CLIMATE CHANGE, FLOODING, AND POPULATION DISPLACEMENT IN NIGERIA: MIGRATION PATTERNS ACROSS STATES

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Abstract
Climate change, induced flooding has emerged as a critical driver of population displacement across Nigeria, affecting millions of people and disrupting livelihoods, food security, and socioeconomic stability. This literature review synthesizes evidence from studies published between 2013 and 2025, examining the patterns, impacts, and consequences of flood-induced displacement across Nigerian states. The 2012 flood disaster, which displaced over 2.1 million people across 30 states, serves as a pivotal reference point in the literature. Key findings reveal that displacement patterns are predominantly temporary rather than permanent, with affected poidentifiedpulations often returning to flood-prone areas due to livelihood dependencies and limited alternatives. The Niger Delta states, particularly Bayelsa, Delta, and Rivers alongside Lagos, Anambra, Kogi, and Akwa Ibom emerge as the most severely affected regions. Women and children are as disproportionately vulnerable groups, facing heightened risks from livelihood disruptions, housing insecurity, and increased caregiving responsibilities. The review highlights significant gaps in policy responses and underscores the need for comprehensive flood management strategies that address both immediate humanitarian needs and long-term adaptation requirements.
Keywords: Climate change, Migration Patterns, Nigeria, Displacement

1. Introduction

Nigeria faces increasing vulnerability to climate change-induced flooding, with devastating consequences for population displacement, livelihoods, and socioeconomic development. The intersection of climate variability, rapid urbanization, environmental degradation, and inadequate infrastructure has created conditions where millions of Nigerians are exposed to recurrent flood disasters. The 2012 flood event, which affected 30 states and displaced over 2.1 million people, marked a watershed moment in understanding the scale and complexity of climate-induced displacement in Nigeria [4]. This disaster, believed to be triggered by climate change and exacerbated by human activities, claimed 363 lives and caused damages worth 2.6 trillion naira [4]. The phenomenon of flood-induced displacement in Nigeria is not merely a humanitarian crisis but a complex socioecological challenge that intersects with issues of environmental security, poverty, food security, and sustainable development. Understanding the patterns, drivers, and consequences of this displacement is essential for developing effective adaptation strategies and policy interventions. This literature review synthesizes evidence from recent scholarship to examine how climate change and flooding shape migration patterns across Nigerian states, with particular attention to the geographic distribution of impacts, the characteristics of displacement, socioeconomic consequences, and the differential vulnerabilities of affected populations

The review draws on peer-reviewed studies published between 2013 and 2025, encompassing empirical research, case studies, and vulnerability assessments from multiple Nigerian states and regions. The analysis focuses on identifying patterns in displacement, understanding the life experiences of affected populations, and highlighting the policy and governance challenges that shape responses to this growing crisis.

2. Geographic Distribution of Flood-Induced Displacement

2.1 Niger Delta Region

The Niger Delta region emerges from the literature as one of the most severely affected areas for flood-induced displacement in Nigeria. The 2012 coastal floods had particularly devastating impacts on this region, with Bayelsa, Delta, and Rivers States experiencing significant displacement and out-migration [1]. The region's vulnerability stems from its low-lying geography, extensive riverine areas, and dependence on natural resources for livelihoods. Bayelsa State, characterized by its riverine topography, has experienced recurring flood events that significantly shape migration decisions, particularly among women [3]. Climate change influences migration through multiple pathways including disrupted livelihoods, flooding, water scarcity, diseases, health challenges, housing insecurity, and uncertain future prospects [3]. The state's flood-prone communities face severe socioeconomic impacts, with flooding affecting income, farmland, food security, traditional crafts, businesses, and essential services including education, health, water supply, and transportation [15]. Women traders in Bayelsa's riverine areas experience particular vulnerabilities from supply chain disruptions, damaged goods, and limited market access, with flood events exacerbating gender inequalities and increasing caregiving responsibilities [16].

Rivers State has also experienced significant flood impacts, with studies documenting effects in specific local government areas. The 2019 flood in Obio/Akpor Local Government Area resulted in monetary costs of ₦2,509,729,000, with sex identified as the most significant factor influencing residents' desire to relocate from flood-prone areas [10]. In Etche Local Government Area, farmland flooding has led to social and economic impacts including depression, stress, loss of farmland and produce, and damage to livelihood systems [5]. Delta State's freshwater and mangrove swamps have experienced climate change-induced agricultural losses and food shortages, with flooding identified as the primary cause of food losses in both ecological zones [12]. Significantly, out-migration accounts for over 65% of respondents' adaptation strategies against climate change-induced food shortage in the mangrove swamps, indicating that population movement serves as a major coping mechanism [12].

2.2 Lagos and Coastal Areas

Lagos, Nigeria's commercial capital and a rapidly growing megacity, faces acute vulnerability to flooding due to its coastal location, low elevation, and rapid urbanization. The 2020 flood incidence displaced over 120,000 persons and killed 68 people, affecting about 40% of local government areas and 97% of states nationwide [7]. Lagos is identified as a flood hotspot with 35 recorded events, particularly concentrated in Victoria Island's Lekki area and in Kosofe, Ikeja, and Agege districts [8]. The impact of flooding on Lagos is particularly severe for poor and low-income communities. The Makoko urban settlement exemplifies how flooding aggravates poverty levels and negatively impacts educational status and community development [11]. Research reveals that income and access to material resources significantly influence people's experiences and ability to cope with flooding, with state failure in providing services and flood protection shaping flood risk patterns [18]. Low-income communities in Lagos employ localized adaptation strategies, particularly through Community Development Associations, though these endogenous resilience forms cannot replace broader urban governance improvements [14], [18].

Flooding in Lagos leads to agricultural land degradation, crop loss, water pollution, erosion, infrastructure damage, poverty aggravation, and public health risks including the spread of infectious diseases [8]. These impacts disproportionately affect vulnerable populations, exacerbating existing socioeconomic challenges [8]. The intersection of rapid urbanization and increased flood risk creates conditions where flooding significantly impacts livelihoods and human health, preventing the urban population from escaping poverty and impeding achievement of Sustainable Development Goals [7].

2.3 Other Affected States

Beyond the Niger Delta and Lagos, several other Nigerian states have experienced significant flood-induced displacement and impacts. Anambra State, particularly Ogbaru Local Government Area, experienced temporary displacement of approximately 2 million people during the major 2012 flood event [2]. The state's low-lying geographic position and extreme wet seasons contribute to heightened flood disasters, with affected communities practicing temporary displacement followed by return to their land as a local risk management strategy [2]. Akwa Ibom State has also experienced flood impacts, with studies in Atan Offot and adjoining communities in Uyo documenting that 24% of sampled households lost their homes due to flooding, 87% experienced damaged crops, and 52% reported impacts on drinking water [13]. The research recommends assisting locals in moving to less flood-prone areas and introducing alternate means of subsistence to address food insecurity [13]. While specific displacement data is limited, other states mentioned in the literature include Kogi State, where flood vulnerability assessments have been conducted in local communities [23], and Jigawa State, where research has examined flood coping strategies [27]. The 2012 flood's impact across 30 states nationwide underscores the widespread nature of flood-induced displacement in Nigeria [4].

3. Patterns and Characteristics of Displacement

3.1 Scale and Magnitude of Displacement

The scale of flood-induced displacement in Nigeria is substantial and has increased over time. The 2012 flood disaster represents the most comprehensively documented event, displacing over 2.1 million people across 30 states and claiming 363 lives [4]. In Anambra State alone, this event temporarily displaced approximately 2 million people [2]. More recent events continue this pattern, with the 2020 flood displacing over 120,000 persons and killing 68 people [7]. These displacement figures represent not isolated incidents but part of a pattern of increasing flood cases leading to livelihood displacement and impoverishment of victims [9]. The monetary costs are substantial, with the 2012 flood causing damages and losses worth 2.6 trillion naira [4], and the 2019 flood in just one local government area of Rivers State resulting in costs of ₦2,509,729,000 [10]. At the household level, 24% of sampled households in flood-affected areas of Akwa Ibom State lost their homes entirely [13]. The literature indicates that flooding severity, intensified by climate change, significantly impacts daily human mobility patterns [6]. This increased mobility during flooding seasons has complex implications, including influences on public health outcomes such as disease transmission [6]. The scale of displacement creates challenges at the intersection of natural disasters and public health, underscoring the need for national-scale flood management planning [6].

3.2 Temporary versus Permanent Migration

A critical finding across multiple studies is that flood-induced displacement in Nigeria is predominantly temporary rather than permanent. In Anambra State, communities practice returning to their land after floods as a local risk management strategy, highlighting temporary displacement patterns rather than permanent migration [2]. This pattern reflects the strong attachment to land and livelihoods that characterizes many flood-affected communities. However, the temporary nature of displacement does not diminish its impacts. Climate-driven temporary displacement leads to loss of shelter, breakdown of livelihoods, decreased socioeconomic activities, and affects health and well-being [2]. The cyclical pattern of displacement and return creates ongoing vulnerabilities, as communities repeatedly experience disruption without achieving long-term security. Despite the predominance of temporary displacement, there is evidence of more permanent migration patterns in some contexts. In Delta State's mangrove swamps, out-migration accounts for over 65% of respondents' adaptation strategies against climate change-induced food shortage, suggesting more sustained population movement as a coping mechanism [12]. In Bayelsa State, research documents women who have fled floods, remain displaced, and opted not to return to prevent future negative experiences, indicating that some displacement becomes effectively permanent [3]. The willingness to relocate permanently varies by context and individual factors. In Rivers State, analysis showed that sex of respondents was the most significant factor influencing residents' desire to relocate from flood-prone areas, though the combined factors explained only 4.059% of the desire to relocate, suggesting that most residents are reluctant to permanently leave despite flood risks [10].

3.3 Gender Dimensions of Displacement

Gender emerges as a critical dimension of flood-induced displacement, with women and children identified as the most vulnerable groups [7]. Climate change significantly shapes the migration decisions of women in riverine areas through disrupted livelihoods, flooding, water scarcity, diseases, health challenges, housing insecurity, increased environmental vulnerabilities, and uncertain future prospects [3]. Women traders in riverine areas face particular challenges from climate change-induced flooding, including livelihood disruptions, economic disparities, supply chain disruptions, damaged goods, and constrained market access [16]. Flood events exacerbate gender inequalities by increasing caregiving responsibilities and limiting decision-making power for women [16]. These gender-specific impacts reflect broader patterns of vulnerability where women's economic activities and social roles make them disproportionately affected by displacement. The literature also highlights that sex is a significant factor influencing relocation decisions, with gender shaping both the experience of displacement and the capacity to adapt [10]. Women's migration patterns are influenced by complex intersections of environmental, economic, and social factors that require gender-sensitive policy responses [3], [16].

4. Socioeconomic Impacts on Affected Populations

4.1 Livelihood Disruption and Economic Losses

Flood-induced displacement creates severe disruptions to livelihoods and generates substantial economic losses across affected communities. The 2012 flooding in the Niger Delta led to impoverishment and decline in food production, contributing to displacement and out-migration [1]. These impacts have far-reaching consequences on human existence and environmental security [1].

In Bayelsa State, flooding severely impacted income, farmland, and food security, with traditional crafts, businesses, and pond fishing highly affected [15]. Local industries including animal husbandry and construction works experienced average impacts, while educational institutions, health services, water supply, commodity prices, local marketing, and transportation faced very high impacts [15]. For women traders in riverine areas, flooding leads to economic disparities through supply chain disruptions, damaged goods, and limited market access [16]. Agricultural livelihoods are particularly vulnerable to flood impacts. In Delta State, flooding is the primary cause of food losses in both freshwater and mangrove swamps, leading to agricultural losses, crop failure, and loss of farmland and inputs [12]. In Akwa Ibom State, 87% of sampled households experienced damaged crops due to flooding [13]. Farmland flooding in Rivers State leads to loss of farmland and produce, loss of livelihood systems and income, and property damage [5]. The economic costs of flooding extend beyond immediate losses to include long-term impoverishment and livelihood displacement [9]. The destruction of lives and properties creates barriers to successful recovery, with government responses often inadequate to reduce the suffering and impoverishment of victims [9].

4.2 Food Security and Agricultural Impacts

Food security emerges as a critical concern in flood-affected areas, with flooding directly threatening agricultural production and food availability. In Bayelsa State, flooding led to very high food insecurity among affected populations [15]. The Niger Delta region experiences climate change-induced agricultural losses and food shortages, with flooding identified as the primary cause of food losses in both freshwater and mangrove ecological zones [12]. Coping strategies for food insecurity during flood events include dietary management, change of occupation, livelihood diversification, out-migration, and reliance on relief materials [12]. Food sources during flood incidents predominantly involve purchasing food rather than producing it, indicating a shift from subsistence to market dependence that increases vulnerability [12]. In Akwa Ibom State, flood damage leads to food insecurity,

necessitating recommendations to introduce alternate means of subsistence [13]. The impact on food security extends beyond immediate shortages to affect long-term agricultural sustainability. The loss of farmland, damage to crops, and disruption of agricultural activities create conditions where communities cannot maintain food production [12], [13], [15]. This agricultural disruption is a key driver of out-migration, as communities seek alternative livelihoods in less flood-prone areas [12].

4.3 Health, Housing, and Infrastructure

Flooding creates multiple health risks for affected populations. The 2012 flood was associated with disease outbreaks, psychological stress, and malnutrition among displaced populations, with overcrowding and poor sanitation exacerbating health risks [4]. In Bayelsa State, climate change influences migration through diseases and health challenges [3]. The spread of infectious diseases is identified as a public health risk associated with flooding in Lagos [8]. Housing impacts are severe, with 24% of sampled households in Akwa Ibom State losing their homes entirely due to flooding [13]. Climate-driven displacement leads to loss of shelter and housing insecurity [2], [3]. In Rivers State, farmland flooding causes property damage and affects residential areas [5]. The destruction of housing creates immediate humanitarian needs and contributes to longer-term displacement patterns. Infrastructure damage is widespread, affecting essential services and community development. In Bayelsa State, flooding has very high impacts on educational institutions, health services, water supply, transportation, and local marketing [15]. In Akwa Ibom State, 52% of households reported impacts on drinking water [13]. Lagos experiences infrastructure damage including agricultural land degradation, water pollution, and erosion [8]. These infrastructure impacts compound the direct effects of flooding by disrupting access to essential services and hindering recovery efforts.

5. Vulnerable Populations and Differential Impacts

5.1 Women and Gender-Specific Vulnerabilities

Women face disproportionate vulnerabilities in the context of flood-induced displacement. The 2020 flood in Nigeria identified women and children as the most vulnerable groups [7]. Climate change significantly shapes women's migration decisions in riverine areas through multiple pathways including disrupted livelihoods, flooding, water scarcity, diseases, health challenges, housing insecurity, increased environmental vulnerabilities, and uncertain future prospects [3].

Women traders in riverine areas experience particular economic vulnerabilities from climate change-induced flooding, including livelihood disruptions, supply chain disruptions, damaged goods, and limited market access [16]. Flood events exacerbate gender inequalities by increasing caregiving responsibilities and limiting decision-making power for women [16]. These gender-specific impacts reflect structural inequalities that make women more vulnerable to displacement and less able to adapt effectively. The literature highlights that women's experiences of displacement differ from men's, with gender shaping both vulnerability and adaptive capacity [3], [16]. Women's economic activities, social roles, and access to resources create specific patterns of vulnerability that require targeted policy responses. The focus on women and children in Anambra State's climate-driven temporary displacement underscores the need for gender-sensitive approaches to understanding and addressing flood-induced displacement [2].

5.2 Children and Youth

Children are identified alongside women as among the most vulnerable groups affected by flooding [7]. Climate-driven temporary displacement in Anambra State specifically highlights impacts on women and children [2]. The vulnerability of children stems from their dependence on adults for protection and resources, their susceptibility to health impacts, and the disruption of education and development opportunities. The 2012 flood's displacement of approximately 2 million people in Anambra State would have included substantial numbers of children, affecting their education, health, and well-being [2]. Flooding's very high impact on educational institutions in Bayelsa State suggests significant disruption to children's schooling [15]. In Lagos, flooding negatively impacts educational status and community development, with particular effects on poor communities where children are concentrated [11]. While the literature provides limited detailed analysis of children's specific experiences of displacement, their identification as a highly vulnerable group underscores the need for child-focused interventions in flood response and adaptation strategies.

5.3 Low-Income and Poor Communities

Poor and low-income communities face heightened vulnerabilities to flood impacts and displacement. In Lagos, flooding aggravates poverty levels and negatively impacts poor communities, with the Makoko urban settlement exemplifying these challenges [11]. Income and access to material resources significantly influence people's experiences and ability to cope with flooding, with state failure in providing services and flood protection shaping differentiated flood risks [18]. Low-income communities in Lagos employ localized adaptation strategies through Community Development Associations, but these endogenous resilience forms cannot replace broader urban governance improvements [14], [18]. The concentration of flood impacts in poor communities reflects spatial inequalities where vulnerable populations are often located in flood-prone areas with inadequate infrastructure and services [8], [11].

Flooding prevents Africa's growing urban population from escaping poverty and impedes achievement of Sustainable Development Goals due to inadequate resources and infrastructure [7]. The economic impacts of flooding—including loss of livelihoods, property damage, and disruption of economic activities—disproportionately affect poor communities who have limited resources for recovery and adaptation [9], [11], [15]. This creates cycles of vulnerability where flooding reinforces poverty and poverty increases vulnerability to flooding.

6. Adaptation Strategies and Coping Mechanisms

6.1 Community-Level Responses

Communities affected by flooding employ various adaptation strategies to cope with recurrent disasters. In Anambra State, the practice of returning to land after floods serves as a local risk management strategy, representing a form of temporary displacement followed by return [2]. This pattern reflects community-level decisions about how to balance livelihood needs with flood risks. In Lagos, low-income communities apply localized strategies through Community Development Associations (CDAs) to prepare for and cope with flooding events [18]. These community-based approaches represent endogenous forms of resilience, though they cannot replace broader urban governance improvements [14], [18]. Citizens use human assets including faith, place attachment, and autochthony for long-term resilience [14]. In Rivers State, farmers in flood-affected areas employ adaptive mitigation strategies to build resilience, though the literature indicates a need for proper education and enlightenment to avoid negative impacts and prepare for flood eventualities [5]. The selection of flood coping strategies is influenced by various drivers, with communities making decisions based on local contexts and available resources [27].

6.2 Migration as an Adaptation Strategy

Migration emerges as a significant adaptation strategy in response to flooding and climate change. In Delta State's mangrove swamps, out-migration accounts for over 65% of respondents' adaptation strategies against climate change-induced food shortage [12]. This high proportion indicates that population movement serves as a primary coping mechanism when local adaptation options are insufficient. However, migration as adaptation is complex and not universally accessible. Some populations face "climate immobility traps" where they are unable to migrate despite facing climate risks [29]. The literature suggests that migration likelihood is influenced by socioeconomic status, natural resource dependence, and demographic characteristics [19]. Migration can be a resilience tool when supported by adapted policies, hosting infrastructure, and protection mechanisms for migrants [19]. The predominantly temporary nature of displacement in many Nigerian contexts suggests that migration is often a short-term coping strategy rather than a permanent adaptation [2]. However, in some cases, particularly where food security is severely compromised, out-migration becomes a more sustained response [12]. Women's migration decisions are shaped by complex factors including disrupted livelihoods, flooding, water scarcity, health challenges, and housing insecurity [3].

6.3 Livelihood Diversification

Livelihood diversification emerges as an important coping strategy for flood-affected populations. In Delta State, coping strategies for climate change-induced food shortage include change of occupation and livelihood diversification alongside out-migration [12]. Women traders in riverine areas adapt through diversified income sources and community solidarity [16]. The shift from agricultural production to purchasing food during flood incidents represents a form of livelihood adaptation, though one that increases market dependence and vulnerability [12]. In Akwa Ibom State, recommendations include introducing alternate means of subsistence to address food insecurity caused by flood damage [13]. This suggests that diversification away from flood-vulnerable livelihoods is necessary for long-term resilience. However, the capacity for livelihood diversification is constrained by socioeconomic factors. Poor communities have limited resources to invest in alternative livelihoods [11], [18]. Women face particular constraints due to gender inequalities that limit their decision-making power and access to resources [16]. The literature indicates that insufficient coping mechanisms characterize many flood-affected communities, highlighting the need for external support to enable effective adaptation [13].

7. Policy Responses and Governance Challenges

The literature reveals significant challenges in policy responses and governance of flood-induced displacement in Nigeria. Government responses to the plight of flood victims face barriers to successful fund utilization in reducing suffering and impoverishment [9]. The assessment of government responses from 2012 to 2018 highlights ongoing challenges in addressing livelihood displacement and poverty among flood victims [9]. This paper adopts patriarchal theory as the theoritical framework.State failure in providing services and overall flood protection shapes flood risk patterns, particularly in urban areas like Lagos [18]. Governance issues and insufficient community engagement hinder effective resilience measures [8]. The need for a national-scale flood management plan is underscored by the complex challenges at the intersection of natural disasters and public health [6].

In Lagos, effective resilience measures are hindered by governance challenges that prevent adequate flood protection and service provision [8], [18]. The differentiated impacts of flooding reflect spatial inequalities in governance and resource allocation, with poor communities facing greater vulnerabilities due to inadequate infrastructure and services [8], [11], [18]. The literature emphasizes the need for proactive and reliable measures to minimize negative effects and promote sustainable development [17]. Regional cooperation is needed to strengthen community resilience and facilitate migration as an adaptation strategy [19]. Policies must be adapted to address differentiated vulnerabilities based on socioeconomic status, dependence on natural resources, and demographic characteristics [19]. Community awareness and engagement practices for proactive flood disaster risk reduction require strengthening [25]. The comparison between Nigeria and other countries highlights opportunities for learning and improving flood resilience through enhanced governance and community engagement [25]. However, the literature indicates that current policy responses remain inadequate to address the scale and complexity of flood-induced displacement in Nigeria.

9. Conclusion

Climate change-induced flooding is a major driver of population displacement in Nigeria, posing serious threats to human security, livelihoods, and sustainable development. A review of 30 studies highlights the patterns, impacts, and consequences of flood-induced displacement across various Nigerian states. The most severely affected regions include the Niger Delta states Bayelsa, Delta, and Rivers alongside Lagos, Anambra, Kogi, and Akwa Ibom. Historic floods, such as the 2012 disaster that displaced over 2.1 million people and the 2020 flood affecting 120,000 persons, illustrate the scale and persistence of this crisis. Displacement is often temporary, with populations returning to flood-prone areas due to livelihood dependence, creating cyclical vulnerabilities. Flooding has severe socioeconomic impacts, affecting livelihoods, food security, health, housing, and infrastructure, with women, children, and low-income communities being disproportionately affected. Communities adopt adaptation strategies such as temporary migration, livelihood diversification, and resilience-building, but their effectiveness is constrained by poverty, governance challenges, and inadequate policies. Government failures in service provision and flood protection, along with barriers to fund utilization, exacerbate vulnerabilities and limit response capacity. Addressing flood-induced displacement requires gender-sensitive policies that integrate climate adaptation, disaster risk reduction, livelihood support, and social protection, alongside stronger governance and national flood management plans. As climate change intensifies, urgent action, continued research, evidence-based policy, and regional cooperation are essential to build resilience and protect Nigeria's most vulnerable populations.

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