

# Leadership Roles in Mitigating Flood-Induced Displacement in Patigi Kwara State Nigeria

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## Abstract

Floods can happen in a multitude of ways when rivers overflow their banks due to excessive rain, or a ruptured dam upstream, which often causes damage to homes and businesses. Flood mitigation can be adopted to reduce the overall risk of flood damage. The objectives of the study were to investigate the risk on the well-being of flood-induced displaced residents in Patigi Kwara State, Nigeria, examine their coping strategies and identify leadership roles in flood disaster mitigation in the study area. Disaster Risk Management Approach promoted by the United Nations in 2005, being the systematic development approach to minimize vulnerabilities within the broad context of sustainable development theory was used. Both primary and secondary data sources of quantitative and qualitative designs were utilized. Purposive sampling was used to identify the respondents. In-depth interview technique was adopted to elicit data from the participants. Twenty-five (25) victims of flood disasters in Patigi community, ten (10) officials of recognized NGOs, five (5) government officials who understood government's efforts, fifteen (15) flood disaster experts and 40 victims of flood disaster were selected and their responses analysed. The study found that, floods in Patigi community have caused significant loss of farmlands and destroyed many crops, livestock farming and fishery, worsening the level of hunger, which had serious implications on achieving food security. The coping strategy of victims includes living in camps in sub-standard houses and on grossly inadequate relief materials from government and agencies. The study in its recommendations identified the important leadership roles of the government in dredging the Patigi river tributaries, improve its early warning system, provide efficient spatial planning and sustainable drainage systems combined with ICT/technological tools.

## Keywords

Flood-Induced Displacement, Leadership Roles, Flood Mitigation,

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Patigi Kwara State Nigeria

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## 1. Introduction

Flood is a high-water stage in which water overflows its natural or artificial banks onto normally dry land, such as a river inundating its floodplain (*Britannica* 2024). Flood disaster is a risk caused by overflow of water, which submerges land that is usually dry and it is a natural hazard. *Cambridge Dictionary* (2024) defined risk as something that could cause a problem or loss. Natural hazards are naturally-occurring physical phenomena caused by either the rapid or slow onset of events having atmospheric, geologic and hydrologic origins on solar, global, regional, national or local scales (*UNESCO*, 2024). Disasters often follow natural hazards and they are a result of the combination of hazards, the conditions of vulnerability and of the insufficient capacity or measures to reduce the potentially negative consequences of the hazard (*UNESCO*, 2024). Flooding is a natural hazard and the effects on human well-being range from unqualified blessings to catastrophes. Floods can happen in a multitude of ways when rivers overflow their banks due to excessive rain, or a ruptured dam upstream, etc. (*Huang*, 2023). This often causes damage to homes and businesses, if they are located within the flood zones or floodplains. It is a phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, environmental damage, among others (*Huang*, 2023).

To address this natural disaster, *Nebraska* (2024) noted that flood mitigation, which reduces the overall risk of flood damage, and also reduces the severity of flood damage when it occurs can be adopted. The author identified examples of mitigation in a community to include planning and zoning, floodplain management, discouraging development in high risk flood areas, or providing outreach and education. *Nebraska* (2024) also mentioned two types of mitigation-being structural and non-structural. According to the author, structural mitigation projects aim to divert water away from people and communities, examples include dams, floodwalls, jetties, retention ponds, etc; while the purpose of non-structural flood mitigation is to change the way that people interact with the floodplain, flood risk, and also aim to move people away from flood-prone areas. Projects may include maintaining floodplain as open space, elevating structures, and in-depth community flood planning. Some of these efforts have been identified to cause displacement.

According to *Ghimire, Ferreira and Dorfman* (2015), catastrophic natural disasters like flooding are important drivers of displacement. It is estimated that during 2008-2011 more than 87 million people were displaced by extreme weather events, with almost all of these displacements happening in economically weak and corrupt states. According to the 2023 report by the *New Security Beat* (2024), around 61 million people were forced to move within their country of residence

during 2022 due to conflict or disasters. More than one quarter of these—19.2 million people—were displaced by floods Buhaug & Vestby (2024) noted that severe flooding is a major cause of human displacement and that being able to predict the levels of flood displacement may help create more effective responses, especially in key areas such as lowering the risks of exposure to such events and acquiring the mobility to evade or escape them. The authors also noted that the global pattern in flooding also varies over time. There was a steep increase in flood disasters from 1985 until the early 2000s, after which time the trend has reversed. The volume of flood displacements has also dropped in recent decades, despite population growth and climate change contributing to rising frequency and severity of extreme weather events in many parts of the world Buhaug & Vestby (2024).

Britannica (2024) reported that globally, uncontrollable floods likely to cause considerable damage commonly result from excessive rainfall over brief periods of time, as, for example, the floods of Paris (1658 and 1910), of Warsaw (1861 and 1964), of Frankfurt am Main (1854 and 1930), and of Rome (1530 and 1557).

Nigeria recorded its first flood in 1948 in Ibadan, capital of Oyo state. Since then, the menace has spread like wild fire to other states of the federation. More than half of the thirty-six states in Nigeria have been hit by one form of flood or another (Adeoye et al., 2009), that occur along the Rivers Niger and Benue. Some of the states that have been badly hit by floods include Kano, Niger, Jigawa, Kaduna, Adamawa, Benue, Kogi and many others in the southern parts of Nigeria. In August 2001, thousands of people were displaced in Kano and Jigawa States as a result of flood that was caused by the overflowing of Rivers Challawa and Kano (Adeoye et al., 2009). Twenty people were reported dead in Kano while 180 others were reported dead in Jigawa state. Four years later, precisely in August, 2005, the worst floods in forty years occurred in the northern city of Jalingo, the capital of Taraba State, after a heavy down pour of rain that lasted for eight hours, over 100 people were killed in the event and thousands of others displaced (Jeb and Aggarwal, 2008). In 2010, dam failures as well as opening of flood gates and torrential rains all contributed to flooding in some northern states in Nigeria. Over 2 million people and 5000 villages were affected and about 50,000 families were left homeless (National Aeronautics and Space Administration [NASA], 2011).

Recently, specifically on 9 September 2024, Maiduguri Borno State Nigeria was affected by a massive flood due to the collapse of Alau dam in the neighbouring Konduga LGA, climate variability and human-induced factors in addition to the continuous heavy rainfall—*as temperatures rise there was increased rainfall, leading to higher water volumes in rivers and channels*. The floods have caused extensive damage to infrastructure, crops, and shelters, severely affecting livelihoods and displacing many households. Homes, institutions, government agencies, and other businesses have been submerged in the flood, leading to increased displacement (Punch Newspaper, 2024).

In addition, according to IOM (2024), in the 19 local government areas (LGAs) of Borno State that were assessed, DTM identified 320,791 individuals in 65,731

households affected by the floods. These individuals included IDPs displaced by the floods and residents impacted by the floods but remained in their communities.

In Kwara State Nigeria, geographical placement of Patigi made it flood-prone because it is surrounded by a large River and its saturated nature (being a wetland), compounded by the general rise in the sea level as a result of global warming. Also, floods occur in many communities in Patigi because of excess rainfall, causing the river to overflow with its adverse consequences on the well-being of the affected people (Abowei & Sikoki, 2005). For instance, flooding disasters in many communities in Patigi Local Government Area had claimed many lives, caused large-scale displacement of people and destroyed properties worth millions of Naira. It has also destroyed both built environment and underdeveloped plans (Etuonovbe, 2011).

It has been found that the causes of flooding in Nigeria include, climate change (the high volume of rains has generated excessive flooding than before); consequence of human-nature interactions; lack of or poorly planned drainage systems (Ogundele & Jegede, 2011); poor waste management—indiscriminate dumping of refuse on existing drainage channels causing blockages of drainage systems in urban African societies. In most African countries, there is poor drainage system and consequently, natural drainage channels are extensively used. As reported by Nabegu (2014), people in the developing countries are fun of constructing buildings and other infrastructures on natural drainage channels. These activities disrupt the free flow of water, and this often results in flooding (Etuonovbe, 2011).

As noted by Satterthwaite (2017), flooding can be controlled with proper planning and the provision of necessary infrastructure. Ouikotan, Der-Kwast, Mynett, & Afouda (2017) stressed that efficient and proper spatial planning and infrastructure would assist in mitigating flooding and its adverse socio-economic impacts. In other words, designing and implementing Food Risk Management (FRM) strategies would help in controlling the problem of flooding in Nigeria (Acheampong, 2019; Ouikotan et al., 2017). Ogbonna, Okoro and Osuagwu (2017) in their study collected flood data for the application of Flood Routing Models for Flood Mitigation in Orashi River, South-East Nigeria and subjected it to statistical analysis. The study recommended that dredging of the river should be carried out to achieve the designed capacity. This would eliminate the risk of flooding. The results of the study will serve useful purposes in predicting flood events and design of flood control works in similar basins.

In taking leadership role to mitigate flooding, the federal government of Nigeria has invested millions of dollars both on relief and compensation as well as rehabilitation of flooded areas, yet the menace is still unabated (Jeb and Aggarwal, 2008). These days, flooding events are more rampant in urban cities in Nigeria than in the rural areas. It is fast becoming a serious environmental problem resulting in huge loss of lives, property and priceless arable land. Therefore, the aim of this study was to investigate the well-being of victims of flooding, their coping strategies and government leadership roles in mitigating the effect of flood-

induced displacement in Patigi Local Government Area of Kwara State.

## 2. Conceptual Clarifications

### 2.1. Flood Mitigation

Flood mitigation involves the management and control of flood water movement due to a rainfall event. The prevention and mitigation of flooding can be studied on three levels: individual properties; small communities, and whole towns or cities. To mitigate floods, first we must identify the locations of floodplain, and then design the flood plain (flood frequency) (Huang, 2023). Depending on locality and the nature of the flooding, a number of structural and non-structural mitigation measures may be available, Northern Territory Government (2024) has noted that flood mitigation measures may only lessen the impact of flooding and that no amount of intervention can stop heavy rain or high tides. For example, in Thailand, the government is scrambling to mitigate the effects of potential climate change, by constructing a municipal canal network up to 2600 km with pumping stations and eight underground tunnels to evacuate water if disaster strikes. Also, in 2017 Chulalongkorn University built a 4 ha park that was designed to drain several million liters of rainwater and redirects it so surrounding neighborhoods are not flooded, to address national concerns related to land subsidence as a result of sea level rise, climate change, flooding, storm surges, skyscrapers, compaction, and groundwater extraction for rice paddies, shrimp ponds and the drinking water and household needs of approximately 15 million people living on the Chao Phraya Delta (Olson & Kreznor, 2021).

WHO (2024) while providing intervention to victims of Borno State flooding assured the people that WHO would continue to provide critical technical and operational support to mitigate the health impacts of the floods, in order to strengthen disease surveillance, ensure prompt delivery of medical supplies, and prevent outbreaks of waterborne diseases. Noting that, as part of its immediate response, WHO has deployed four mobile clinics to IDP camps and provided essential medicines and medical supplies, including Interagency Emergency Health Kits (IEHKs) and malaria treatments.

### 2.2. Flood-Induced Displacement

Ghimire, Ferreira and Dorfman (2015) found that large catastrophic floods intensify environmental scarcity can lead to mass displacement from affected areas. The sudden and mass influx of migrants could increase the risk of social tensions in receiving areas. They analyzed the impact of the displacement induced by large floods on civil conflict using historical data for 126 countries during 1985-2009 and found that, while the displacement caused by large floods did not ignite new conflicts, it fueled existing conflicts and that this effect was larger in developing countries and it receded with time, vanishing five years following the flood. Also, Thompson and Suzuki (2022) in a film traced the roots of Indigenous displacement by man-made flooding of two Indigenous communities displaced by a flood,

focusing on how floodwaters were diverted away from non-Indigenous regions to Indigenous communities at Lake St. Martin by Canada's colonial government. This displacement was likened to the colonial pattern of forcibly relocating Indigenous people away from their land, resources, and good life.

Similarly, WHO (2024) noted that the flooding disaster in Borno State Nigeria displaced over one million people and the impact on the lives of the affected population, especially the most vulnerable, including women, children, and the elderly significantly increased health risks such as cholera and other waterborne diseases.

### 2.3. Leadership

Leaders are individuals who guide, inspire, and influence others toward a shared vision. They embody traits like integrity, empathy, resilience, and decisiveness. Leaders not only set direction but also foster collaboration and empower team members (Pandey, 2024). Effective leadership entails communication, problem-solving, adaptability and the capacity to make difficult decisions. Leaders motivate others to achieve something new and better. Interestingly, leaders do what they do to pursue innovation, not as an obligation. They measure success by looking at the team's achievements and learning. Unlike leaders, managers do not challenge the status quo. Instead, they strive to maintain it. They evaluate success by seeing if the team has achieved what was expected. Leaders emerge in diverse settings, such as business, politics, and community organizations, driving constructive change and advancement. Thus, to reduce risk and mitigate the effects of flooding on people and communities, effective leadership which embodies traits like integrity, empathy, resilience, and decisiveness are required for problem-solving situations.

For example, in the September 2024 flooding in Borno State Nigeria, Punch Newspaper (2024) reported that the state government, being very proactive, has activated all mechanisms to salvage the flooding situation by evacuating people from affected areas and providing the needed support, and that the gravity of the damage by the flooding is beyond the State Government, hence the need for the Federal Government to immediately step in upgrading the affected dam and assisting the residents in getting the needed support. To cushion the impact of the recent flooding incidents on victims in Borno State, North-east Nigeria, the United Nations has allocated \$6 million to the state from the Nigeria Humanitarian Fund, this amounts to N9.8 billion with the present exchange rate (Premium Times, 2024). Thus, the state and federal government in Nigeria and the United Nations have demonstrated leadership roles in mitigating the effects of Borno state flooding.

## 3. Statement of the Problems

Flood disasters in Patigi community occur annually especially since 2010 and its perennial in nature. The intensity is usually high causing damages to farmland

and means of livelihood, leading to displacement of residents in the riverine areas into IDP camp or to live with other family members in the host community, thereby escalating the vulnerability of victims. Despite the seriousness of the problem of flooding in Patigi community and in Nigeria generally, there are limited legal and policy frameworks to mitigate or prevent flooding (Cirella & Iyalomhe, 2018; Okoye, 2019), as government seems insensitive to solving the problem of flooding in the country. Therefore, in addition to examining the coping strategies of flood-induced residents in Patigi, this study seeks to identify leadership roles in mitigating the impacts of flood disaster in Patigi Kwara State.

#### **4. Theoretical Framework**

Disaster Risk Management Approach promoted by the United Nations through the international Agency for Disaster Reduction-ISDR in 2005 was used to explain this study. Disaster Risk Reduction (DRR) is the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risk throughout the society and adverse impact of hazards within the broad context of sustainable development. One of the main aspects in this approach is that, disasters are not seen as events of nature by itself but the product of intricate relationships linking the natural and organizational structure of a society (UN-ISDR, 2005). Natural disasters are inevitable, no matter the amount of the study carried out and the precautions taken in this direction, the natural disasters cannot be prevented, but the efforts can always be put and be successful in reducing the impact of them on people and communities. Given the strength of the physical forces involved and the human socioeconomic interdependence on climate and environment, it is unlikely that adverse impacts from climate events will ever be totally eliminated (UNDP, 2016), but the efforts to understand and reach the grass root of disasters are, a proof for the scope of this study both at macro and micro level.

Therefore, applying DDR theory to this study, it means identifying and studying the disaster and taking appropriate actions to control or manage them are leaders responsibility. The DDR 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 people's adaptation capacity and resilience as occurring in Patigi communities and in other areas, through governmental leadership.

#### **5. Structural Flood Mitigation**

Structural flood mitigation is where physical structures are constructed or modified to reduce the impact of flooding on individual properties or whole catchments and include Infrastructure, including dams, levees, bridges and culverts. When considering structural solutions, it is important to understand the effectiveness of individual measures in terms of flood mitigation impact. For example, some works may reduce flooding to a large area by centimetres which provides minimal

benefit to a large number of homeowners that are least affected by flooding and almost no benefit to those homeowners that are worst affected. In the Borno Nigeria flooding the [Federal Ministry of Information and National Orientation \(2024\)](#) reported that long-term solutions were underway, with budgetary allocations for 2024 and 2025 specifically targeting dam rehabilitation with immediate commencement of thorough overhauling and upgrading of breached Alau Dam in Maiduguri. This effort is aimed at tackling the persistent challenges posed by the dam's overflow and delivering a permanent solution to the recurring flood disasters in the region.

### 5.1. Early Warning Systems

Early warning systems are an essential tool for risk management and disaster preparedness that help save lives and minimize the potential impact of disasters. To be effective, early warning systems need to rely on the direct participation of at-risk communities, facilitate public education and awareness of risks, disseminate messages and warnings efficiently, and help maintain a constant state of preparedness to enable early action ([Global Disaster Preparedness Centre, 2024](#)). The four core elements, where each must function efficiently for the early warning system to be successful are: risk knowledge, monitoring, response capability and warning communication. As many floods occur at night, early warning systems are extremely important in flash flooding events to provide residents with the ability to respond to impending flood waters. This may include relocating of parked vehicles, collecting pets and valuables and implementing personal emergency plans.

### 5.2. Flood Risk Management and Spatial Planning in Nigeria

Causes of flooding in Nigeria are basically natural occurrences or human-made causes. [Etuonovbe \(2011\)](#) categorised natural causes to be heavy rainfall, oceans storms and tidal waves usually along the coast, lack of lakes and silting; while human causes are burst water from main pipes, dam failures, population pressure and deforestation. To address flood disasters, leaders can adopt flood risk management and spatial planning being measures aimed at mitigating or preventing the occurrence and consequences of floods. As noted by [Schanze \(2006\)](#), a comprehensive flood risk management and spatial planning must be able to correctly predict flood hazards, likely socio-economic consequences and suggest measures for risk reduction during flooding. The measures are not fixed as they are changing based on the transient circumstances. Studies indicated that measures for managing flood risk are determined by environmental (such as features of the area and the volume of the flood as well as the type of flood risk) and socio-economic factors ([Adelekan, 2016](#); [Bubeck, Kreibich, Penning-Rowsell, Botzen, de Moel, & Klijn, 2017](#)). There may be both structural and non-structural measures. [Bubeck et al. \(2017\)](#) argued that countries should initiate and implement approaches that fit their socio-economic and geographical context.

However, it is argued that Nigeria only responds to disaster rather than working

to prevent its occurrences or to mitigating its occurrences (Cirella & Iyalomhe, 2018). However, as noted by Echendu (2022: 4-5), “reducing and addressing exposure to flood risk is now a national priority in the Nigerian government’s disaster risk management agenda”. Nonetheless, a new framework has been formulated which makes the responses to the occurrence of flooding and its associated risks more proactive rather than reactive risk management (FGN, 2013). But, Okoye (2019) stressed that government seems to lack political will to be proactive in addressing the repeated occurrences of flooding and its associated consequences. Government only releases funds for post-flood risk management rather than releasing funds to prevent flooding occurrences.

### 5.3. Challenges of Flood Management in Nigeria

While government has a number of institutions and agencies, such as the National Emergency Management Agency (NEMA), which are capable of designing policies on flood prevention and management, these institutions are incapacitated in many respects. For instance, a department in the NEMA has skilled personnel that can use Geographical Information System (GIS) to forecast flood data. Nevertheless, there is poor forecasting system of flooding in Nigeria. Although the National Meteorological Agency (NIMET) releases seasonal rainfall predictions, the circulation of these predictions and manners through which they are communicated are poor (FGN, 2013).

Similarly, there is lack of integration and coordination among government agencies and departments saddled with the responsibilities of control and management of flood in the country (Oladokun & Proverbs, 2016). It was argued that flood control and management is carried out by the state governments and there is lack of coordination among different states. Kwara state has been argued to have deficient and poor flood management and control policy because there are no measures for evaluation and early warning systems. The same is also obtainable in Lagos state (Adelekan, 2016). Similarly, there are also challenges of lack of flood data in Oyo state (Egbinola, Olaniran, & Amanambu, 2017).

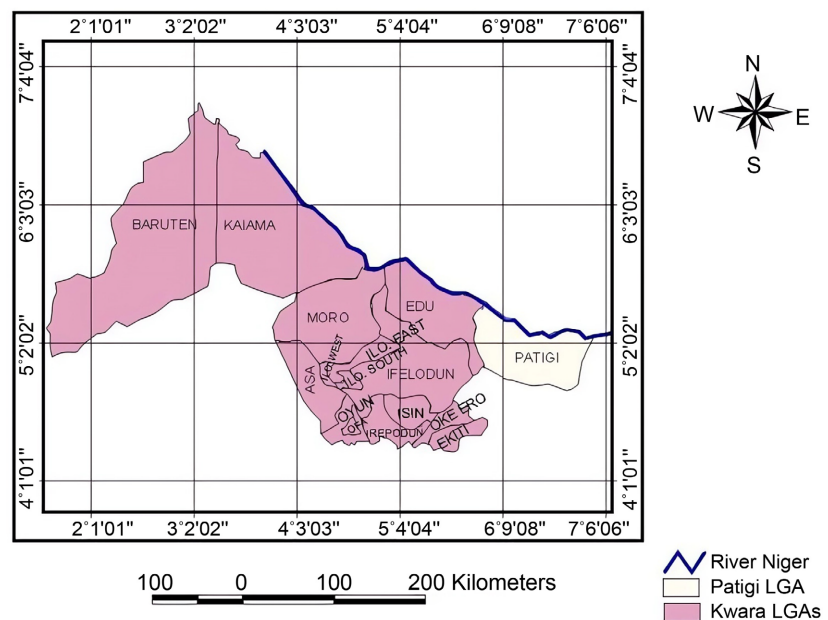
Further, floods lead to tremendous losses of property, infrastructure, business and increased risk of diseases. Olanrewaju, Chitakira, Olanrewaju, & Louw, (2019). The authors found that flood-related infectious diseases and particularly waterborne diseases and diarrhoea outbreak were predominantly associated with flood disasters. Echendu (2022) noted that flooding disrupts the schooling of children and the delivery of education in many ways and that displacements due to flooding cause children in disaster areas to become educationally disadvantaged at the crucial school age, which sets them up for continued economic disadvantage and opportunities later in life.

## 6. Study Area

### Map of Kwara State Showing Patigi LGA

Patigi is a Nupe town in Kwara State of Nigeria and the headquarters of Patigi

Local Government, it was created from Edu Local Government Area. The local government is one of the largest Fadama lowlands in the state with River Niger as the primary source of water. The Nupe people of Patigi are farmers, aquatic sellers/fishers and traders (Kwara State Government, 2020)—growing grains and they make local snacks such as “efan”, “gbankuru”, “lialia”, “Kuli-Kuli”, “dankuwa”, “banbara”, “alewa” etc. The people of Patigi also engage in fishing and are very industrious. Mineral resources such as Granite, Clay, Columbite, Gold, Quartz, Iron, Ore, and Silica also occur in large quantities. The major festivals are the Pategi Regatta festival, and the Ndakogbaya Masquerade. Tourist attractions include the Etsu Nupe palace, Duku Irrigation Scheme, and Gwasun at Egwa Mama. It has a population of 45,494 (22,712 males, 22,782 females) as of the 1991 census. It is inhabited by the Nupe people who also exhibit a linguistic repertoire of the Yoruba dialect (Kwara State Government, 2020).



**Figure 1.** Source: Kwara State Ministry of Land and Housing, 1999.

[https://www.researchgate.net/figure/Map-of-Kwara-State-showing-Patigi-LGA-Source-Kwara-State-Ministry-of-Land-and-Housing\\_fig1\\_308079047](https://www.researchgate.net/figure/Map-of-Kwara-State-showing-Patigi-LGA-Source-Kwara-State-Ministry-of-Land-and-Housing_fig1_308079047).

Patigi community as shown in **Figure 1** is prone to because of the saturated nature of the area (being a wetland) and compounded by the general rise in the sea level as a result of global warming. (Etuonovbe, 2011) noted that floods occur in many communities in Patigi because of the presence of a large river, especially when there is an excess rainfall, causing the river to overflow, claimed many lives, caused large-scale displacement of people and destroyed properties worth millions of Naira. It has also destroyed both built environment and underdeveloped plans.

## 7. Methodology

Both primary and secondary sources of data were utilised in this study. Primary

data were obtained through interviews based on the research questions. Secondary data were obtained from the official records of Department of State Security Patigi Division and Patigi Emirate Council. Both sources were used to complement each other. In-depth interview technique was utilized to elicit data from the participants to enable the researchers engage the participants and observed their feelings. The research designs were both quantitative and qualitative. The target population for this study was the entire flood-induced displaced persons who were mainly farmers, traders, students, aged among others. Purposive sampling was used to identify the respondents. A total of sixty-five (65) participants who were victims of flood disasters in Patigi community were purposively selected to understand their experiences of the flood disaster and their coping strategies. Also, ten (10) officials of the recognized NGOs based on their experiences of flood disasters were selected to know what they were doing to mitigate the consequences of flooding on the poor residents of the affected communities. Five (5) government officials were selected to understand government's narratives and efforts in curtailing the flooding disasters. Fifteen (15) flood disaster experts were selected to gain expert views on the flooding pattern in the study area.

The researchers personally conducted the field work at the flood-induced displacement camp in Patigi. Interviews were conducted in indigenous language with the help of an interpreter since Nupe is the dominant language in the study community. The participants were allowed to speak freely about the subject matters. Some participants were tape-recorded during the interview sessions, especially those that allowed recording. Those that disagreed to be tape-recorded, the researchers used jotter to jot down their responses to the questions being asked. After each interview session, researchers transcribed each response from the jotted materials and tape-recorded items, and then translated from Nupe language to English language.

## **8. Data Presentation and Analysis**

### **8.1. The Risk on the Well-Being of Flood-Induced Displaced Residents in Patigi Kwara State, Nigeria (Objective 1)**

#### **8.1.1. Food Security Was Identified as a Risk Resulting from Flooding**

One expert noted that floods are major impediment to agriculture and food security. According to him,

Many farmlands were affected especially rice and maize farms. This could lead to hike in the prices of food items in the market and serious food crisis if nothing is done to address flood disaster in Kwara State. (*Mr. Jemeel, 36-year-old Expert, Ilorin*).

From the above, analysis revealed that many hectares of rice and maize farms were washed away by flood and livestock farming and fishery disrupted. The loss of farmlands has worsened the level of hunger and starvation, especially those who had been displaced. This development has serious implications on achieving food

security in Patigi Local Government, moreso that displaced farmers and fishermen complained that the relief materials from the State Government have not been adequate, and even National Emergency Management Agency has not been responsive to their needs.

### 8.1.2. Indebtedness

A victim narrated that:

Flood washed away about six hectares of my rice farm and four hectares of my maize farm... I obtained loan from a commercial bank and used the loan to invest on the farm. Paying back the loan would be difficult for me. Where would I get the money to repay the loan? (*Mr. Sanni, 44-year-old Farmer, Ilorin*)

Result showed that some farmers obtained loans from banks to cultivate their farmlands. When their farmlands are washed away by flood they are left with nothing to harvest and sell to repay the loans and this leads to their indebtedness. Most of them suggested that government should provide soft loans to them or other financial assistance for them to start again and that supply of relief materials should be increased to cushion the effect of their losses.

### 8.1.3. Increased Poverty

An expert expressed that:

Their social capitals were disrupted, their farmlands were destroyed and their little savings were eroded as they tried to rise up again... as a result of the above, poverty has been deepened and entrenched in the affected communities in Patigi Local Government Area of Kwara State. (*Mr. Abdulkabi, 35-year-old Participant Expert, Ilorin*).

According to a traditional ruler of one of the affected communities,

The frequency of flooding in this community has further pauperized many subsistent farmers and fishermen. You know, this community is fishing and farming community. Whenever, there is flood, fish usually died and farmlands were always eroded leaving people with nothing. (*Alhaji Abdullahi, 75-year-old Participant, Community Leader*).

An Islamic cleric in Patigi explained that

Most members of the community suffer from the flood because we lost our sources of livelihoods... our farmlands and livestock are all gone. There are many poor households in this community... They become poorer after the incident because they lost the little resources they had. Their farmlands are no longer suitable for cultivation because all the soil nutrients had been washed away. (*Mallam Naseef, 49-year-old Participant, Patigi*).

The results showed that flooding in Patigi community has increased the poverty level of the people in the affected communities. Before the flood disaster, most

households were living a modest life. Flooding made them to lose almost all their means of subsistence. Most of them in camps rely on food and welfare materials from the government at all levels, relevant agencies and NGOs to survive.

#### **8.1.4. Death, Health and Well-Being of People**

More than 70 percent of the experts interviewed pointed out that flooding in Patigi had adverse impact on health and well-being of people. For instance, the majority of the participants mentioned that the floods in Patigi community have resulted in the death of some residents in the community. It was found that floods in Gbaradogi, Patigi community led to major loss of human lives. One participant who lost two of his family members to floods expressed that

It was a painful experience. Two of my children were gone missing since the last incident of flood in this community. My wife was rescued by some of our youths in this community. I was totally devastated. I am just getting over it now. Our government needs to do something urgently because the flood is getting to something else. (*Mallam Umaru, 61-year-old Participant, Patigi, Resident*).

Also, most experts argued that flood disaster is a leading cause of injury in Patigi and even elsewhere. One medical practitioner said that

The people of Patigi are highly susceptible to water-borne diseases such as dysentery, cholera and typhoid, due to their frequent exposure to flood disasters. (*Dr. Adeyemi, 39-year-old Medical Practitioner, Ilorin*).

Similarly, another health practitioner explained that

Malaria is likely to be higher in Patigi because floods breed mosquitoes and other parasites. (*Dr. Lawal, 46-year-old Medical Practitioner, Ilorin*).

Also, a medical practitioner said that

“Elderly people and children in the community are more likely to be affected... they are likely to suffer respiratory illnesses emanating from repeated exposure to floods. (*Consultant, 64-year-old Medical Practitioner, Ilorin*).

Another effect of flood disaster on health and well being according an expert is that

Flood disaster usually destroy power infrastructure resulting to power outage during floods and post-floods. When there is power outage, people may be forced to use fossil fuel-powered generators. The use of fossil fuel-powered generators may have adverse impact on their health and well-being... Deaths may result from poisoning Carbon Monoxide (CO) if there are no proper ventilation. (*Dr. Ojulari, 61-year-old Medical Practitioner, Ilorin*).

In addition, a psychologist stressed that

The experience of flood disaster could trigger the episode of post-traumatic stress disorders... A person who lost everything is likely to be depressed or even develop a suicidal thought. (*Mr. Alafara, 53-year-old Psychologist, Ilorin*).

Also, most of the participants argued that flooding adversely affects the quality of water in Patigi community. The researcher observed that after the flood disaster access to clean and adequate water supply becomes a problem. This is not unexpected because flood disaster contaminates water bodies.

The above results showed that flooding has caused deaths of many people as well as outbreak of water-borne diseases such as cholera, dysentery among others. The analysis also showed that malaria is likely to be increased following flood disaster. The researchers observed that some children and elderly people in camps visited appeared feeble and weak, which is an indication that they are suffering from one form of illness or the other, which may be connected with their experience of floods in their respective communities. In addition, their agonies and bitter experiences might also affect their mental well-being as some of the victims suffered from post-traumatic stress disorder. They appeared mentally stressed and depressed.

#### **8.1.5. Access to Quality Education**

Nearly 80 percent of the participants expressed that flood disaster affects access to education, as schools are affected by the floods and even children would be discouraged from attending schools for fear of possible flood disasters. One resident expressed that

My children have not been attending schools for some years now because their school was leveled down by the flood disaster. They are only attending informal school here in the camp... I am not really happy with this development. Government should come to our aid because this is getting out of hand. (*Mallam Ibrahim, 49-year-old Resident, Patigi*).

Similarly, a participant narrated that

When I visited my children's school after that terrible flood disaster, the whole classrooms were filled up with floods and even roads to their school have been seriously flooded... I am scared of sending my children to that school again after the whole thing have been settled because the school looks unsafe and dangerous to me. (*Alhaja Aishatu, 36-year-old Resident, Patigi*).

The study revealed that flooding in Patigi Local Government Area has denied many children access to quality education. Many children could no longer go to school because some schools in the affected communities have been submerged. In some schools, classes are filled up with floods and roads leading to schools has been flooded to the extent that their parents/guardians are afraid of allowing their children to go to schools. The researchers observed that even the schools that are not affected by the flood are used as camps for those who were displaced by the

floods.

## 8.2. Coping Strategies (Objective 2)

About 90 percent of the residents lost their homes to the floods. They reported that they were relocated to a piece of land given to them by Etsu Patigi. Most of the victims are living in houses constructed with thatches, woods and mud. One of the victims complained that they are still struggling to build new structures because the floods destroyed their crops from where they could get money. A camp resident expressed that

Flooding in this area has rendered us homeless, and we do not have enough resources to build new ones because our means of livelihoods have been destroyed. (*Alhaji Tanko, 54-year-old Participant, Patigi*).

Another victim said

The level of damages caused to our sources of living has made it extremely difficult to gather enough money to build comfortable houses. I am using this medium to persuade government of the State to help us get a permanent settlement where we can have befitting homes. (*Mallam Saliu, 54-year-old Participant, Patigi*).

In addition, an elderly resident expressed that

Not only residential houses were destroyed, but also worship centers, schools and other public infrastructures were pulled down by the flood. (*Alhaji Gambo, 87-year-old Participant, Patigi*).

One victim stressed that

The flood disaster affects the entire community. The entire community is now unsafe and unlivable as everything has been grounded. (*Mr. Muhammed, 38-year-old Participant, Patigi*).

A government official said that government has been providing relief materials to the victims in order to cushion the effect of the flood. According to him:

Kwara State Government has been responsive to the socio-economic effects of the disaster on the people of the affected communities... relief materials have been supplied to victims in their respective camps/communities such as mattresses, clothes, food items among others. Government is also planning permanent settlements for them by providing low-cost buildings for them. (*Anonymous participant, 67-year-old, Government Official*).

One expert advised that

The people of the affected communities should vacate the place or be evacuated by the state government pending the time the dredging would be completed. Even after dredging, they should be careful and monitor the situation before thinking of returning to their various communities. (*Dr. Yunus, 54-*

*year-old Government Official, Ilorin).*

From the above narratives, the study showed that the flooding in Patigi Local Government Area has caused homelessness. Many of the residents of the affected communities are homeless and displaced. The level of destruction is enormously devastating as most of the households lost almost all their belongings and their homes were submerged. The analysis revealed that their coping strategy include living in camps under unsatisfying conditions and living on relief materials from government and relevant bodies. Most of the displaced people in camps complained that the houses where they are living in are sub-standard. They, therefore, seek assistance from the State Government to help them secure permanent settlements with low-cost houses, where they can decently call their homes. They complained that they do not have means to secure houses for themselves as all their means of livelihoods have been destroyed.

### **8.3. Flood Disaster Mitigation in Patigi Local Government towards Policy Formulation and Legal Framework (Objective 3)**

More than 90 percent of the experts suggested that there is the need for immediate commencement of the dredging of River Niger. One expert expressed that

Dredging of River Niger is necessary to prevent further destruction and loss in Patigi community... Also, the National Emergency Management Agency (NEMA) should intervene immediately. The agency needs to complement the actions of the Kwara State government to address the plights of the victims of the disaster. (*Dr. Orire, 61-year-old Expert, Ilorin*).

Another expert added that

The Federal Government should dredge River Niger through Lokoja, Barro and Jebba and beyond. This is vital in order to ensure that the water channel is deep enough so as to mitigate the level of flood in Patigi area. If this is done, the flood would have been subsided before reaching Patigi. (*Mr. Yusuf, 44-year-old Expert, Ilorin*).

Another participant expressed that

Government should take the issue of Hydro Power Area Development Commission (HYPADEC) serious. This project would assist in addressing the problem of flood in Patigi to a great extent. This is because HYPADEC would stimulate the dredging or construction of upland dam even if the Federal Government refuses. (*Mr. Oluayemi, 56-year-old Expert, Ilorin*).

A Professor of Geography and Environmental Studies noted that

Government has to relocate the affected people... they should be moved to upland... regulations should be followed and enforced by the government... there should be early warning in the discharge of water in the dam. (*Prof. Ifabiyi, 56-year-old Expert, University of Ilorin*).

When asked that what should be done to mitigate the impact of flooding on the well-being of the flood-induced persons, he stressed that

Insurance policy should be introduced to the victims by insuring their property and lives... They should also be compensated whenever they have problem. Also, they should be encouraged to join cooperative societies, particularly the farmers, so that they can assist themselves whenever they have crisis. (*Prof. Ifabiyi, 56-year-old Expert, University of Ilorin*).

Also, a community leader expressed that

NEMA should give early warning sign. The 48-hour flood alert given by NEMA in the last flood disaster was too short. This is a big community. How do you expect us to vacate our community within 48-hour? NEMA should develop a better means for sending warning signal perhaps a month or two before the incident... He also called the agency to work with the State Government to provide relief materials to the victims because the level of destruction was so devastating. (*Alhaji Ibrahim, 71-year-old Community Leader, Patigi*).

A youth leader from one of the affected communities expressed that

Government should provide alternative accommodation in the upland areas in order to prevent further destruction. (*Mr. Hassan, 34-year-old, Patigi*).

Over 90% of the victims complained that government has not been doing enough to address the challenges associated with the well-being of the victims of flooding in Patigi. They stressed that the relief materials are not adequate and not regular. The demand for compensation or soft loans for those people who lost their means of livelihoods has not been provided. The requests for the relocation of the people of the affected communities to upland areas with permanent settlements and low-cost houses have not yielded any results. From the results, government seems paying lip-service to the socio-economic conditions of the victims of floods in the affected communities.

## **9. Major Findings of the Study**

The study found that the risk of flooding on the well-being of flood-induced residents in Patigi Kwara State includes challenges of food security, indebtedness, increased poverty, death, ill-health, and low well-being of people and lack of access to quality education.

### **9.1. Risk on the Well-Being of Flood-Induced Displaced Residents in Patigi Kwara State, Nigeria (Objective 1)**

The analysis revealed that floods in Patigi community has caused significant loss of farmlands and destroyed many crops. Livestock farming and fishery were also disrupted, worsening the level of hunger and starvation especially on those who had been displaced. These had serious implications on achieving food security in

Patigi Local Government. For some of the farmers that obtained loan facility the washing away of their farmlands by flooding has put them in indebtedness as all hope to repay the loan after selling their harvests has been lost. The loss of livelihood of the farmers and fishermen worsened the level of poverty, since they live modestly before flooding and the effect of flooding has worsened their usual subsistence living.

Also, the flood caused death of some people and affected the health of some adversely, especially through water-borne diseases such as dysentery, cholera and typhoid. Malaria fever was predicted to be likely higher because floods breed mosquitoes and other parasites. Power infrastructure could also have been destroyed resulting to power outage, which could lead to damaging emission from the use of generators as alternative power supply, during floods and post-floods. It was also observed that the experience of flood disaster could trigger the episode of post-traumatic stress disorders, since a person who lost everything is likely to be depressed or even develop a suicidal thought. It was found that flood disaster affected access to education, as some schools were submerged, roads to some schools were flooded, some schools were used as displaced persons camps and parents and guardians became discouraged from sending their children/wards to schools for fear of possible flood disasters. All these affected access to quality education of pupils in Patigi community.

### **9.2. Coping Strategies of Flood-Induced Residents in Patigi Kwara State, Nigeria (Objective 2)**

The findings of the study revealed that the coping strategy of victims of flooding in Patigi communities include living in camps under unsatisfying conditions and sub-standard houses. They were living on relief materials from government and relevant agencies and NGOs, which supplied to victims in their respective camps/communities items like mattresses, clothes, food items, among others. They were hoping that State Government will help them secure permanent settlements with low-cost houses, where they can decently call their homes through their distress call to government, since they do not have means to secure houses for themselves as all their means of livelihoods have been destroyed.

### **9.3. Leadership Roles in Flood Disaster Mitigation in Patigi Local Government (Objective 3)**

The study found that good leadership performance can mitigate flood disaster.

In Patigi community of Kwara State, as more than 90 percent of the experts suggested that there is a need for immediate commencement of the dredging of River Niger by the federal government to prevent further destruction and loss in Patigi community. Dredging of River Niger could be through Lokoja, Barro, Jebba water tributaries and beyond. This will ensure that the water channel is deep enough so as to mitigate the level of flood in Patigi area, by doing this, the flood would have been subsided before reaching Patigi. Also, that National Emergency

Management Agency (NEMA) should intervene to complement the efforts of the Kwara State government to address the plights of the victims of flood disaster. Further, government should collaborate with Hydro Power Area Development Commission (HYPADEC) as HYPADEC can stimulate the dredging or construction of upland dam even where the federal government is unable.

It was also found that it was government leadership role to relocate the affected people to upland, issue regulations and enforce same. Not only that, government should issue timely early warning alerts in the discharge of water in the dam.

In addition, part of leadership role to mitigate the impact of flooding on the well-being of the flood-induced persons can take the form of government issuing insurance policies to cover lives and properties of flood victims, compensate flood victims and encourage them to join cooperative societies, particularly the farmers and fishermen whenever they have crisis.

#### **9.4. Discussion of Key Findings**

The aim of this study was to investigate the well-being of victims of flooding, their coping strategies and government leadership roles in mitigating the effect of flood-induced displacement in Patigi Local Government Area of Kwara State. The findings showed that loss of farmlands, destruction of many crops, livestock farming and fishery worsened hunger and starvation, especially on those who had been displaced, which had serious implications on achieving food security in Patigi Local Government, thereby aggravating their level of poverty. This finding is consistent with work of [Egbinola et al. \(2017\)](#), who argued that flooding is a critical factor of poverty; the existence of poverty is closely linked to the frequency of flooding, especially in the farming communities.

The study revealed that flooding in Patigi Local Government Area has denied many children access to quality education. Many children could no longer go to school because some schools in the affected communities have been submerged. In some schools, classes are filled up with floods and road leading to schools has been flooded to the extent that their parents/guardians are afraid of allowing their children to schools because they feel that it is dangerous and unsafe. This agrees with the study of [Mudavanhu \(2014\)](#) and [Echendu \(2022\)](#). According to these authors, flooding undermines the right of children to education. Children in areas where flooding is rampant are likely to be educationally disadvantaged as their classrooms may have been filled up with floods or roads to schools may have become flooded. Their lack of access to quality education due to persistent flooding at their crucial stages in life could affect them in the future.

Further, the study found that flooding has caused deaths of many people as well as outbreak of water-borne diseases such as cholera, dysentery among others. The analysis also showed that malaria is likely to be increased following flood disaster. This agrees with the study of [Olanrewaju et al. \(2019\)](#) that flooding has been found to impact health and well-being of people.

Moreover, this study has identified the critical needs of the federal and state

government with other relevant agencies to take the bull by the horn by playing significant leadership roles in dredging river Niger to mitigate flood disaster in Patigi. This is in line with Ogbonna, Okoro, & Osuagwu (2017) study, which recommended that dredging of Orashi River, South-East Nigeria should be carried out to eliminate the risk of flooding, to serve useful purposes in predicting flood events and design of flood control works in similar basins. Other leadership roles in mitigating effect of flooding include collaboration with HYPADDEC on energy, engage NEMA to increase humanitarian supplies to aid flood victims in Patigi communities, insure the lives and properties of Patigi residents against flooding and encourage them to participate in cooperative societies that can offer soft loans at very low interest during economic crisis.

## 10. Conclusion

Based on the findings, the study concludes that flooding in Patigi Local Government Area of Kwara State has affected the well-being of residents adversely, disrupted means of livelihoods of mostly farmers and fishermen and displaced several people. The coping strategy was living in tattered accommodation since they were rendered homeless by the flooding and they have to rely on the relief materials from Kwara State Government, the National Emergency Management Agency (NEMA), NGOs and other critical stakeholders to survive. Most of the victims complained that government has not been doing enough to address their well-being since the relief materials are not adequate and not regular. The demand for compensation or soft loans for those people who lost their means of livelihoods has not been provided. The requests for the relocation of the people of the affected communities to upland areas with permanent settlements and low-cost houses have not yielded any results. Government seems to be paying lip-service. Therefore, the leadership roles of government in mitigating the impact of flooding in Patigi communities was substandard and ineffective.

## 11. Recommendations

From the above findings, the study recommends that the National Emergency Management Agency (NEMA) should be more proactive in handling cases of flood disasters in the country. Relief materials should be adequately and regularly supplied to the affected households or individuals. The agency should work with the state government to improve the well-being of the poor households that are affected.

Residents in the flood-prone communities in Patigi should be relocated to upland areas. Government should evacuate people living in communities to new and safe settlements and provide low-cost houses for them. Also, government should provide soft loans and other means of financial assistance to those who lost their means of livelihoods to flood disasters; and should work with relevant agencies, Federal Government and Non-Governmental Organisations to achieve these in order to improve the coping strategies of the flood-induced displaced persons.

The study identified the importance of the leadership roles of the government in dredging the Patigi river tributaries, improve its early warning system, provide efficient spatial planning and sustainable drainage systems combined with ICT/technological tools.

Thus, it suggests a need for the dredging of River Niger, Lokoja, Barro and Jebba Dam being tributaries to the river in Patigi. This leadership role is fundamental to prevent overflow of the river causing flooding and destruction of property and loss of lives in the flood-prone communities in Patigi Local Government Area of the State.

Also, the government through the National Emergency Management Agency should improve on their early warning system by giving warning sign early enough in flashpoint areas. The 48-hour flood alert that the agency normally gives is too short for the flood-prone communities to prepare and evacuate. NEMA should develop a better means for sending warning signal perhaps a month or two before the incident.

Government should formulate and implement efficient spatial planning through sound coordination with relevant departments, agencies, planning experts and stakeholders. By this, the occurrences of flood and its associated risks are mitigated (Echendu, 2022). The efficiency of spatial planning lies in its capacity to manage flood risks and how type, location, function and design of development affect the occurrence of flood and its associated risks. To make spatial planning more effective, there is the need for collaborative and flexible initiatives which should take care of the public interests, urban growth and environmental issues.

The government should allocate substantial budget to prevent overflow and flooding of dams, rivers Niger, Benue and Kaduna in order to control flood-induced displacement rather than combating the challenges arising from post-flooding losses and damages.

In addition, the spatial planning incorporating sustainable drainage systems as a Flood Risk Management strategy could also be like applications that residents can use to communicate with the relevant authorities in the event of an emergency or blockage of drains and onset of flooding. Integrating spatial planning and FRM is key to controlling flooding and moving Nigeria a step closer to achieving the SDGs.

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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