prone communities tend to rely more heavily on post disaster coping measures than on anticipatory preparedness. These studies associated this pattern with inadequate early warning system and limited institutional support. The findings from Ogbaru therefore suggest that although residents have developed practical ways of responding to recurring flood events, these strategies remain largely reactive.

Furthermore, the study identified the relevance of indigenous knowledge in local flood risk awareness. Respondents reported using environmental indicators such as rising water levels and changes in river flow, in predicting flood events. This finding is consistent with Bwambale, Muhumuza and Nyeko (2019) and Abdullahi, Abdussalam and Odeh (2022), who documented similar reliance on traditional ecological knowledge in Uganda and Adamawa State, respectively. However, these studies also highlighted that indigenous knowledge is frequently excluded from formal, government led flood management systems.

5.0. Conclusion and Recommendations

5.1. Conclusion

In conclusion, flooding is a recurring environmental hazard in Ogbaru L.G.A which has caused significant impacts on livelihood, infrastructures, agricultural activities and the well being of residents. They findings from this study show that local communities have local knowledge that contribute to the prediction of flood occurrence and also support flood preparedness. Residents have developed various coping mechanisms such as temporary relocation and raising of building foundation to help reduce flood impacts. However, these measures are not sustainable; therefore effective floodplain management requires integration of community knowledge, stakeholder involvement and geospatial information in developing sustainable floodplain management strategies.

5.2. Recommendations

i. Government agencies should improve flood early warning systems and provide adequate timely flood information to vulnerable communities.

ii. Community-based flood management programmes should be encouraged to incorporate indigenous knowledge and local experiences into flood risk assessment and planning.

iii. Drainage channels, embankments and other flood control structures should be constructed and maintained effectively to reduce flood impacts.

iv. Public awareness campaigns and regular training programmes should be organized to improve residents' preparedness and response to flood disasters.

REFERENCES

Abdullahi, J., Abdussalam, B., and Odeh, C. E. (2022). Assessment of indigenous knowledge of flood risk reduction in Guyuk Local Government Area, Adamawa State, Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences, 8*(2), 1–14.

Agyabeng, A. N., Peprah, A. A., Mensah, J. K., and Mensah, E. A. (2022). Informal settlement and urban development discourse in the Global South: Evidence from Ghana. *Norsk Geografisk Tidsskrift, 76*(4), 242-253.

Ahadzie, D. K., Dinye, I., Dinye, R. D., and Proverbs, D. (2016). Flood risk perception, coping and management in two vulnerable communities in Kumasi, Ghana. *International Journal of Safety and Security Engineering, 6*(3), 538–549. https://doi.org/10.2495/SAFE-V6-N3-538-549

Ahmad, M. (2019). Role of indigenous knowledge in managing floods projects. *Advances in Social Sciences Research Journal, 6*(6), 354–362. https://doi.org/10.14738/assrj.66.6635

Ajaero, C. K., and Mozie, A. T. (2014). Socio-demographic differentials in vulnerability to flood disasters in rural southeastern Nigeria. Paper presented at the *International Seminar on Demographic Differential Vulnerability to Natural Disasters in the Context of Climate Change Adaptation*, Khao Lak, Thailand

Akukwe, T. I., Oluoko-Odingo, A. A., and Krhoda, G. O. (2020). Do floods affect food security? A before-and-after comparative study of flood-affected households' food security status in South-Eastern Nigeria. *Bulletin of Geography. Socio-economic Series, 47*(47), 115–131. https://doi.org/10.2478/bog-2020-0007

Buisan, Z. A., Milano, A. E., Suson, P. D., Mostrales, D. S., Taclendo, C. S., and Blasco, J. G. (2019). The impact of sound land use management to reduce runoff. *Global Journal of Environmental Science and Management, 5*(4), 399–414. https://doi.org/10.22034/GJESM.2019.04.01

Bwambale, B., Muhumuza, M., and Nyeko, M. (2019). Traditional ecological knowledge and flood risk management: A preliminary case study of the Rwenzori. *Jàmbá: Journal of Disaster Risk Studies, 11*(1), 589. https://doi.org/10.4102/jamba.v11i1.589

Chukwuma, E. C., Okonkwo, C. C., Ojediran, J. O., Anizoba, D. C., Ubah, J. I., and Nwachukwu, C. P. (2021). A GIS based flood vulnerability modelling of Anambra State using an integrated IVFRN-DEMATEL-ANP model. *Heliyon, 7*(9), e08048. https://doi.org/10.1016/j.heliyon.2021.e08048

Cirella, G. T., and Iyalomhe, F. O. (2018). Flooding conceptual review: Sustainability-focalized best practices in Nigeria. *Applied Sciences, 8*(9), 1558. https://doi.org/10.3390/app8091558

Emeribeole, A. (2015). Managing flood disaster in Nigerian cities: Issues and strategies toward meeting modern challenges (FIG Working Week Report).

Ezenwaji, E.E., Orji, M.U., Enete, C.I. and Ahiadu, H.O., (2014). "The effect of climate change on the communities of Ogbaru Wetland of South West Anambra State, Nigeria," New *York Science Journal,* 7(10), 68 – 74.

Ezeokoli, F. O. (2014). Investigation into the post-flooding reconstruction management in Anambra State: A case study of Ogbaru L.G.A (Unpublished master's thesis). Nnamdi Azikiwe University, Awka, Nigeria.

Ezeokoli, F. O., Okolie, K. C., and Aniegbuna, A. I. (2019). The physiognomy of flooding and flood disasters in Nigeria: Stakeholders' perception of flooding events in Ogbaru, Anambra State. *Current Journal of Applied Science and Technology, 33*(6), 1–12.

Ezeokoli, F. O., Okoye, P. U., and Ugochukwu, S. C. (2015). The upshot of the 2012 flooding on structural components and fabrics of buildings at Ogbaru, Anambra State, Nigeria. *American Journal of Civil Engineering and Architecture, 3*(4), 129–136.

Fox, S., Agyemang, F., Hawker, L., and Neal, J. (2024). Integrating social vulnerability into high-resolution global flood risk mapping. *Nature Communications, 15*, 3155. https://doi.org/10.1038/s41467-024-47394-2

Guddo, S. (2024). Conceptualization of flooding disaster: A theoretical perspective of management. *Disaster Advances, 17*(2), 40–44

Hurlbert, M. A. (2018). Adaptive governance of disaster: Drought and flood in rural areas (1st ed.). *Springer.*

Joan, O. (2020). Flood crisis and socio-economic livelihood of people in Ogbaru Local Government Area of Anambra State. *International Journal of Economics, Commerce and Management, 5*(2), 604–618.

Munene, M. B., Swartling, Å. G., and Thomalla, F. (2018). Adaptive governance as a catalyst for transforming the relationship between development and disaster risk through the Sendai Framework. *International Journal of Disaster Risk Reduction, 28*, 653–663.

Munene, M. B., Swartling, Å. G., and Thomalla, F. (2018). Adaptive governance as a catalyst for transforming the relationship between development and disaster risk through the Sendai Framework. *International Journal of Disaster Risk Reduction, 28*, 653–663.

Narendra, B.H., Setiawan, O., Hasan, R.A., Siregar, C.A., Pratiwi, Sari, N., Sukmana, A.,

Dhamawan, I.W.S., and Nandini, R., (2024). Flood susceptibility mapping based on watershed geomorphometric characteristics and land use/ land cover on a small island. Global *Journal of Environmental Science and Management*, 10(4): 301-320

National Population Commision (NPC), (2006). "Population census figures for 2006", Official Gazette, Abuja.

Nkwunonwo, U. C., Whitworth, M., and Baily, B. (2020). A review of the current status of flood modelling for urban flood risk management in the developing countries. *Scientific African, 7*, e00269. https://doi.org/10.1016/j.sciaf.2020.e00269

Nwogu, N., Victoria, M. F., Salman, H., and Oyetunji, A. K. (2025). Integrating GIS into flood risk management: A Global South perspective on resilience, planning, and policy. *Water, 17*(21), 3149. https://doi.org/10.3390/w17213149

Okafor, J. C. (2020). Flood, livelihood displacement, and poverty in Nigeria: Plights of flood victims, 2012–2018. In W.Leal Filho, N.Oguge, D. Ayal, L. Adeleke, and I.da Silva (Eds), *African handbook of climate change adaptation* (pp.1-2). Springer. https://doi.org/10.1007/978-3-030-42091-8_124-1.

Okoli, O., and Chiaghana, C. (2020). Analyzing The Communicative Imperative in A before-and-after comparative study of flood-affected households' food security status in South-Eastern. *Bulletin of Geography. Socio-Economic Series*, *47*, 115–131

Okoye, P. U., Ezeokoli, F. O., and Ezeokonkwo, J. U. (2015). Building development in flood-prone areas: A case study of Ogbaru Council Area of Anambra State, Nigeria. *International Journal of Engineering Research and Applications, 5*(8), 30–40.

Olawuyi, D. A., Gbadegesin, A. S., Ajayi, D. D., Oyedele, P., Geiger, D., Seidemann, I., Geisemann, P., Sansone, S., Nasir, F., Antenyi, O. P., Salako, F., Agada, J., and Adaje, P. (2025). Anticipatory action in river flooding risk management in Nigeria: An assessment of community-level implementation. *Journal of Flood Risk Management, 18*(4), e70117. https://doi.org/10.1111/jfr3.70117

Olorunfemi, I. E., Komolafe, A. A., Fasinmirin, J. T., Olufayo, A. A., and Akande, S. O. (2020). A GIS-based assessment of the potential soil erosion and flood hazard zones in Ekiti State, Southwestern Nigeria using integrated RUSLE and HAND models. *Catena, 194*, 104725. https://doi.org/10.1016/j.catena.2020.104725

Onyeizugbe, R. U., and Onyejiaka, J. C. (2019). The effect of flood on land utilization in Ogbaru L.G.A. of Anambra State. *Environmental Review, 7*(1), 117–123.

Onyido, A. E., Ebonighe, V. O., Ozumba, N. A., Ikepze, O. O., Obiukwu, M. O., and Amadi, E. S. (2011). An investigation of the methods of self-protection against mosquito bites in Ogbaru L.G.A. of Anambra State, Nigeria. *New York Science Journal, 4*(8), 110–115.

Onyido, A. E., Ebonighe, V. O., Ozumba, N. A., Ikepze, O. O., Obiukwu, M. O., & Amadi, E. S. (2011). An investigation of the methods of self-protection against mosquito bites in Ogbaru L.G.A. of Anambra State, Nigeria. *New York Science Journal, 4*(8), 110–115.

Percival, S. E., Gaterell, M., and Hutchinson, D. (2020). Effective flood risk visualisation. *Natural Hazards, 104*(1), 375–396. https://doi.org/10.1007/s11069-020-04173-8

Souissi, D., Zouhri, L., Hammami, S., Msaddek, M. H., Zghibi, A., and Dlala, M. (2019). GIS-based MCDM-AHP modeling for flood susceptibility mapping of arid areas, southeastern Tunisia. *Geocarto International, 35*(9), 991–1017. https://doi.org/10.1080/10106049.2019.1566405

Srivanit, M., Pattanasri, S., Phichetkunbodee, N., Manokeaw, S., Sitthikankun, S., and Rinchumphu, D. (2024). Analysis of sensitive urban form indicators of flood susceptible prediction based on machine learning models. *Global Journal of Environmental Science and Management, 10*(4), 1501–1518

Thomas, D. S. K., Phillips, B. D., Lovekamp, W. E., and Fothergill, A. (2013). Social vulnerability to disasters (2nd ed.). *CRC Press.*

Turkington, T., Breinl, K., Ettema, J., Alkema, D., and Jetten, V. (2016). A new flood type classification method for use in climate change impact studies. *Weather and Climate Extremes, 14*, 1–16. https://doi.org/10.1016/j.wace.2016.10.001

Ugoyibo, O. V., Enyinnaya, O. C., and Souleman, L. (2017). Spatial assessment of flood vulnerability in Anambra East Local Government Area, Nigeria using GIS and remote sensing. *British Journal of Applied Science & Technology, 19*(5), 1–11.

Van Voorst, R. (2015). Applying the risk society thesis within the context of flood risk and poverty in Jakarta, Indonesia. *Health, Risk & Society, 17*(3), 246–262.

Wolff, E., French, M., Ilhamsyah, N., Sawailau, M. J., and Ramírez-Lovering, D. (2021). Collaborating with communities: Citizen science flood monitoring in urban informal settlements. *Urban Planning, 6*(4), 351–364.

Yan, L., Rong, H., Yang, W., Lin, J., and Zheng, C. (2024). A novel integrated urban flood risk assessment approach based on one-two dimensional coupled hydrodynamic model and improved projection pursuit method. *Journal of Environmental Management, 366*, 121910.

Yang, L., Ji, X., Li, M., Yang, P., Jiang, W., Chen, L., Yang, C., Sun, C., and Li, Y. (2024). A comprehensive framework for assessing the spatial drivers of flood disasters using an optimal parameter-based geographical detector–machine learning coupled model. *Geoscience Frontiers, 15*(6), 101889.

Zhou, Y., Peng, T., and Shi, R. (2019). Research progress on risk assessment of heavy rainfall and flood disasters in China. *Torrential Rain and Disasters, 38*(5), 494–501.