e-Bangi Faculty of Social Sciences and Humanities Universiti Kebangsaan Malaysia
Journal of Social Sciences and Humanities

eISSN: 1823-884x

Volume 22, Issue 2, DOI: https://doi.org/10.17576/ebangi.2025.2202.53

Article

Contingency Planning and Flood Disaster Management in Nigeria: A Critical Study

Omowumi Boboye* & Nirmala Dorasamy

Department of Public Management and Economics, Faculty of Management Sciences,
Durban University of Technology, 4001 Durban, South Africa.

*Corresponding Author: boboye.wumi123@gmail.com; 22276892@dut.ac.za

Received: 01 January 2025
Accepted: 02 May 2025

Abstract: This paper examines the persistent challenge of floods in Nigeria despite established institutional frameworks for disaster management. As a result, millions of people are displaced each year. Based on this premise, this article investigates if there are contingency planning and measures to manage flood in Nigeria to curb disaster mismanagement towards ensuring sufficient food production, distribution and consumption in the country. This is done through the exploration of government policies on flood management particularly how best government prepare for flood pandemic. Theoretically, the article adopts the Emergency Management theory and contingency approach as the framework of analysis and relies heavily on secondary data which includes relevant contemporary books, peer-reviewed articles, newspaper reports on flood in Nigeria, images showing how flood ravaged some parts of Nigeria, and Government reports among others. The study dissects the experiences of flood disasters with occurrence of cases from a few Nigerian states; and a desk-top data analysis framework as its method of analysis. The study found out that insufficient funding, poor infrastructure, undue deforestation, environmental policy flip-flops, negligence of climate change records and lack of contingent response. Therefore, the study recommends afforestation, maintenance of dams, recovery commitment for the flood affected communities, appropriate responses to climate change records, environmental policy sustainability, a contingent model to flooding and effective application of emergency management principles.

Keywords: Flood; contingency planning; disaster risk management; emergency management; Nigeria

Introduction

In our changing world of today, we cannot only hope for the best to always come, there should be a level of preparedness for emergencies, disasters and hazard management. The development of cities and a change in climatic conditions stresses the need for adequate measures to facilitate urban development to be more sustainable and resilient. Climate change is a major problem globally (*Mavuso et al.* 2022) According to World Health Organization report on flood on the 16 September, 2024, 610,000 people have been impacted by flood across the Nigeria states, displacing over 225, 000 people, with a record of 201 deaths which covers 15 out of the 36 states and badly affected 115, 000 hectares of farmland, caused the destruction of vital infrastructures in the polity, facilitated an increase in the spread of infectious diseases and threatened food security (World Health Organization, 2024).

The issue of flooding is not alien to Nigeria as States has experienced diverse flooding incidents. For instance, Ibadan which is one of the cities mostly affected by flooding despite it is a non-coastal city area of Nigeria. Its first case of flood took place in 1933 with the houses at the bank of the river Cege getting

submerged in water (Agbonkhese *et al.* 2014). The major reasons attributable to flooding is due to the overflow of major rivers, disregarding meteorological early warning signs, changes in climatic conditions, excessive rainfall, dumping of waste materials, water release from manmade reservoirs and lack of maintenance of open drainages (Mfon *et al.* 2022). The primary cause of the recent disaster in Maiduguri was excessive rains that outweighed the Alau Dam, which had previously failed in 1994. The dam was intended to manage floodwaters from the Ngadda River, but it confirmed unable to sustain the current downpour (Ibrahim, Tumbe & Muhammad, 2024).

The experience in other African countries is relatively the same especially on the persistent occurrence of flood and the attendant implications. The peculiarity of flooding in other African countries apart from Nigeria was more prominent in 2020 in the heat of COVID-19 pandemic (Reed *et al.* 2022). For example, according to Ringo, Sabai and Mahenge (2024) in Uganda and Kenya, to ensure free flow of water, there have been more proactive measures in curbing flooding through local government involvement in cleaning existing drainage systems and construction of drainages where this is non-existent whenever imminent flooding is flagged. In Mozambique and South Africa, the utilization of mosques, public markets, schools, churches are being utilized to harbour flood victims. The construction of these shelters is strategically erected on high plains to avert flooding.

A total number of thirty out of thirty-six of Nigeria's states is badly affected by heavy downpour. Maiduguri, the capital of Borno State in north-eastern Nigeria, has been badly damaged by water since the collapse of the Alau Dam which has displaced well over 640, 000, and has affected over 1million people as well and led to the death of 269 lives (UNHCR, 2024). A pictorial representation is captured in figure 1. This catastrophe is considered one of the most severe natural disasters in the region in recent years. This occurrence caused substantial damage to infrastructure and housing, resulting in widespread displacement and humanitarian needs. Before the September 2024 flooding, the most disastrous incidence of flooding was recorded in 2012, which impacted 16million Nigerians, resulted in 363 mortality and displacement of over 2.3million people (Echendu, 2022). Nevertheless, flooding and food insecurity is becoming alarming due to the government not finding a lasting solution to this problem. Some studies have attributed the problem of food insecurity to the ongoing conflicts that persist between farmers and Fulani herdsmen which has drastically caused a reduction in the agricultural activities, in the same vein food production has been affected leading to food insecurity (Okwulu *et al.* 2024; Ani, Anyika & Muutambara, 2021).

Figure 1. Images of 2024 flooding in Maiduguri and Ondo State, Nigeria
Source: Google images of Nigeria's Borno and Ondo State 2024 flooding (2024)

The need for adequate government intervention concerning the aftermath effects of flooding on the populace in Nigeria is of utmost importance as the country is particularly experiencing economic crisis, depreciation of the naira, hike in fuel price, inflation of food commodities, disregard for the country's rule of law, scarcity of vital items, and rise in criminal activities (Suleiman, Daura & Liberty, 2023 ; Daniel *et al.* 2023). Climate change also impacts food security, nutrition and health, especially in low-and-middle income countries (Agistoni, *et al* 2023).

The menace of flooding in Nigeria has been a long-standing occurrence which predates back to early 1950s with two basic flood issues which are fluvial and coastal floods. Fluvial flood is the major cause of floods that occurs around plains that connects to main rivers which are the river Hadeja, Benue and Niger rivers. Whereas coastal floods often affect the southern part of the country with 'low-lying geographical terrains due to periodical disruption of major water and rivers overwhelming their artificial and natural barricades (Odiana, Mbee & Akpoghomeh, 2022). Despite the existence of early warning systems and prediction data, Nigeria has endured devastating flooding on a consistent basis (Odufuwa, Adedeji & Oladesu, 2012; Louw *et al.* 2019; Danhassan *et al.* 2023). Despite meteorological authorities' (For instance, Nigeria Hydrological Services Agency) warnings of impending flooding, Nigeria continues to incur substantial personal, economic, and infrastructure losses due to poor preparedness and response procedures.

Recently, the Nigerian Hydrological Services Agency earmarked that 148 local government areas across 31 states was named as high flood risk areas, this includes Yobe, Taraba, Sokoto, Rivers, Oyo, Osun, Ondo, Ogun, Niger, Nasarawa, Lagos, Kwara, Kogi, Kebbi, Katsina, Kano, Kaduna, Jigawa, Imo, Edo, Ebonyi, delta, Cross River, Borno, Benue, Bayelsa, Bauchi, Anambra, Akwa-Ibom and Adamawa states. In the same vein, 249 Local Government Areas (LGAs) out of the 668 (LGAs) in the 36 states of the federation and six Local Council Development Areas (LCDAs) in the Federal Capital Territory (FCT) were categorized as moderate flood risk areas. The Federal Government of Nigeria wrote to 31 State Governors informing them of the upcoming floods (Punch Newspaper, 2024). The eventual occurrence of the flood on the 9 of September 2024, which caused the destruction of shelters, crops, infrastructures, businesses, and government facilities were affected which increased the number of displaced people in the country (Adimula and Abdusalam, 2024).

In spite of the above governmental efforts, this study tends to fill the gap establishing the nexus between flood early warning information and the implementation of adequate contingency plans. Hence, the gap raises serious concerns about the shortcomings in turning early warning knowledge into meaningful contingency preparations and positive outcomes. The study would explore institutional, resources allocation, coordination, and implementation hurdles that limit prompt and effective responses to flood warnings. Understanding this issue is critical as climate change intensifies rainfall patterns and increases flooding frequency in Nigeria's susceptible regions, making effective contingency plans increasingly necessary.

Literature Review

1. Flood

Various scholars and writers have offered perspectives as to the meaning and contextual understanding of the concept "flood". Of course, flooding is a universal hazard capable of negatively impinging on the lives and properties of the entire human race. Flood is an overflowing or eruption of a great body of water over land not usually submerged. It is a volcanic eruption submerging the earth and obstructing the free flow of people, killing people, carting away of houses, farmlands and properties (Nkiruka, Chinedu & Smart, 2023; Katyal & Petrisor, 2023). Simply, flood is an overflow of water onto the land previously uncovered by water. It is the prevalence of water that is not wanted.

2. Contingency Planning

Contingency planning can be defined as the process of preparing beforehand to tackle an unforeseen event in a comprehensive manner. It is also referred to as the "Plan B" in the advent of a failure of a pre-planned form of action (Atiku, 2021). The concept stresses the need for the development of proactive efforts that foreshadow potential risks and earmark procedural ways to mitigate their impacts.

3. Disaster Risk Management

Disaster management is the coordination and putting to good use resources accruable for containing humanitarian and natural facets of emergencies, in accordance with preparedness, response and recovery to mitigate disasters (Das, 2023). Disasters can be reduced through an all-encompassing, multi-dimensional, multi-sectorial, all-hazard and community-centred approach (Shakeri, Vizvari & Nazerian, 2021). There are diverse studies covering disaster management either natural or man-made (Shakeri, Vizvari & Nazerian 2021; Ajake *et al.* 2022) in the Nigeria polity. These studies detailed various dimensions of flooding as a serious environmental hazard in the country causing untoward effects on the overall growth and development of Nigeria. Odunsi *et al.* (2023) investigates household resilience to flooding in Lagos State, Nigeria, focusing on absorptive, adaptive, and transformative capacities across different flood zones (pluvial, fluvial, and coastal). It employs a framework based on General Systems Theory and Resilience Capacity Theory, highlighting the significance of various capitals, natural, physical, social, economic, and institutional, in enhancing resilience. Findings reveal that while natural and social capitals show stronger capacities, economic and institutional aspects are notably weaker, indicating a need for improved infrastructure and disaster management policies to bolster resilience against flooding.

In another study, Obi *et al.* (2021) examines indigenous flood control and management knowledge in coastal communities of Delta State, Nigeria, employing a mixed-method approach that includes focus group discussions and questionnaires. It identifies 36 indigenous practices for flood risk reduction, with eight categories of practices found to be 61.2% effective in mitigating flood risks. The research emphasizes the importance of integrating indigenous knowledge with modern flood management strategies to enhance community resilience against flooding, highlighting both structural and non-structural measures utilized by these communities.

The socio-economic impact of flooding was examined by Gbadamosi *et al.* (2024) on the Dagiri community in Gwagwalada, Abuja, revealed that a significant portion of the population is vulnerable to flooding due to inadequate coping strategies, with 40% of residents lacking any response. The study highlights the effects of flooding on livelihoods, property, and education, emphasizing the need for improved drainage systems, government action against illegal sand mining, and enhanced disaster management funding. It calls for integrated flood management policies and community-level mitigation measures to address the growing frequency of flooding exacerbated by urbanization and climate change.

Oyeaka *et al.* (2024) highlights the impact of climate change on food security and agriculture in Africa, emphasizing the interconnectedness of climate variability, socio-economic challenges, and the need for adaptive strategies. It highlights the adverse effects of changing weather patterns on agricultural productivity, food prices, and vulnerable populations, particularly women and low-income individuals. The review calls for coordinated efforts, innovative agricultural practices, and investment in resilience-building measures to address the urgent challenges posed by climate change, while also recognizing the role of international organizations in supporting these initiatives.

Otekunrin (2024) earmarks the effects of food insecurity in Sub-Saharan Africa by highlighting alarming rates of child malnutrition and food insecurity. It presents data from the Global Hunger Index (GHI) and Global Food Security Index (GFSI), revealing that while developed countries have made some progress, many regions, especially in Africa, are experiencing worsening conditions due to factors such as the COVID-19 pandemic, conflicts, and rising food prices. The document emphasizes the urgent need for collaborative efforts and policy recommendations to combat hunger and improve food security, particularly in vulnerable regions. Week and Wizor (2020) study also affirm the impact which flooding has on food security and livelihoods in his study in the Niger Delta region, revealing significant negative effects on traditional occupations, food availability, and health. It highlights that flooding leads to chronic food insecurity, reduced agricultural productivity, and economic hardships, with many residents struggling to access enough food post-flood. The findings emphasize the urgent need for improved flood management strategies, community advocacy for holistic development, and government infrastructure improvements to enhance resilience against flooding in vulnerable communities.

4. Theoretical Framework

This study adopts contingency and emergency management theory as its framework. Contingency/situational approach suggests that there is no one best way of solving problems but dependent on the present situation of things. In flood management solutions is tantamount to the level of preparedness in accordance with different scenarios. Flood management preparation should be an all-encompassing adventure across the federal, state and local government communities. Different institutions of government should be able to analytically rationalize appropriate measures that can scale up the management of an eventual flood disaster in their respective domains. The scope of emergency management theory covers how to mitigate, prepare, respond and recover when disasters such as floods occur. The theory was postulated by McEntire in the year 2004. The onus of the theory is to give room for an all-encompassing approach to the management of disaster by incorporating mitigation, preparedness, disaster response, and recovery stages. Emergency management theory is of the view that, for a management strategy to work there is a need for a holistic arrangement for diverse hazards (McEntire 2004 cited in Ughulu and Igabor, 2021).

Methodology

The study used qualitative content approach, with a focus on Borno, Kogi, Jigawa and Ondo states, the research employs multi-case and comparative study by paying close attention to the available data on flood management across few selected states in Nigeria. A comprehensive empirical literature review was undertaken using Google Scholar and related search engines such Scopus, Web of Science, Elsevier and so on, that documented recent flood disasters, government responses, and community impacts was gathered from peer-reviewed journal publications, media archives, newspapers, and the intuitive reports of governmental and non-governmental organizations. The recent reputable scholars were cited in the literature reviewed which have the greatest relevance to Nigeria was researched for this study which the emergency management framework and contingency planning served as a guide for the empirical studies of the literature.

The Findings

1. Principles of Emergency Management in the context of Flood Administration in Nigeria

The principles of emergency management are divided into four. These are disaster preparedness, mitigation, response and recovery.

Disaster Preparedness

The level of a country's preparedness goes a long way in the protection of the lives and properties of its citizenry as well as facilitate proactive recovery when disaster eventually ensues. Preparation encapsulates planning, earmarked procedural ways to mitigate disasters, and the resources available at their disposal. These are mapped out not only to cover for a timeous disaster response alone but also to adequately facilitate a smooth recovery process. Flooding activities usually affect food security, contingency measures need to be put in place to address immediate and long-term food security schemes. The issue of flooding is a threat to the environment and sustainable development of Nigeria.

The government operates through the National Emergency Management Agency (NEMA), which sends early warning signals to communities on imminent floods. Early warning signs are important to reduce the impact of disasters. The communities also play vital roles in the preparatory stage through information dissemination to residents. The establishment of Flood Early Warning Systems (FEWS) in Nigeria is a priority for the government worldwide in both developing and developed countries, as outlined in various reports and studies. These systems are designed to integrate technical monitoring, risk knowledge, and effective communication to ensure that communities receive timely warnings about impending floods (Ibeabuchi, 2022; Perera *et al.* 2020; Byaruhanga *et al*. 2024). The Nigerian FEWS utilizes advanced technology, including remote sensing and data acquisition devices, to monitor water levels and disseminate alerts via mobile communication channels, radio adverts, flood sirens (Ringo *et al.* 2023). FEWS have been of utmost importance in the following areas:

i. Timeliness and Accuracy of Alerts: One of the primary objectives of EWS is to provide timely and accurate information about potential flooding events. The integration of hydrological and meteorological data allows for improved forecasting capabilities. For instance, the Nigerian Meteorological Agency (NiMET) which became operative in 2003 backed up legally under the Nimet Establishment Act No.23 of 2003. The agency is saddled with serving as a watch dog of weather conditions in Nigeria, also, it collects data, process and forward all meteorological reports in Nigeria and outside the country. It is imperative for the agency to set adequate standards that do not deviate from meteorological quality, which is also at par with the international benchmark of meteorological activities. Meteorological activities have been effective in areas such as forestry, agriculture, land transport, aviation industry, fishery, construction, marine rigs, and utilities and energy production (Hussaini and Matazu, 2023). The Nigerian Hydrological Service Agency (NIHSA) also have established networks that facilitate data collection and analysis, which are crucial for issuing early warnings. Both NEMA and NISHA work in cohort to predict and state imminent flooding activities (Danhassan *et al.* 2023).

ii. Community Preparedness and Response: Effective EWS not only focuses on alert dissemination but also on enhancing community preparedness. Public awareness campaigns are essential in educating communities about flood risks and appropriate responses, to adequately cut down the aftermath of floods (Olaniyan, 2024). FEWS emphasizes a people-centered approach, aiming to empower local populations with knowledge about risks and response strategies (Perera *et al.* 2020). Studies indicate that when communities are well-informed and prepared, the potential for loss of life and property decreases significantly (Sigh, Tabe and Martin; Perera *et al.* 2020). The communities' areas of strengths and weaknesses should be known accordingly before the commencement of assessment (Dukiya & Benjamine, 2021).

iii. Institutional Coordination: The success of EWS relies heavily on the coordination among various governmental and non-governmental organizations involved in disaster management. The disconnect between institutions maligns disaster management. The 2012 flooding although was forecasted earlier by NIMET before it occurred and NEMA was involved in the broadcasting through mass media outlets, the message did not reach the targeted audience because of non-use of indigenous channels to communicate to the farmers in Delta state Nigeria (Ebhuoma & Leonard, 2021).

Hazard mitigation

Hazard mitigation's main agenda is to stop disasters before their occurrence. This is facilitated through making human behavioural changes that reduce the impact of floods. The change infused through natural water containment such as dams that are properly managed and prevented from siltation, that is avoid sediments in dams which can reduce its water retention and avoidance of construction on floodplain helps in the reduction of loss of properties and lives during flooding activities (Ezugwu *et al*. 2022; Siders *et al.* 2024). This points to the importance in infrastructural development that is well constructed to withstand heavy rainfall (Ojo & Emmanuel, 2024).

Emergency Response

Emergency response starts once a disaster occurs. In some instances, hazard monitoring systems send warnings to authorities of a disaster that is imminent. When an assessment of the impact of the disaster is known, resources can be channelled to the most impacted areas. The goal of emergency response is to protect the population. The Nigerian government plays a pivotal role in coordinating disaster response efforts through shared responsibility within the ambit of the federal, state and local government (Sriram, Dorasamy & Vipul, 2022). Thus, various agencies collaborate to assess the urgent needs and distribute relief materials such as the

civil societies and organized private sector. The National Emergency Management Agency (NEMA) is primarily responsible for coordinating disaster management activities, including flood responses which is responsible to the federal government. NEMA works alongside local and state governments to ensure that affected communities receive timely assistance. NEMA calls upon the federal government when the disaster is more overwhelming than it can handle (Danhassan *et al.* 2023). Under the auspices of state and local government, the coordination of disaster management is simultaneously referred to as State Emergency Management Authority (SEMA) and Local Governments Management Authority (LEMA). To mitigate disaster and to give room for early response, the government ensured the opening of NEMA offices across the 36 states of the country and Abuja who reports to the headquarters. There are also regional storehouses for emergency response in all her geopolitical areas (Dukiya and Benjamine, 2021).

There are likewise agencies that manages emergency response such as the Federal Road Safety Corps (FRSC), Nigeria Police (NPF), Nigeria Security and Civil Defence Corps (NSCDC), Nigeria Immigration service (NIS), Nigerian Prison Service (NPS), Federal Airport Authority (FAAN), Federal Roads Maintenance Agency (FERMA), Directorate of Road Transport Services (DRTS/VIOs), Nigerian Airspace Management Agency (NAMA), Private Construction Companies, Federal/State Ministry of Health (FMOH), Federal/State Ministry of Works (F/SMOW), Federal/State Ministry of Environment (F/SMEnv), Federal Ministry of Transport (FMOT),Federal Ministry of Aviation (FMOAvi), Nigerian Customs Service(NCS), Federal Fire Service (FFS), Nigeria Red Cross Society (NRSC), Nigerian Maritime and safety administration (NIMASA), Accident Investigation Bureau (AIB) and the Military (Army, Navy, Air Force)-Disaster Response Units (DRUs) (Gambo 2006 cited in Anthony, Agetue and Obuseh, 2019).

Non-governmental organizations (NGOs) such as Doctors Without Borders are actively offering impacted people medical assistance to affected communities. For instance, World Health Organization dispatched mobile health teams which is made up of 20medical doctors, and medical supplies such as essential drugs to areas impacted in Maiduguri (WHO, 2024). The International Organization for Migration (IOM) and the World Food Programme (WFP) have been instrumental in delivering aid. In Nigeria IOM allocated the sum of $ 2.4million in 2024 through its Rapid Response Fund to provide critical relief supplies, including temporary shelters, sanitation facilities, clean water, sanitation services, protection and monetary assistance for over 228,777 who were affected by the flood (Adejoro, 2024) (Punch Newspaper). WFP's Initiatives set up food kitchens in flood-affected areas, providing nutritious meals for families who have lost their homes. For instance, in Maiduguri, WFP mounted food kitchens in Yerwa, Teachers' village and Asheikh to cushion the effects of flood on affected victims in collaboration with the state government in Borno (WFP, 2024).

Disaster Recovery

Recovery kicks off once flooding ends, communities try to pick up their lives together until they are fully back to normalcy in their respective communities as the road to recovery is an evolving one (Okunola & Werners, 2024). Recovery levels of different communities will be based on their resilience which can be attributed to their social structure and resources accruable to these communities. Those with strong resource base find it easy to recover from flooding in comparison with the weaker ones, that is urban areas often recover faster than rural areas. High-income neighborhoods cope well and experience quick recovery when faced with flood disasters in comparison with those from middle-income neighborhoods (Ajibade, McBean & Bezner-Kerr, 2013; Ogunleye, Arohunsoro & Ibitoye, 2023).

There are some communities which wholly rely on agricultural produce for their sustenance, this exposes them to be more at the receiving end of the aftermath of disasters (Hallegatte *et al.* 2020). Flood does not only destroy crops plantation but also has a ripple effect on local economies, which often leads to an increase in poverty level (Lawanson, Proverbs & Ibrahim, 2022). This is caused by short supply of food items because of crop yield loss, thereby making it extremely more difficult for those living below poverty level to eat good foods that nourishes the body leading to malnutrition (Hallegatte *et al.* 2020).

2. Early Warning Systems and Its Challenges in Nigeria

Problems still exist despite continuous efforts by NGOs and government organizations. The following issues still serve as a clog in the wheel of progress of flood and food insecurity management in Nigeria;

Data Gaps: Limited access to reliable hydrological and meteorological data can impede accurate forecasting (Dinku, 2019). Lack of data is one of the problems of Sub-Saharan African cities due to its effects on lack of systematic and comprehensive records, government struggle to fully grasp the range of risks which their populations face which limits the ability to effectively and efficiently see to adequate interventions and leads to increase of vulnerability of marginalized populations (Adelegan, 2020; Lamptey et al. 2024).

Institutional Fragmentation: A lack of coordination among different agencies responsible for disaster management can lead to inefficiencies. State governments are often laid-back concerning disaster management and preparations in Nigeria. The 2022 floods which ought to serve as an eye opener for all states to adequately swing into preparing for future occurrence of floods were not prepared, some states did not earmark budgetary allocations to cater for flooding activities those that had budgetary plans failed to implement mitigative measures of flooding with the budgeted funds (Daniel *et al.* 2023).

Community Engagement: Ensuring that communities understand how to respond to warnings is crucial, however, gaps in public education persist as communities still lack the wherewithal to overcome flooding issues. The Sendai initiative was to oversee the resilience of communities which was adopted as a replacement of the Hyogo framework has failed earnestly to curb flooding challenges in communities as the problem persists after 4years of its inception (Nkwunonwo, 2020). The lack of full community participation is detrimental to any society as mitigation is captured to be local. In the management of disasters top-down approaches when used alone do not work well, most especially in countries where community emergency management is not adequately mapped out and when this is implemented, preventive and mitigative measures ultimately discard capabilities at the local level as well as their experience. The COVID-19 outbreak of 2020 has further justified the crucial role in which community engagement plays in assuaging the widespread of diseases as well as mitigating industrial and natural disasters (Corbin *et al.* 2021).

Resource Gaps: There is often a significant gap between the needs of affected populations and the resources available for response efforts. NEMA is faced with diverse challenges with funding been a major problem, inadequate facilities, political factors, lack of awareness and advocacy, weak policy initiatives (Ude, Walter & Eneh, 2024).

Access Issues: Floods can hinder access or limit access into affected areas due to damage of infrastructure like roads can make it difficult for aids to reach remote or severely affected areas thereby hindering the process of evacuation of flood victims (Adelekan, 2020). Furthermore, food assistance is desperately needed if markets are disrupted due to flooding activities as pastoral and agricultural producers are blocked out from selling their produce and intending buyers from getting food commodities (Reed *et al.* 2022).

3. Impacts of flood in Nigeria

Displacement and casualties: The data on the impact of flood in Nigeria are often insufficient to capture the accurate impacts in diverse locations (Umar & Gray, 2023). Flood displaces people from their homes. The 2012 flooding was accounted to have displaced 3, 871, 53 (FGN, 2013). The flood in Maiduguri has accounted to have displaced over 640, 000 (UNHCR, 2024).

Infrastructure damage: Flooding causes detrimental damage to important facilities. Bridges have partially fallen, limiting access to critical services including healthcare and markets. Flooding has profound socio-economic consequences. It disrupts livelihoods by damaging homes, agricultural land, and local businesses. For instance, a study in Zambia indicated that floods severely impacted agriculture, housing, and access to essential services like education and healthcare (Rawlins & kalaba, 2020). Essential services such as school facilities may be rendered inoperable, leading to significant educational disruptions due to flooding activities. Floods have facilitated the closure of diverse schools (Hussain *et al.* 2024). Developing nations suffer more than the developed ones, vulnerable groups also are not left out of the quagmire, such as the

elderly or those with disabilities often struggle more than others to recover due to limited resources and support systems (Ogunleye & Ibitoye, 2023).

Economic impact: The economic costs associated with flooding can be shocking which has negative effects on the sustainable development of countries affected by it. In Nigeria flood disaster costed 1 trillion naira (around $6.4 billion USD) spanning the year 1965-2012, in the same vein the country incurred economic loss ranged between $3.79billion -$9.12 billion as calculated around 25 November 2022, which falls within a median amount of $6.68 billion (Ikiriko & Gbarabe, 2024). Also, in Australia the average annual cost from floods was estimated at $377 million between 1967 and 2005 (Hou et al. 2023). In Maiduguri State between the year 2018-2022 World Bank stated the economic impact of the disaster was evaluated to be $ 50million (Uba, 2024). Communities often face prolonged recovery periods due to the destruction of infrastructure and slow process of building up affected areas (Dyke, Mathew, & Agnes, 2020; Birkmaann *et al*. 2023).

Health Risks: Floods pose immediate and long-term health risks. Areas that experience flooding disasters tend to be plagued with populations that are nutritionally deficient due to the short falls in the supply of important amenities and food items (Godwin *et al.* 2024). Nigeria which is battling with existing food insecurity due to climate change that is varied across her regions. The coaster states of Ondo, Bayelsa, Cross-Rivers, Delta, Edo, Lagos, Akwa-Ibom and Ogun are plagued with constant flooding because of rising ocean levels. The northern region is not left out as Gombe, Borno, Zamfara, Sokoto, Kano, Katsina, Kebbi, Jigawa and Yobe are faced with extreme drought (Olunusi, 2024). Flooding has exacerbated pre-existing malnutrition among people caused by armed banditry, herdsmen issues, insecurity, kidnapping, armed robbery and ethnic militia which has enormously affected economic as well as production activities in the country (Adeyeye *et al.* 2023). The aftermath of the flooding poses serious health hazards as waterborne infections like cholera and malaria are a growing concern in displacement camps due to contaminated water supplies and inadequate sanitation (MSF, 2024). The most common causes of mortality during flooding are drowning and injuries from swift currents or debris. Drowning accounts for approximately 91% of flood-related deaths, particularly affecting vulnerable populations in low- and middle-income countries (LMICs) where evacuation systems may be inadequate (Le De, 2024).

Environmental damage: Environmental damage due to flooding activities in Nigeria, has further compounded the actualization of the postulated achievement of sustainable development goals by the year 2030, as it impedes SDGs 2,6, 14 and 15. This is not a good indicator as the country is already ranked 160 out of 166 on the global scale, with a sub-regional position of 13th in West Africa (Ogbodo *et al.* 2021). Flooding has been attributable to cause detrimental effects on human environments due to hazardous soil pollutants such as polycyclic aromatic hydrocarbons (PAHs), cyanide, ammonium, hydrocarbons, heavy metal (loids), Dioxins, hydrophobic organics are transported from contaminated areas to un-contaminated soil and water (Okoye et al. 2023; Biswas *et al*. 2018). The recent Maiduguri flooding affected 111, 154 hectares of land utilized for farming which caused the loss of about 166, 731 metric tons of food, leading to food insecurity (Brosnana, 2024).

Discussion

1. Failures of contingency and emergency management in Nigeria

Notwithstanding, Nigerian Meteorological Agency (NiMET) and Nigerian Hydrological Service Agency (NIHSA) periodic environmental warning signs, these has not translated into robust contingency measures. Flood prone areas are named without adequate mitigative plans. Contingency plans are built on clearcut triggers and actionable plans with regards to devising in advance alternative courses of actions to take in severe circumstances for effective and efficient flood management. Allocation of resources to manage probable impact and anticipated frameworks for future occurrence is important for the management of floods. For instance, Kogi state has experienced recurring flooding events (Nche, 2024). This serves as a pointer to the reason for the recurrence of floods despite early warning signals. Based on the weak links between the provided early warning indications and response systems.

The core principle of emergency management is an all-encompassing one due to its interconnectedness. Nigeria is deficient in the adequate maintenance of levees, dams and drainage systems which are ways of mitigating impending flood. The Borno State flooding was due to the collapse of Alau Dam that led to the loss of lives and properties in the State due to heavy downpour that has outdated current infrastructures in the State. Sustainable land use in flood prone areas is drummed to manage runoff and allow water retention. Reforestation and wetland restoration efforts are some of the long-term strategies in flood mitigation in Nigeria (Uba, 2024). The disconnect between federal, state and local governments and inadequate resource allocation and lack of community engagement stifles preparedness for imminent floods. In a study of the recovery process undertaken after the Jibia flood in katsina state. It took the state and federal government a long time to take appropriate measures to ensure recovery. This undue negligence brought about a re-occurrence of flooding in the area (IgudaLadan & Saulawa, 2021). The disconnect between governmental and non-governmental organizations oftentimes causes a delay in disaster response in the advent of floods which in turn aggravates the impacts of disasters (Ogunkoya, 2022).

Conclusion

The humanitarian response to flooding in Nigeria requires intricate coordination between government programs and non-governmental organizations (NGOs), with recent floods in Maiduguri showing the country's exacerbated issues. Despite years of disaster management systems in Nigeria, institutional frameworks continue to fall short of meeting sustainable development objectives. Immediate humanitarian aid remains critical for meeting basic requirements such as food security, healthcare access, and sanitation, while long-term planning must focus on strengthening resilience to future floods. The study emphasizes the value of indigenous communication channels, community-based policies, and social components of disaster management in developing more resilient communities.

Based on an examination of contingency and emergency management frameworks, specific recommendations include prioritizing afforestation to rehabilitate flood-prone areas and enhancing dam maintenance protocols to maintain optimal operation during heavy rainfall. Given the unpredictable nature of climate, greater water management infrastructure is required, while Nigeria's position as Africa's largest economy demands solid contingency planning frameworks supported by substantial financial resources proportionate to its population size. The Borno tragedy exemplifies how better infrastructure assessment and reinforcement efforts could have avoided devastating consequences. The study also advises thorough rehabilitation actions to rehabilitate damaged areas and avert future disasters. Practical disaster simulation exercises should be used to improve community engagement, with individuals in flood-prone areas getting education on procedural responses tailored to their specific local circumstances. These community-oriented measures should be supplemented by mitigation strategies such as land-use planning rules to reduce flood risks and agricultural practice initiatives to reduce impacts on food supply chains. Clear communication lines that are free of ambiguity are critical for coordinating emergency groups, humanitarian agencies, and agricultural services to respond and recover effectively.

Acknowledgement: The authors appreciate the Durban University of Technology's support for this study.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflict of interest.

References

Adejoro, L. (2024, December 1). IOM releases $668, 000 for flood relief in Nigeria. *Punch.* Retrieved from https://punchng.com/iom-releases-668000-for-flood-relief-in-nigeria/

Adelekan, I.O. (2020). Urban dynamics, everyday hazards and disaster risks in Ibadan, Nigeria. *Environment and Urbanization*, *32*(1), 213-232. https://doi.org/10.1177/0956247819844738.

Adeyeye, S.A.O., Ashaolu, T.J., Bolaji, O.T., Abegunde, T.A. & Omoyajowo, A.O. (2023). Africa and the nexus of poverty, malnutrition and diseases. *Critical Reviews in Food Science and Nutrition*, *63*(5), 641-656. https://doi.org/10.1080/10408398.2021.1952160.

Adimula, R. A., & Abdusalam, O. A. (2024). Leadership roles in mitigating flood-induced displacement in Patigi, Kwara state Nigeria. *Open Journal of Leadership*, *13*(4), 464-487. https://doi.org/10.4236/ojl.2024.134025.

Agbonkhese, O., Agbonkhese, E.G., Aka, E.O., Joe-Abaya, J., Ocholi, M. & Adekunle, A. (2014). Flood Menace in Nigeria. Impacts, Remedial and Management Strategies, *6*(4), 31-40. https://www.iiste.org/Journals/index.php/CER/article/view/12140/12492

Agostoni, C., Baglioni, M., La Vecchia, A., Molari, G. & Berti, C. (2023). Interlinkages between climate change and food systems: the impact on child malnutrition narrative review. *Nutrients*, *15*(2), 1-15. https://doi.org/10.3390/nu15020416.

Ajake, A.O., Eneyo, V., Akpan, N., Obi, F., Eja, E., Kharbish, S. & Eldosouky, A.M. (2022). Analysis of participatory dimensions of landslide disaster and risk management in some rural communities of southeastern, Nigeria. *Carpathian Journal of Earth and Environmental Sciences*, *17*(2), 323-338. https://doi.org/10.26471/cjees/2022/017/225.

Ajibade, I., McBean, G. & Bezner-Kerr, R. (2013). Urban flooding in Lagos, Nigeria: Patterns of vulnerability and resilience among women. *Global Environmental Change*, *23*(6), 1714-1725. https://doi.org/10.1016/j.gloenvcha.2013.08.009

Ani, K. J., Anyika, V. O., & Mutambara, E. (2021). The impact of climate change on food and human security in Nigeria. *International Journal of Climate Change Strategies and Management*, *14*(2), 148-167. https://doi.org/10.1108/IJCCSM-11-2020-0119.

Anthony, N.E., Agetue, F.N. & Obuseh, R. (2019). An overview of emergency preparedness, response and disaster management in Nigeria: A study of NEMA. In *World Educators Forum: An International Journal, 11*(1), 285-306.

Asiedu, L. A., Andoh-Kumi, F. & Koomson, S. (2022). Leadership styles adopted in selected non-bank financial institutions in the Cape Coast metropolis, Ghana. *Journal of Psychological Perspective*, *4*(1), 1-8. https://doi.org/10.47679/jopp.411862022.

Atiku, M., Abdullahi Garba, A., & Musa Bade, A. (2021). A brief analysis on the existing disaster recovery phases and activities plans. *International Journal of Software & Hardware Research in Engineering (IJSHRE), 9*(2), 55-64.

Badamosi, A.P., Olutumise, A.I., Olukoya, O.P., Adegoroye, A. & Aturamu, O.A. (2024). Socioeconomic impacts of flooding and its coping strategies in Nigeria: Evidence from Dagiri community, Gwagwalada area council of Abuja. *Natural Hazards Research*, *4*(3), 374-386. https://doi.org/10.1016/j.nhres.2023.09.010.

Birkmann, J., Schüttrumpf, H., Handmer, J., Thieken, A., Kuhlicke, C., Truedinger, A., Sauter, H., Klopries, E.M., Greiving, S., Jamshed, A. & Merz, B. (2023). Strengthening resilience in reconstruction after extreme events–Insights from flood affected communities in Germany. *International Journal of Disaster Risk Reduction*, *96*, 1-18. https://doi.org/10.1016/j.ijdrr.2023.103965.

Biswas, B., Qi, F., Biswas, J.K., Wijayawardena, A., Khan, M.A.I. & Naidu, R. (2018). The fate of chemical pollutants with soil properties and processes in the climate change paradigm—A review. *Soil Systems*, *2*(3), 1-20. https://doi.org/10.3390/soilsystems2030051.

Brosnan, U. (2024, November 13). *Extreme floods test survival and reilience in conflict-ridden part of Nigeria*. Retrieved from https://www.unocha.org/news/extreme-floods-test-survival-and-resilience-conflict-ridden-part-nigeria.

Byaruhanga, N., Kibirige, D., Gokool, S. and Mkhonta, G. (2024). Evolution of Flood Prediction and Forecasting Models for Flood Early Warning Systems: A Scoping Review. *Water*, *16*(13), 1-29. https://doi.org/10.3390/w16131763.

Corbin, J.H., Oyene, U.E., Manoncourt, E., Onya, H., Kwamboka, M., Amuyunzu-Nyamongo, M., Sørensen, K., Mweemba, O., Barry, M.M., Munodawafa, D. & Bayugo, Y.V. (2021). A health promotion

approach to emergency management: effective community engagement strategies from five cases. *Health promotion international*, *36*(1), i24-i38. https://doi.org/10.1093/heapro/daab152.

Danhassan, S.S., Abubakar, A., Zangina, A.S., Ahmad, M.H., Hazaea, S.A., Ishak, M.Y. & Zhang, J. (2023). Flood policy and governance: A pathway for policy coherence in Nigeria. *Sustainability*, *15*(3), 1-24. https://doi.org/10.3390/su15032392.

Daniel, F.M., Gbuchie, M.A., Emeruwa, V.E., Ike, W.I., Udam, N.G. & Torubiri, A.O. (2023). Nigeria's Flood Disaster Unpreparedness: Impacts on Health and the Society. *Cross River Journal of Medicine*, *2*(2), 12-20. http://dx.doi.org/10.5455/CRJMED.162000.

Daniel, E. E. and Udo, R. (2019). "Human-environment interactions". In Ibok, E., Daniel, E., & Atakpa, O. (eds). *The Politics of Global Environmental Policies*. Calabar: University of Calabar Press.

Dukiya, J.J. & Benjamine, O. (2021). Building resilience through local and international partnerships, Nigeria experiences. *International Journal of Disaster Risk Management*, *3*(2), 11-24. https://doi.org/10.18485/ijdrm.2021.3.2.2

Dyke, T., Mathew, T. H., & Agnes, R. S. (2020). Rural community perceptions on the impact of climate change on subsistence farming: Mutoko community in Zimbabwe. *E-Bangi*: *Journal of Social Sciences and Humanities*, *17*(7), 89-104.

Echendu, A.J. (2022). Flooding, food security and the sustainable development goals in Nigeria: An assemblage and systems thinking approach. *Social Sciences*, *11*(2), 59. https://doi.org/10.3390/socsci11020059.

Ebhuoma, E. & Leonard, L. (2021). An operational framework for communicating flood warnings to indigenous farmers in southern Nigeria: A systems thinking analysis. *GeoJournal*, *86*, 2639-2656. https://doi.org/10.1007/s10708-020-10221-4.

Ezugwu, C., Onyekweredike, K., Odumade, A., Ezugwu, C., Ifionu, S., Oloyede, A. & Omunakwe, O. (2022). A review on dam engineering practice and sustainability in Nigeria. *Jurnal Kejuruteraan*, *34*(5), 777-784.

Federal Government of Nigeria (FGN). (2013, December 3). *NIGERIA post-disaster needs assessment 2012 floods.* Retrieved from https://www.gfdrr.org/sites/default/files/publication/pda-2012-nigeria.pdf.

Godwins, O.P., Ochagwuba, E., Idoko, I.P., Akpa, F.A., Olajide, F.I. & Olatunde, T.I. (2024). Comparative analysis of disaster management strategies and their impact on nutrition outcomes in the USA and Nigeria. *Business and Economics in Developing Countries (BEDC)*, *2*(2), 34-42. http://doi.org/10.26480/bedc.02.2024.49.60.

Hallegatte, S., Vogt-Schilb, A., Rozenberg, J., Bangalore, M. & Beaudet, C. (2020). From poverty to disaster and back: A review of the literature. *Economics of Disasters and Climate Change*, *4*, 223-247.

Hou, Y., Wei, Y., Wu, S. & Li, J. (2023). Mapping the Social, Economic, and Ecological Impact of Floods in Brisbane. *Water*, *15*(21), 1-21. https://doi.org/10.1007/s41885-020-00060-5.

Hussain, M., Khadim, K., Aslam, H. & Ghufran, M. (2023). An Analysis of Dropout Rate of Students after Flood at Secondary Level District Rajanpur Multan. *Pakistan Journal of Humanities and Social Sciences*, *11*(1), 144-152. https://doi.org/10.52131/pjhss.2023.1101.0336.

Hussaini, A. & Matazu, B.M. (2023). An overview of key improvements by the Nigerian Meteorological Agency for the modernisation of Meteorological Services in Nigeria. *Science World Journal*, *18*(1), 152-157. https://www.scienceworldjournal.org/article/view/23560

Ibeabuchi, U. (2023). Mapping Seasonal Flood Inundation and Developing an Early Warning System for Lagos Metropolis (Nigeria): A study between 1990 and 2011. *Water and Environmental Sustainability*, *3*(2), 48-67. https://doi.org/10.52293/WES.3.2.4867.

Ibrahim, U.A., Tumbe, T.J. & Muhammad, H. (2024). Assessment of Flooding Impact of River Ngadda in Borno State. *Unizik Journal of Engineering and Applied Sciences*, *3*(2), 614-619. https://journals.unizik.edu.ng/index.php/ujeas

IgudaLadan, S. & Saulawa, J.Y. (2021). Flood disaster response and recovery in Nigeria: a case study of 2018 Jibia flood disaster, Katsina State. *Journal of Environmental Science, Toxicology and Food Technology*, *15*(4), 08-18. https://doi.org/10.9790/2402-1504010818.

Ikiriko, T. D. & Gbarabe, F.O. (2024). Economic and social costs of flood disasters in Nigeria: Implications for sustainable national development. *Global Journal of Engineering and Technology Advances*, *19*(01), 091-103. https://doi.org/10.30574/gjeta.2024.19.1.0043.

Katyal, A. K., & Petrisor, I. G. (2011). Flood management strategies for a holistic sustainable development. *Environmental Forensics*, *12*(3), 206-218. https://doi.org/10.1080/15275922.2011.595051.

Lamptey, B., Sahabi, A. S., Gudoshava, M., Mutemi, J., Bopape, M.J., Adefisan, E.A., Igri, M. P., Seidou Sanda, I., Ndiaye, O., Parker, D.J. & Dougill, A. J. (2024). Challenges and ways forward for sustainable weather and climate services in Africa. *Nature Communications*, *15*(1), 1-4. https://doi.org/10.1038/s41467-024-46742-6.

Lawanson, O. I., Proverbs, D. & Ibrahim, R. L. (2023). The impact of flooding on poor communities in Lagos State, Nigeria: The case of the Makoko urban settlement. *Journal of Flood Risk Management*, *16*(1), 1-16. https://doi.org/10.1111/jfr3.12838.

Le Dé, L. (2024). Bridging gaps between disaster risk reduction and drowning prevention. *International Journal of Disaster Risk Reduction*, *106*, 1-10. https://doi.org/10.1016/j.ijdrr.2024.104445

Louw, E., Olanrewaju, C. C., Olanrewaju, O. A., & Chitakira, M. (2019). Impacts of flood disasters in Nigeria: A critical evaluation of health implications and management. *Jàmbá: Journal of Disaster Risk Studies*, *11*(1), 1-9. https://doi.org/10.1016/j.ijdrr.2024.104445.

Mavuso, M. P., Khalo, X., Kafu-Qavane, B. P., & Olawumi, K. B. (2022). Strategies used by Secondary Teachers in Integrating Climate Change Education in their Lessons: Toward a Framework for Combating Climate Change through Education. *e-Bangi: Journal of Social Sciences and Humanities*, *19*(3), 179-191.

Medicins Sans Frontiers. (2024, December 4). Fears of outbreaks grow after severe floods in Nigeria. Retrieved from https://www.doctorswithoutborders.org/latest/fears-outbreaks-grow-after-severe-floods-nigeria

Mfon, I. E., Oguike, M. C., Eteng, S. U. & Etim, N.M. (2022). Causes and effects of flooding in Nigeria: A review. *East Asian Journal of Multidisciplinary Research*, *1*(9), 1777-1792. https://doi.org/10.47191/ijsshr/v5-i10-16.

Nche, G. C. (2024). 'We need rain to survive, but it shouldn't be too much': a tale of flood victims in Kogi State, Nigeria. *Cogent Social Sciences*, *10*(1), 1-19. https://doi.org/10.1080/23311886.2024.2350140.

Nkiruka, E. M., Chinedu, A. D., & Smart, U. N. (2023). Landuse, landcover change dynamics and flooding in the lower Niger basin Onitsha, South Eastern Nigeria. *Land Use Policy*, *131*, 106748. https://doi.org/10.1016/j.landusepol.2023.106748.

Nkwunonwo, U. C. (2020). Current issues in early warning and development initiatives towards enhanced flood-related resilience in Nigeria. In G, Huang. (Ed). *Flood Impact Mitigation and Resilience Enhancement*, (pp. 87-102). https://doi.org/10.5772/intechopen.91247

Obi, R., Nwachukwu, M.U., Okeke, D.C. & Jiburum, U. (2021). Indigenous flood control and management knowledge and flood disaster risk reduction in Nigeria's coastal communities: An empirical analysis. *International Journal of Disaster Risk Reduction*, *55*, 1-10. https://doi.org/10.1016/j.ijdrr.2021.102079.

Odunsi, O.M., Olawuni, P.O., Daramola, O.P., Olugbamila, O.B., Odufuwa, B.O., Onanuga, M.Y., Salisu, U.O., Fasina, S.O. & Momodu, S.O. (2024). Households' resilience to flood disaster in Lagos State, Nigeria: developing a conceptual framework unifying disaster resilience components and dimensions. *Journal of Environmental Studies and Sciences*, *14*(1), 69-86. https://doi.org/10.1007/s13412-023-00864-3.

Odiana, S., Mbee, D. M., & Akpoghomeh, O. S. (2022). An Overview of Flood Disaster Management in Nigeria. *Society for Experimental Biology in Nigeria, 23*(1), 19-28. http://www.niseb.org/afs

Odufuwa, B. O., Oludare, A. H., & Oladesu, J. O. (2012). Floods of fury in Nigerian cities. *Journal Sustainability Development*, *5*(7), 69. http://dx.doi.org/10.5539/jsd.v5n7p69.

Ogbodo, J. A. & Ogbodo, J. I. (2021). Analyzing the progress, pitfalls and prospects for attaining environmental-related sustainable development goals in Nigeria. *Animal Research International*, *18*(1), 3990-4004.

Ogunkoya, O. *O.* (2022, December 4). *Nigeria floods: Government's mismanagement of dams is a major cause. The Conversation.* https://phys.org/news/2022-10-nigeria-mismanagement-major.html

Ogunleye, O., Arohunsoro, S. & Ibitoye, O.A. (2023). Disaster vulnerability and poverty level among residents of Lagos state, Nigeria. *International Journal for Disaster and Development Interface*, *3*(2), 1-18.

Ojo, B. & Emmanuel, E.O. (2024). Evaluating Highway Drainage Systems for Flood Mitigation: A case study of the Benin-Auchi expressway in Esan West, Edo State. *Journal of Scientific and Engineering Research*, *11*(4), 133-153.

Okoye, E. A., Ezejiofor, A. N., Nwaogazie, I. L., Frazzoli, C., & Orisakwe, O. E. (2023). Polycyclic aromatic hydrocarbons in soil and vegetation of Niger Delta, Nigeria: Ecological risk assessment. *Journal of Toxicology*, *2023*(1), 8036893. https://doi.org/10.1155/2023/8036893.

Okunola, O.H. & Werners, S.E. (2024). A multi-dimensional framework for assessing disaster recovery pathways: Lessons and experiences from Germany and Nigeria. *International Journal of Disaster Risk Reduction*, *112*, 1-18. https://doi.org/10.1016/j.ijdrr.2024.104777.

Okwulu, O., Laraba, O. E., Ebimoboere, L. O. J., & Idhomi, A. (2024). Farmers-herders rivalry and its implications for food security and household income in Nigeria: Interrogating the trending issues. *Journal of Policy and Development Studies (JPDS)*, *16*(1), 194-208. https://dx.doi.org/10.4314./jpds.v16i1.11

Olaniyan, F.A. (2024). Community flood preparedness in a collectivist cultural context: lessons from Ibadan, Nigeria. *African Geographical Review*, 1-12. https://doi.org/10.1080/19376812.2024.2318748.

Olunusi, B.O. (2024). Overview of climate-induced food insecurity in Nigeria. *African Journal of Food Science, 18*(5), 69-76. *https://doi.org/10.5897/AJFS2024.2306.*

Onyeaka, H., Nwauzoma, U.M., Akinsemolu, A.A., Tamasiga, P., Duan, K., Al-Sharify, Z.T. & Siyanbola, K.F. (2024). The ripple effects of climate change on agricultural sustainability and food security in Africa. *Food and Energy Security*, *13*(5), 1-15**.** https://doi.org/10.1002/fes3.567.

Otekunrin, O.A. (2024). Assessing the prevalence and severity of global hunger and food insecurity: recent dynamics and Sub-Saharan Africa's burden. *Sustainability*, *16*(12), 1-21. https://doi.org/10.3390/su16124877.

Perera, D., Agnihotri, J., Seidou, O. & Djalante, R. (2020). Identifying societal challenges in flood early warning systems. *International Journal of Disaster Risk Reduction*, *51*, 1-9. https://doi.org/10.1016/j.ijdrr.2020.101794.

Rawlins, J. & Kalaba, F.K. (2020). Adaptation to climate change: Opportunities and challenges from Zambia. *African Handbook of Climate Change Adaptation*, 1-20. https://doi.org/10.1007/978-3-030-42091-8_167-1.

Reed, C., Anderson, W., Kruczkiewicz, A., Nakamura, J., Gallo, D., Seager, R. & McDermid, S.S. (2022). The impact of flooding on food security across Africa. *Proceedings of the National Academy of Sciences*, *119*(43). https://doi.org/10.1073/pnas.2119399119.

Ringo, J., Sabai, S. & Mahenge, A. (2023). Performance of early warning systems in mitigating flood effects. A review. *Journal of African Earth Sciences*, 105134. https://doi.org/10.1016/j.jafrearsci.2023.105134.

Siders, A., Niemann-Morris, J., Hino, M., Shields, E., Cano Pecharroman, L., Doeffinger, T., Gerber-Chavez, L., Huang, J.C., Lafferty, A., Tamima, S. & Williams, C. (2024). How local governments avoid floodplain development through consistent implementation of routine municipal ordinances, plans, and programs. *Oxford Open Climate Change*, *4*(1), 1-11. https://doi.org/10.1093/oxfclm/kgae017.

Shakeri, E., Vizvari, B. & Nazerian, R. (2021). Comparative analysis of disaster management between India and Nigeria. *International Journal of Disaster Risk Reduction*, *63*, 102448. https://doi.org/10.1016/j.ijdrr.2021.102448.

Singh, P., Tabe, T. & Martin, T., 2022, January. The role of women in community resilience to climate change: A case study of an Indigenous Fijian community. In *Women's Studies International Forum*, 90, 102550, Pergamon. https://doi.org/10.1016/j.wsif.2021.102550.

Suleiman, U.Y., Daura, A.H. & Liberty, F.S. (2023). Public policy inconsistency and economic development in Nigeria. *UBS Journal of Business and Economic Policy*, *1*(3), 148-160. https://journals.unizik.edu.ng/index.php/ubsjbep

Sriram, D., Dorasamy, N., & Vipul, N. (2022). Disaster management in India: Need for an integrated approach. *Disaster Advances, 15*(8), 60-68.

The Punch. (2024, December 4). FG writes govs as agency predicts flooding in 31 states. *The Punch*. https://punchng.com/fg-writes-govs-as-agency-predicts-flooding-in-31-states/

The World Food Programme. (2024, December 4). *WFP and Borno Government provide hot meals to people displaced by the worst floods in 30 years in northeast Nigeria*. https://www.wfp.org/news/wfp-and-borno-government-provide-hot-meals-people-displaced-worst-floods-30-years-northeast

The World Health Organization (2024, December 2). *Ramping up flood emergency response in Nigeria.* https://www.afro.who.int/countries/nigeria/news/ramping-flood-emergency-response-nigeria (Accessed December 2, 2024).

Uba, M.I. (2024). Assessing Natural Disaster and Sustainable Infrastructure development: A case study of flood resilience and mitigation strategies in Maiduguri Nigeria. *International Journal of Advances in Engineering and Management, 6*(10), 244-249. https://doi.org/10.35629/5252-0610244249

Ude, A., Walter, I. & Eneh, I. (2024). Interrogating Disaster Management in the South East Nigeria: Problems and way forward. *NG Journal of Social Development*, *14*(1), 181-205. https://dx.doi.org/10.4314/ngjsd.v14i1.12.

UNHCR. (2024, December 4). *UNHCR scrambles aid as devastating floods sweep Nigeria.* https://www.unhcr.org/news/briefing-notes/unhcr-scrambles-aid-devastating-floods-sweep-nigeria.

Ughulu, E.S. and Igabor, O.T. (2021). Applicability of emergency management theory in the management of Covid-19 health pandemic in Nigeria. *Global Journal of Social Sciences*, *20*(1), 87-97. https://doi.org/10.4314/gjss.v20i1.9.

Umar, N. & Gray, A. (2023). Flooding in Nigeria: a review of its occurrence and impacts and approaches to modelling flood data. *International Journal of Environmental Studies*, *80*(3), 540-561. https://doi.org/10.1080/00207233.2022.2081471.

Week, D.A. & Wizor, C.H. (2020). Effects of flood on food security, livelihood and socio-economic characteristics in the flood-prone areas of the core Niger Delta, Nigeria. *Asian Journal of Geographical Research*, *3*(1), 1-17. https://doi.org/10.9734/ajgr/2020/v3i130096