







Nigeria's Flood Disaster Unpreparedness: Impacts on Health and the Society

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Abstract

Floods in Nigeria have been a perennial problem for over 60 years, occurring during the rainy season. Some causes include climate change, housing development on flood plains, poor urban drainage systems, and under-damming. The 2022 nationwide flooding crisis worsened Nigeria's poverty, food insecurity, and gendered vulnerabilities. Floods are associated with the loss of lives and properties, which exacerbate psychosocial stressors and threaten the resilience of residents. This paper explores the health and economic perspectives of the floods and examines Nigeria's preparedness for future recurrences. It highlights the health implications of flooding, such as waterborne diseases and psychosocial issues, and pandemic preparedness. We advocate for community-based early warning systems, disaster risk mapping, and operationalising the National Disaster Management Framework to address these challenges. Urgent action is essential to strengthen the resilience of communities against the brewing threats on their shores.

Keywords: Floods, Climate change, Disasters, Resilience, Nigeria

Introduction

Resilience is a psychological phenomenon, serving as a protective adaptation to significant stressors for improving mental functioning and general well-being.¹ Disasters have far-reaching impacts that can be traumatic, potentially affecting vulnerable groups adversely. Disaster resilience is a measurable concept that underscores the intersection between exposure to disaster risk and the availability of systems to enable those vulnerable communities to adjust and cope with adversity.^{1,2} With a brewing threat on our shores, Nigeria faces an imminent crisis that could further strain the resilience of her people.^{2,3}

The Flooding Crisis in Nigeria

Flooding is a significant rise in water bodies or reservoirs that inundates dry land, affecting human activity, health, and well-being.^{4,5} Nigeria experiences three common types of floods: fluvial, coastal, and pluvial.⁶ Fluvial flooding occurs in regions adjoining major rivers (Niger, Benue, Kaduna, Hadeja); Coastal floods are prevalent in southern coastal states (Ondo, Lagos, Oyo, Bayelsa) due to their low elevation above sea level; Pluvial floods are caused by frequent and severe rainfall, inundating both urban and rural areas by exceeding the infiltration capacity and drainage systems.^{4,6} Nigeria's flooding occurs during the rainy season due to flash floods or pluvial floods.^{6,7}

Within 30 years (1984-2014), flooding disrupted the lives of 11 million people, causing over 1100 deaths and damaging assets worth over \$17 billion.^{6,7} The 2012 floods were the worst in Africa and the 4th most devastating worldwide.⁵⁻⁷ A decade later, Nigeria faced a more catastrophic flood, submerging towns or communities in 34 out of 36 states for several months.^{7,8}

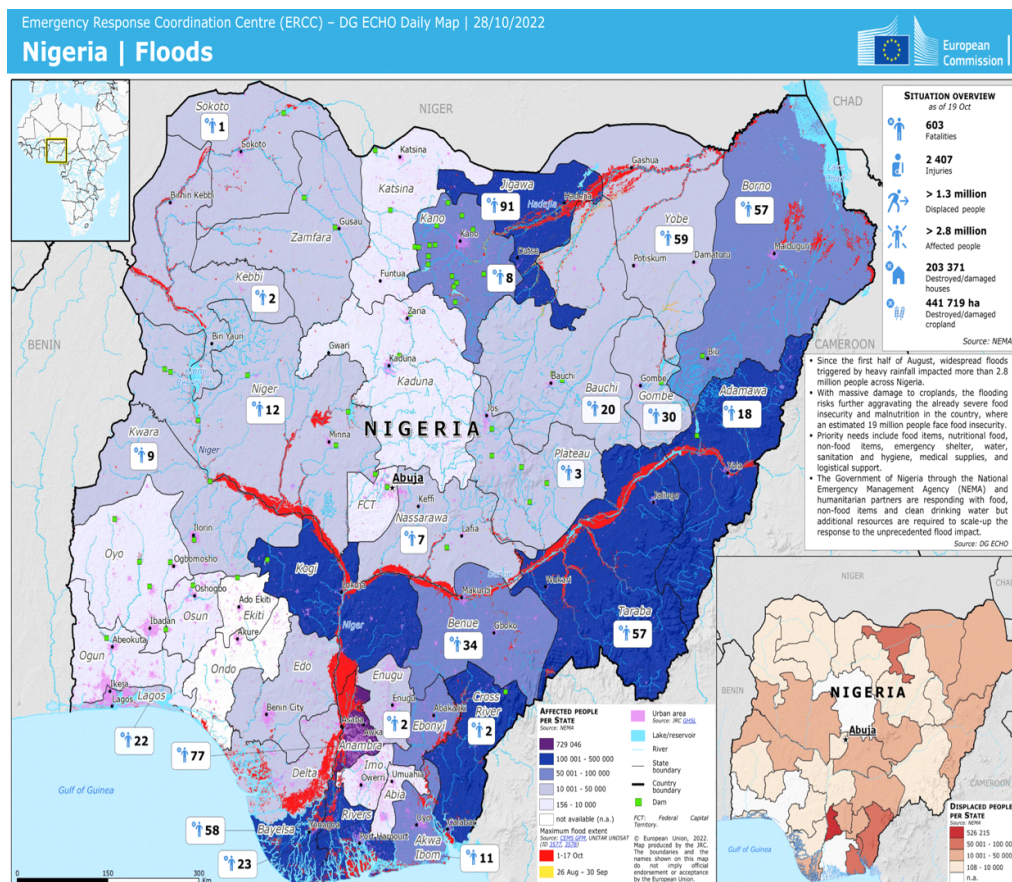


Figure 1: Infographic showing the impact of the 2022 floods by 28TH OCTOBER, 2022

Source: The Emergency Response Coordination Centre, European Union

With approximately 300,000 homes and over 500,000 hectares of farmlands destroyed, flooding exacerbated food insecurity amidst the broader economic hardships the country was already experiencing.^{7,8} Verifiable resources estimated that around 1.5 million people were displaced, and the floods directly impacted 3.2 million individuals.^{7,8} The death toll exceeded 600, and over 2400 people sustained varying injuries.^{7,8} The worst-hit states were Kogi, Jigawa, Anambra, Rivers, Bayelsa and Adamawa.^{3,7,9} With another flooding imminent, the country remains ill-prepared.⁶

Causes of the Flooding Crisis

Controversy about the causes of flooding has hampered efforts to mitigate the risks through public awareness and disaster preparedness.¹⁰

Data reveals that the large-scale 2022 floods began in Nigeria as early as June, spreading to neighbouring countries, including Chad, Cameroon, and The Benin Republic which started experiencing floods by September.⁸ These floods resulted from rainfall exceeding historical patterns, exacerbated by frequent short spikes that triggered flash floods in some areas.^{8,10} Poor urban planning with drainage systems, proliferation of housing development in flood plains, and inadequate national water management are other causes.^{6-8,10} Although the exact impact of water release from the Lagdo Dam in Cameroon is yet to be determined, data suggests its contribution is minimal.^{7,8,10} A 2022 World Weather attribution report highlighted climate change and global warming as contributing factors to the floods.⁸

Governmental inaction impeded Nigeria's ability to mitigate the impact of water release from the Lagdo Dam in Cameroon. Numerous towns along the River Niger and its tributaries continue to grapple with devastating floods, primarily due to the government's failure to construct two essential dams in Dasin Village, Fufore, Adamawa State.^{8,10} About 40 years ago, the Federal Government agreed to build these bumper dams designed to contain the flow from Lagdo Dam to protect the neighbouring communities from fluvial floods.^{8,10,11} Rather, the country relies on other dams like Shiroro and Kainji, which retain a certain amount of water for hydroelectric power generation and overflow themselves during peak rainy periods.¹¹ Successive governments neglected the project despite the operational status of the Lagdo Dam since 1982.^{10,11} Dr. Emmanuel Adamu, a former Director of Dams, expressed concern over the urgent need for these dams in the aftermath of the 2012 floods, blaming it on the Government's failure.¹⁰ Nonetheless, he indicated that the Nigerian Government had initiated measures to construct these critical dams, but a decade later, these plans have not materialised.¹⁰

Where Nigeria Currently Stands

Nigeria is now facing a dire humanitarian crisis, and the situation is only worsening; with over 60% of the population living in extreme poverty, currency depreciation triggered by inflation, scarcity of essential services, disregard for the rule of law, looming threat of climate change, compromised security, and rising criminality, The Country's challenges are mounting.^{12,13} Tackling these challenges is complicated by differences in vulnerabilities and resilience, as some groups are more exposed in the event of a crisis and bear the brunt of a shortage of mitigation strategies.^{2,12,13} There is an apparent lack of capacity to adequately address the flooding, as local agencies lack proper monitoring, disaster prediction, and risk modelling systems deployed in advanced climates for risk reduction and preparedness.^{6,8} Nigeria's Emergency Management Agency (NEMA) is yet to actualise its founding objectives. Although they currently engage in environmental planning, policy-making, and public education, they are more active in the aftermath of the disaster than in effectively preventing or reducing risk.^{6,8} The lack of a proactive outlook makes these agencies prone to being overwhelmed and unable to cater to the large-scale impact of disasters.^{8,9}

Undeterred by the Country's reactionary approach to disasters, the Nigerian Meteorological (NiMET) Agency has stayed true to its mission of observing, researching, and reporting data on

various meteorological indices and alertness. NiMET publishes data and weekly forecasts on its website, including places at risk of flash floods, but there is a gap in risk communication as many Nigerians remain unaware.³ Those who become aware of the risk are unsure of how to respond, frustrating the objective of disaster preparedness.

Global efforts to combat disasters have prioritized disaster preparedness and risk mitigation.^{6,8} However, many Nigerian states are unprepared for the subsequent flooding crisis, which is predicted to be worse than previous floods. Nine states, including Lagos, Akwa Ibom, and Yobe, made no budgetary allocations for floods and erosion control in 2023, and 18 other states who had budgeted for flooding made zero implementation of the budget within the first quarter of 2023, despite suffering the impacts of floods in 2022.^{8,9}

States that earmarked funds for flood and erosion control in their 2023 budget and amount budgeted (N'Million)

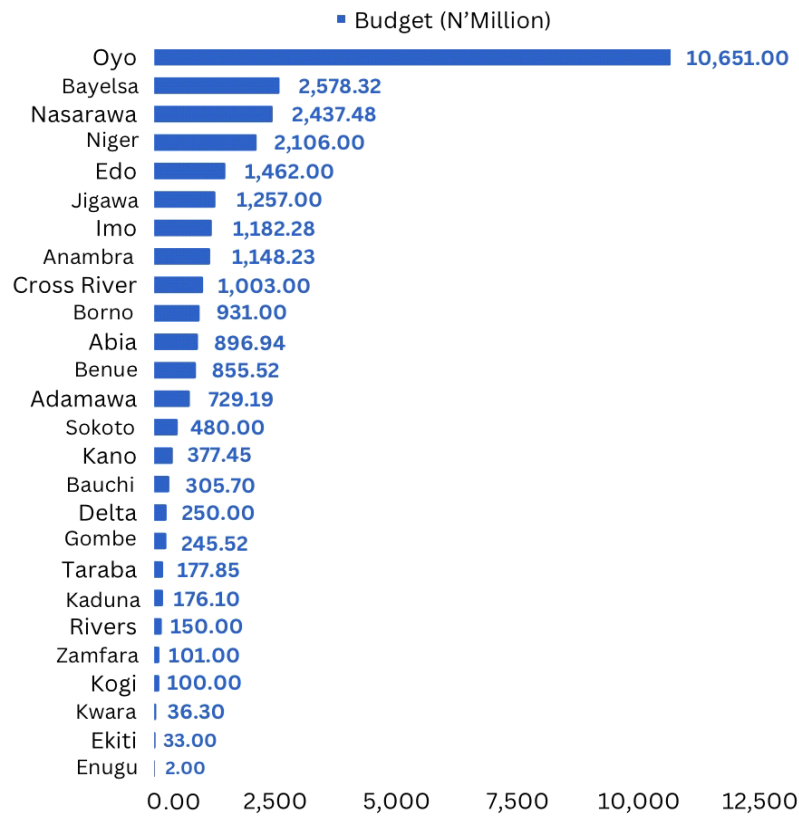


Figure 2: States that earmarked funds for flood and erosion control in their 2023 budget and amount budgeted

Credits: Datapyhte

HOW STATES PERFORMED ON THEIR 2023 BUDGET FOR EROSION AND FLOOD CONTROL IN Q1 2023

- At the end of Q1 2023, only 7 states in Nigeria implemented a part of their budget for flood and erosion control.

STATE	BUDGET FOR EROSION AND FLOOD CONTROL	AMOUNT SPENT IN Q1	% PERFORMANCE
Delta	305.7 M	177.94 M	58.21%
Abia	931 M	305.70 M	32.84%
Jigawa	1.46 Bn	402.55 M	27.53%
Ekiti	36.3 M	8 M	22.04%
Bayelsa	10.65 Bn	1.93 Bn	18.08%
Kaduna	177.85 M	28.41 M	15.97%
Edo	2.11 Bn	12.75 M	0.61%
Oyo	16.29 Bn	0	0.00%
Nasarawa	2.58 Bn	0	0.00%
Niger	2.44 Bn	0	0.00%
Imo	1.26 Bn	0	0.00%
Anambra	1.18 Bn	0	0.00%
Cross River	1.15 Bn	0	0.00%
Borno	1 Bn	0	0.00%
Benue	896.94 M	0	0.00%
Adamawa	855.52 M	0	0.00%
Kano	480 M	0	0.00%
Bauchi	377.45 M	0	0.00%
Gombe	250 M	0	0.00%
Taraba	245.52 M	0	0.00%
Zamfara	150 M	0	0.00%
Kogi	101 M	0	0.00%
Kwara	100 M	0	0.00%
Enugu	33 M	0	0.00%
Ebonyi	2 M	0	0.00%

Table: Datapyhte - Source: States Q1 Budget Implementation Reports.

Figure 3: How States Performed On Their 2023 Budget For Erosion and Flood Control in Q1 2023

Credits: Datapyhte

In June 2023, the Nigerian Hydrological Service Agency (NIHSA) condemned the State governments for their lack of interest in stakeholder disaster preparedness meetings.¹¹ Nigeria is also significantly under-dammed, with only 408 dams, most of which are not operational due to silt build-up, while the country requires thousands of dams.¹¹

Despite formal agreements on risk communication between Nigeria and Cameroon, there is poor transboundary collaboration.^{8,10} NIHSA coordinates information with the hydrological agency of Cameroon regarding early notification of water release from its Lagdo Dam. Still, the agency's leadership has decried the lack of synergy from Cameroon, as they learned about the release only after they investigated the causes of sudden local floods along the River Niger's path.⁸ This lack of Disaster Risk Communication can impact other areas of disaster mitigation, including accessing multilateral climate funds available to countries that utilise transboundary disaster collaboration as a criterion.⁸

The response to flood victims is unsatisfactory, as it has taken more than a year for the Nigerian Government to pass legislation to provide ₦19.2 Billion to those who have lost their farmlands - a grossly insufficient figure. Warnings from NiMET and NIHSA that 32 states are at risk of being affected in 2023 are causing panic among residents.^{3,11} Those in flood-prone areas bear the brunt of their state government's failure to prioritise their safety and well-being.³ The poor state of Internally Displaced Persons (IDP) camps, lack of public storage facilities, and lack of Government will to dredge rivers have only worsened the situation.³ However, some states have taken steps to address the issue - Kaduna has dredged the Kaduna River and provided

unconditional cash transfers to households, Kano has begun mass enlightenment in all 44 local government areas, and Anambra state has commenced preparation of makeshift IDP camps.³

The Gender Dimensions of Flooding

Does gender or gender roles play a role in determining vulnerability to disasters? A study suggests that the intersection of gender roles, class, place, employment status, and social entitlements such as health care ultimately determines differential vulnerability.^{2,8,13} Intrinsically, gender is not a predictor of disaster vulnerability or resilience, except in the context of preexisting social inequalities like income and gender disparity and rural-urban resource inequality.^{2,8} In the aftermath of the 2011 Lagos floods, a study found that the most socially and economically marginalised, such as poor, unemployed Nigerian women, were at a greater risk of suffering the negative impacts.^{2,13} This has prompted a need for a holistic approach to disaster risk reduction policies that takes into account the economic, social, productive, and reproductive roles played by women.^{2,13}

The United Nations Office for Coordination of Humanitarian Affairs (OCHA) agrees that Gender inequality is significant in determining vulnerability, exposing women and children to heavier impacts during conflicts.¹² Women and girls are particularly affected due to discriminatory laws, and reduced roles in decision-making.^{2,4,10} Unfortunately, they often face more challenges accessing necessary assistance and protection than men and boys.² Recognising and addressing these disparities is crucial for ensuring a more equitable and inclusive approach to humanitarian relief efforts.⁸

Economics of Flooding Disaster

The Nigerian Ministry of Humanitarian Affairs collaborated with the World Bank for a post-disaster assessment of the economic impact of the 2022 floods. They deployed the Global Rapid Post Disaster Damage Estimation (GRADE) Technology for the first time in sub-Saharan Africa.¹⁴ For the period of review between June-November 2022, estimates of total direct economic damages were between \$3.79 billion to \$9.12 billion, with a median estimate of \$6.68 billion, about 1.4% of Nigeria's GDP as published by the World Bank.^{14,15}

In 2022, five million Nigerians fell into poverty, disproportionately affecting women, comprising two-thirds of the poorest Nigerians.^{12,13} OCHA reports that more persons are expected to drop below the poverty line despite a projected 2.9% economic growth in 2023 due to the catastrophic nationwide flooding crisis of 2022 and a decline in oil production.¹² While Nigerians are struggling to cope with a recent hike in fuel pump prices following the Government's petrol subsidy removal, another flooding disaster will exacerbate hardship. Previous floods typically cut off petroleum transportation to Northern Nigeria; this would cause fuel scarcity, more queues at petrol stations, and trigger inflation of prices of goods and services in a region that already suffers insurgency and forced displacement.^{3,10,12}

Inflation is another severe economic problem, as at in September 2022, the inflation rate soared to 22%, and food prices increased by 23%.¹² The destruction of farmlands and harvest disruption by flooding threatens food security and can further worsen the inflation of food prices.^{7,16} Twenty-five million Nigerians are projected to be food insecure in the lean season of 2023; this would disproportionately affect farmer populations in the North whose farming activity is not just a source of food but also a means of income and sustenance. However, they are forced to migrate to safety, disrupting their farming activities.^{12,16}

The Health Implications

Resilience protects mental well-being, and with increased adversity and stressors, Nigerians become more susceptible to anxiety, depression, and other psychosocial issues.^{1,2} The loss of livelihood, homes and property, poverty, and inflation are psychosocial stressors that impact their resilience and leaves them more vulnerable, especially without sociopolitical arrangements to cushion the impacts and enable individuals to cope or thrive.^{2,8} Flooding has been linked to the transmission of waterborne and vector-borne diseases such as cholera, typhoid, cryptosporidiosis, non-specific diarrhoea, rotavirus, paratyphoid, and malaria.^{5,7,8} The devastating 2022 floods hit 31 states already grappling with a Cholera epidemic, a disease that had resulted in over 460 deaths.⁷ As of July 2023, the Nigeria Centre for Disease Control (NCDC) website shows that 2052 cases of suspected cholera with a case fatality ratio of 2.7% have been reported in 24 states in the first 26 Weeks of 2023; another flooding disaster could make the outbreak worse.¹⁷ Cross River alone contributes about 25%, while Katsina, Abia, Bayelsa, Ebonyi, Zamfara, and Niger collectively contribute 57% of cases. Most of these states are prone to floods which can escalate the number of cases and force migration and disease transmission to areas with no record of outbreaks.^{4,9,17} The proliferation of pathogens and surface water contamination leads to a surge in diarrheal disease cases after flooding.^{5,12} Flood water carries faecal matter, debris, and other pollutants, causing increased skin diseases and Onchocerciasis, which could cause blindness.⁵ Cases of leptospirosis and rodent infestation are also common.⁵

During a flood disaster, women and children are particularly vulnerable; others are the elderly and disabled, with the latter suffering disproportionately from a lack of consideration for their unique needs during interventions.¹² In many IDP camps, women's privacy, safety, and dignity are severely compromised, heightening the risk of harassment, sexual assault, and other forms of gender-based violence.^{2,3,12} Furthermore, the lack of sanitary products and convenient places to relieve themselves can lead to a deterioration of personal hygiene, with women suppressing the urge to urinate for extended periods, putting them at risk of developing urinary tract infections.^{2,12} Children are exposed to increased transmission of diseases like acute diarrhoea, typhoid fever, malaria, and measles, all of which have a potential for significant morbidity and mortality in the context of limited resources during flood disasters.^{5,12} Food insecurity exacerbated by flooding raises the risk of childhood malnutrition.¹² Due to existing humanitarian challenges, the floods will worsen the fate of two million children projected to be malnourished in Bornu, Adamawa, and Yobe states in 2023.^{12,16} Children may be exposed to other negative experiences such as child marriages and dropping out of school.¹² Nigeria currently has 19.7 Million out-of-school children, making it the third globally for out-of-school children after India and Pakistan according to rankings by the United Nations Educational, Scientific and Cultural Organization (UNESCO).¹² Nigeria currently struggles with a fragile health system, battling inadequacies, poor funding and remuneration, lack of facilities, a weak disease surveillance system, and misinformation in the media.⁵ A flooding disaster further weakens the health system, as some facilities are destroyed, health-worker distribution becomes uneven, and disease outbreaks occur.^{5,12} Massive national emergencies like flooding will impact Nigeria's capacity to handle subsisting health emergencies. Another flooding disaster will deplete resources to mitigate the spread of anthrax, diphtheria, and Lassa fever outbreaks.^{5,12} It is crucial to note that disease outbreaks commonly occur as post-flood events, when health services initially mobilised for disaster relief is withdrawn.^{5,8}

The Way Forward

Flood events can be devastating, and resilience involves a complex combination of factors. When people are exposed to the risk of flooding, the availability of socio-political arrangements that increase their ability to cope with and adapt to these hazards or external stress plays a role in

determining resilience.^{2,3}

Community-based early warning systems and the formulation of an Early Action Protocol (EAP) lead to better disaster preparedness and reduces the losses from hazards in advanced climes, and this is highly recommended for adoption in Nigeria.^{4,6,8} To enable local emergency response agencies to actualise their constitutional and operational mandate, the country must increase its capacity for disaster preparedness and community resilience by adequately funding these institutions.^{6,9} Moreover, early public-private sector collaboration for humanitarian aid should be encouraged during disaster preparedness operations, not only when the crisis exceeds the capacities of government agencies.⁶

The United Nations Office for Disaster Risk Reduction (UNDRR) recommends disaster risk mapping, vulnerability assessment for lives and property, and the utilisation of geographic information system (GIS), hydrodynamic, cellular automata, and statistical techniques as tools for preparedness.^{6,7,12} The Nigerian Hydrological Service Agency (NIHSA) has already prepared flood risk mapping for the South-South and South-West regions, all states should collaborate with the agency to produce hazard maps and strengthen the institutional framework of their state emergency management agencies (SEMA).¹¹ Fully operationalising the National Disaster Management Framework (NDMF) by optimising NEMA is crucial. NEMA and sub-national agencies must prioritise improved data acquisition and disaster prevention efforts.⁶ Establishing makeshift shelters on high grounds, providing amenities for safe waste disposal, and addressing potential overcrowding are necessary measures to be taken urgently.^{3,6,12} Additionally, the health-related implications of flooding, such as the spread of waterborne diseases, increased psychosocial stress, and the burden of anxiety and depression, must be considered.^{3,5}

Government must protect communities near major rivers from recurring flood episodes by constructing more dams and dredging rivers to manage the flooding adequately.^{10,11} Urgent action is imperative to ensure the safety and well-being to read those who may be affected by future flood events.⁵ Providing storage facilities for individuals to safely deposit their properties and retrieve them after the floodwaters recede is vital, as many people would be unwilling to leave all their belongings without assurance of security.³ Lastly, security personnel training and mobilization are crucial for assisting in disaster efforts, protecting persons at IDP camps, and evacuating and securing material assets.⁶

We hope the government will get to work, rallying relevant stakeholders and state governments, pooling resources, and utilising the recommendations in its race against time to save Nigerians from another disaster.

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