Climate-Induced Rural–Urban Migration and Urban Resilience: A Case Study of Makurdi, Nigeria.

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Abstract: Climate-induced migration is increasingly shaping urban landscapes in the Global South, where fragile economies and reliance on natural resources heighten vulnerability to climate variability. This paper investigates rural–urban migration in Makurdi, Benue State, Nigeria, as a case study of how climate stressors—flooding, droughts, land degradation, and insecurity—disrupt rural livelihoods and compel households to seek refuge in urban centers. Using Everett Lee's push–pull theory as a framework, the study demonstrates how environmental pressures and poverty act as push factors, while perceived opportunities in Makurdi serve as pull factors, despite limited infrastructure and governance capacity. Findings reveal that migration has accelerated the growth of informal settlements in flood-prone and marginal lands, intensifying exposure to climate risks such as recurrent flooding, heat stress, and inadequate sanitation. Socio-economic consequences include overcrowding, unemployment, erosion of rural agricultural systems, and heightened insecurity, particularly from farmers–herders clashes. Governance responses, though present—such as the Benue State ACReSAL collaboration, tree planting campaigns, and emergency interventions—remain undermined by weak enforcement, poor infrastructure, and limited institutional capacity. Comparative evidence from Lagos, Accra, and Nairobi underscores that Makurdi's challenges are part of a wider regional trend where unregulated urban expansion and weak governance amplify vulnerability. The study argues that resilience requires integrated, climate-sensitive urban planning that prioritizes nature-based solutions, localized climate policies, and participatory governance models that include migrants and vulnerable groups. In conclusion, climate-induced migration in Makurdi represents both a developmental opportunity and a challenge. If managed inclusively and strategically, migration can contribute to urban resilience and sustainable development. Conversely, neglecting governance reforms will perpetuate cycles of vulnerability and displacement. This research contributes to the broader discourse on climate change, migration, and urban vulnerability in Nigeria and Sub-Saharan Africa, offering insights for policymakers and scholars seeking sustainable solutions in climate-stressed regions.

Keywords: Climate-induced migration, Rural–urban migration, Infrastructure gaps, Urban resilience, Makurdi-Nigeria, Informal settlements

1.0 Introduction

Climate-induced migration has been defined as "the movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border". (IOM, 2019). While this definition offers a broad conceptualization of environmentally induced displacement, there is no clear distinction between "obliged" and "choosing". In many cases, environmental migration occurs under conditions of constrained choices, where individuals may appear to migrate voluntarily but are, in reality, compelled by deteriorating environmental and socio-economic conditions (Odebunmi and Adesida, 2025)

Climate-induced migration is complex, dynamic, and transformative because it results from a combination of various causal factors, including political, social, economic, demographic, household, and individual factors, as well as migrants' characteristics. Osei-Amponsah *et al.* (2023) argued that while migration can be a response to climate risks, not every household affected by climate change is willing to migrate as a coping strategy. Therefore, Castles *et al.* (2015) suggested that the link between climate change and migration is not linear but dynamic and can only be understood as part of a broader social transformational process.

1.1 Climate change as a significant driver of Rural – Urban Migration

Climate change has emerged as a significant driver of environmental and socio-economic transformation, with notable implications for human mobility in vulnerable regions. Increasing temperature variability, irregular rainfall patterns, droughts, and flooding have disrupted agricultural systems and rural livelihoods, thereby intensifying migration as an adaptive response (Halliru *et al.,* 2024).

In Sub-Saharan Africa, especially in Nigeria, Benue State, and Makurdi in particular, migration is a key driver of urban growth and land degradation (Sakketa, 2023). Climate change, population increase, and socioeconomic conditions propel internal migration (Teye and Nikoi, 2022). Over 70% of Nigerians live below the national poverty line, and migration is often adopted to escape poverty and conflict, further intensifying urban expansion and land degradation (Aweda *et al.,* 2024). This leads to the search for better economic opportunities and higher standards of living (Schürmann *et al.,* 2022). Internal migration within Nigeria often occurs across settlements, wards, local government areas (LGAs), and states through rural–urban, rural–rural, and urban–rural movements. This impacts the environment and livelihoods of the country by causing drought, erosion, food insecurity, and unemployment (Adenle *et al.,* 2020).

Benue State's capital, Makurdi, offers a key case study to understand the dynamics of climate-induced migration and urban resilience. Being a riverside city on the River Benue, Makurdi is vulnerable to hydrological hazards, compounded by unplanned urbanization. This evaluation examines the impacts of climate-induced rural-urban migration on urban resilience, particularly with regard to how informal settlements contribute to vulnerability to flooding, heat stress, and infrastructure gaps, and their associated socio-economic implications as primary case studies. It also assesses the role of current urban governance approaches in addressing or worsening these issues.

1.1.1 Description of Makurdi as a case study Area

Makurdi town, the Capital city of Benue state in north central Nigeria. It is the headquarters of Makurdi local government area and the capital of Benue state. The city is located between longitude 8 ° 24'E and 8 ° 38'E of the Greenwich Meridian and latitude 7 ° 38 'N -7 ° 50 ' N, of the equator (Figure.1). It is situated in the Benue valley in the middle belt region of Nigeria. It is traversed by the second-largest river in the country, the Benue River. The river Benue has been joined by a tributary called the river Katsina–Ala, whose pathway is through Makurdi before joining the river Niger at the confluence in Lokoja, Kogi State (Targba, 2026).

The town is divided into two major blocks by river Benue hence the North and South banks (Ocheri, 2012), (figure. 1). It has a population of 239,889 comprising 125,513 males and 114.376 females (1991 census) and 154,138 males and 146,239 females totaling 300,377 (FGN, 2007) according to 2006 census and an estimated at 508,595 in 2026, which represents a 3.83% annual change. These population estimates and projections come from the latest revision of the UN World Urbanization Prospects (2026). These estimates represent the Urban agglomeration of Makurdi, which typically includes Makurdi's population in addition to adjacent suburban areas with a land mass of 16km radius. Its location can best be described as the "Gateway" of the state to both the north and south; the Makurdi rail bridge provides the only link between the north and eastern part of the country. (Mage *et al.,* 2025).

The city, which started as a small river port in the 1920s, without a planning ordinance, later became a colonial provincial headquarters in 1927. Makurdi is currently subdivided into eleven political divisions, known as council wards, namely: Agan, Bar, Fiidi, Central South Mission, Clerk/Market, Mbalagh, Modern Market, North Bank 1, North Bank 2, Wadata/Ankpa, and Wailomay (Mage *et al.,* 2025; Targba, 2026).

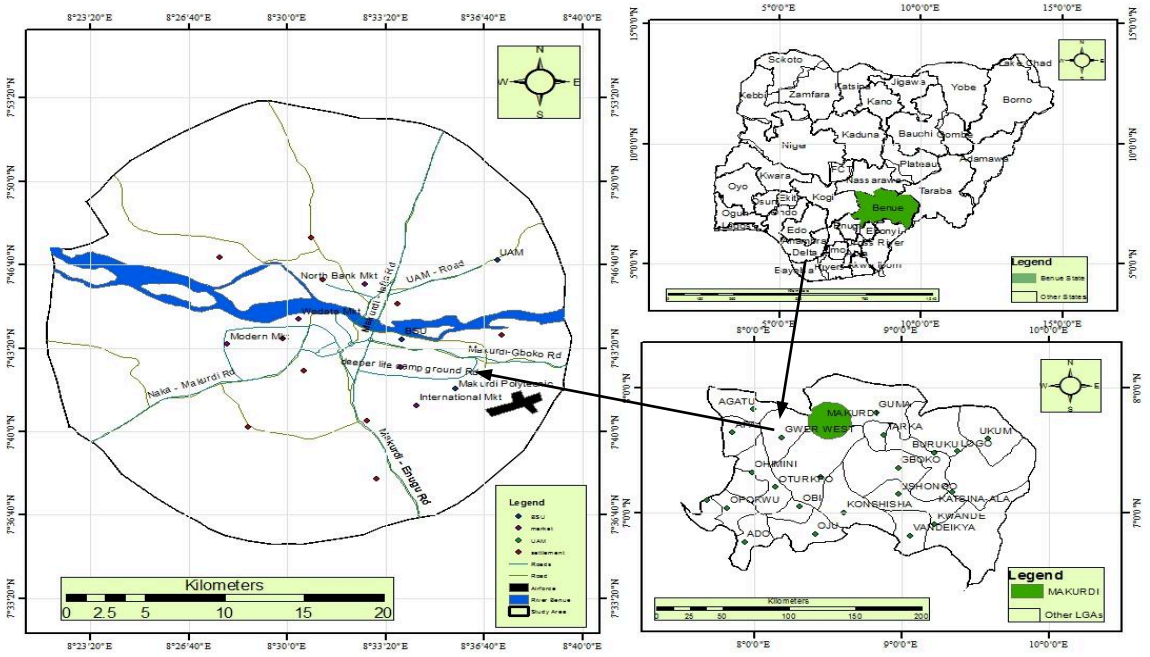


Figure 1: The Study Area (Makurdi Town, Benue State, Nigeria)
Source: Authors Field Work, 2026

1.1.2 Climate of Makurdi Study Area

The climate of Makurdi town is the tropical wet-dry type, Koppen's Aw classification, with double maxima (Targba, 2026). The city falls within the Aw climate type, characterized by distinct wet and dry seasons (Shabu *et al.,* 2025). The rainy season lasts for seven months (from April to October). It starts in April, when there is a northward movement of the intertropical discontinuity (ITD), and ends in October, when the ITD moves to the southern part of Nigeria. With its peak between July and August, the annual rainfall totals for the area range from 1200mm to 1500mm (Shabu *et al.,* 2025), and five months of dry season (November- March). The dry season comes with low relative humidity, with its dry peak between December and January. The temperature of the area is typical of the entire middle belt region of Nigeria; it is at its lowest during the peak months of harmattan (January and December).

1.2 Climate Change and Human Mobility in The Global South

The problem of climate-induced migration is gaining momentum as one of the cardinal issues of the Global South, whose poor adaptation abilities and reliance on natural resources make societies particularly susceptible to climate change (Black *et al.,* 2011). In this regard, migration is connected not only with abrupt climatic phenomena like floods, droughts but also with gradual processes, such as land degradation, desertification, and ecosystem collapse and insecurity (Rigaud *et al.,* 2021). Although Tacoli (2009) suggests that environmental migration is an adaptation to disturbances, some scholars warn that it may lead to the destabilization of the already fragile political zones, in the case of a movement of people (Reuveny, 2007). Sahel is one of the most climate-vulnerable regions in sub-Saharan Africa, and the average temperature is increasing 1.5 more than the global average (IPCC, 2021). Turning rainfall patterns and diminishing soil quality have led to augmented rural-agricultural slush, in addition to the north-south outlined in empirical research on migration among pastoralists or the agrarian people (Barnett *et al.,* 2023). Nevertheless, little research is available to associate these movements with the general discussion of human security and state fragility in West African countries such as Nigeria.

1.3 Comparative Perspectives on Climate-Induced Migration and Urban Resilience

While Makurdi provides a compelling case study of climate-induced rural–urban migration, similar dynamics are evident across other cities in Sub-Saharan Africa. For instance, Lagos, Nigeria's largest urban center, has experienced rapid informal settlement growth along flood-prone coastlines, driven by rural migrants escaping agricultural decline in the hinterlands (Kasim et al., 2022). Comparable patterns are observed in Accra, Ghana, where unregulated urban expansion has heightened vulnerability to flooding and heat stress (Amoako & Boamah, 2017). These cases highlight that climate-induced migration is not an isolated phenomenon but part of a broader regional trend where weak governance and inadequate infrastructure amplify risks. The comparative evidence suggests that Makurdi's challenges are emblematic of a wider governance gap in African cities. Urban resilience requires not only technical interventions such as drainage desilting or flood control projects but also institutional reforms that strengthen the enforcement of land-use regulations and integrate migrants into planning frameworks. Without such reforms, climate-induced migration will continue to exacerbate socio-economic fragility and environmental degradation across the region.

1.4 Integrating Climate-Sensitive Urban Planning

A critical improvement for Makurdi lies in adopting climate-sensitive urban planning approaches. Scholars argue that resilience is best achieved through "nature-based solutions" such as wetland conservation, reforestation, and green infrastructure, which simultaneously mitigate flood risks and enhance urban livability (Kabisch *et al.,* 2017). In Makurdi, however, wetlands have been converted into built-up areas, undermining natural flood buffers. Integrating green belts, enforcing zoning laws, and promoting vertical housing development could reduce pressure on marginal lands while accommodating population growth.

Moreover, participatory governance models that involve migrants, local communities, and civil society organizations in decision-making are essential. Evidence from Nairobi's informal settlements shows that community-driven upgrading projects, when supported by municipal authorities, can significantly improve resilience to climate risks (Satterthwaite *et al.,* 2020). Applying similar participatory frameworks in Makurdi would ensure that policies are inclusive and responsive to the needs of vulnerable populations.

1.5 The Migration theory (Push and pull theory)

This theory was presented by Everett Spurgeon Lee in 1966. According to the theory, migration is generally described as a change in residence on either a permanent or semi-permanent basis. According to the theory, every act of migration requires an origin, a destination, and obstacles that can intervene, irrespective of the distance and difficulty faced in such movement. According to him, the reasons why people migrate are functions of push and pull factors. These are the two forces that either attract people to move to a new location or compel them to leave their old residences. It could be environmental, cultural, economic, or political.

Push factors are conditions that can compel people to leave their places of residence. Examples of push factors, especially in rural areas and among farmers, are unfavourable weather conditions, poor soil productivity, deforestation, climate change, insecurity, disasters, hunger, land/soil degradation, demographic pressure, among others. On the other side, pull factors are the factors that draw people to a certain location. They are the exact opposite of push factors. Better educational possibilities, better weather, better career prospects, better farming activities, and other things are examples of pull forces among farmers and in rural areas. Although this hypothesis inspired research on the different elements affecting migration, it neglected to take into account the traits of migrants, their assimilation at their destinations, or their motivations for migrating.

This compels rural people to migrate to urban centers such as Makurdi. Migration to Makurdi is largely characterized by low-income households seeking livelihood diversification, settlement in peri – urban and informal areas, or marginal lands.

1.2.3 Implication for urban resilience

Rural–urban migration has placed immense pressure on urban centers such as Makurdi, leading to challenges such as overcrowding, rising unemployment, housing shortages, and environmental degradation. The influx of rural migrants has intensified competition for limited jobs and social services, thereby creating new socio-economic problems. This dual impact, declining rural productivity and strained urban capacity reflects the complexity of migration as both a developmental opportunity and a challenge that requires balanced policy attention (Abaji *et al.,* 2025).

Empirical studies in Nigeria and other developing countries have shown that the effects of rural– urban migration extend beyond economic concerns to include social and cultural transformations. The migration of young people often leads to the erosion of traditional family structures, changes in rural community life, and declining interest in agricultural occupations. For Benue State, where the economy and social fabric are deeply rooted in agriculture, the long-term consequences of these changes could hinder rural development and threaten food sustainability (Ge *et al,* 2020; Niyonzima, 2023)

The following are the implications summarized below

a. **Loss of Green Infrastructure:** Rural-urban migration leads to a faster depletion of the environment through deforestation, and conversion of wetlands to develop areas, which serves nature base solution to flood, is destroyed, giving way to impervious surface that encourages flooding, loss of ecosystems, which undermines the city's environmental resilience to disasters.
b. **Flooding Vulnerability:** Migrant inflows, often for security reasons, result in the creation of informal settlements in flood-prone areas such as Wurukum, Wadata rice mill, the north bank around the old and new bridge, and the floodplains of the Benue River. This contributes to the flood risk and natural disaster vulnerability of the city.
c. **Urban Overcrowding and Stretched Infrastructure:** The rapid increase in urban population is a result of rural-urban migration, which is a significant cause that puts pressure on the limited resources and urban services, including waste, water supply, and sanitation, in the outskirts of the city.
d. **Socio-economic Strain:** The influx can outpace employment growth, leading to a large underemployed informal sector, which can lead to crime and lower economic resilience. This is noticeable in Wurukum, Asase, Dayspring area, Wadata, Akphene, and other neighbourhoods in Makurdi. Most migrants who do not engage in economic activities join bad friends, and they are influenced negatively. Some join cultism, armed robbery, and prostitution for the ladies
e. **Disproportionate Vulnerability:** Climate-induced migration perpetuates a cycle of displacement and poverty as migrants, who often have lesser access to resources and social networks, are disproportionately vulnerable to the same climate risks they have left.
f. **Limited Adaptability:** The stress of rapid development reduces the city's ability to plan and implement land use and zoning regulations, decreasing resilience and long-term planning, as is the case in Makurdi.

1.6 How the expansion of informal settlements shapes vulnerability to climate risks such as flooding, heat stress, and inadequate infrastructure.

Climate change is significantly impacting regions worldwide, and Makurdi in Nigeria is no exception. Located in the middle belt of the country, Makurdi is grappling with the adverse effects of climate change and urbanization, leading to profound implications for its environment, economy, and the well-being of its inhabitants. The state experiences a predominantly tropical climate, characterized by distinct wet and dry seasons. Over the years, however, climate change has manifested in the alteration of these patterns, resulting in increased temperatures, irregular rainfall, and extreme weather events. Studies such as Akinsanola *et al.* (2017) have documented a rising trend in temperature and changes in precipitation patterns in Nigeria, contributing to the overall climate variability in Benue State. One of the most pressing climate-related challenges in Benue State and Makurdi in particular is the increased frequency and intensity of floods. The location's topography, with its network of rivers and streams,

makes it susceptible to flooding during the rainy season. Most of which are informal settlements, and others have converted wetlands into built-up areas

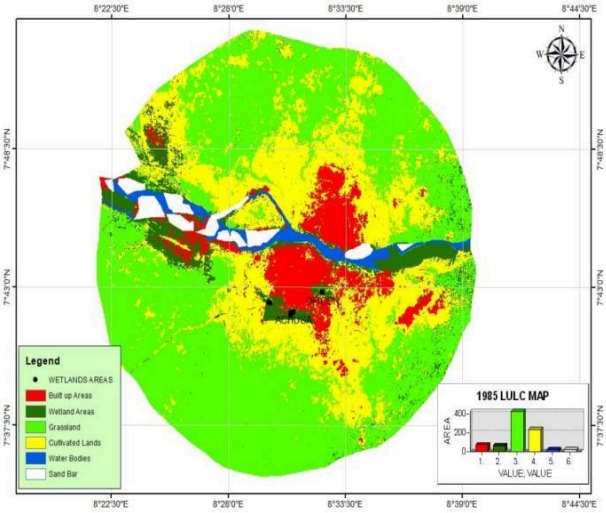
Wurukum

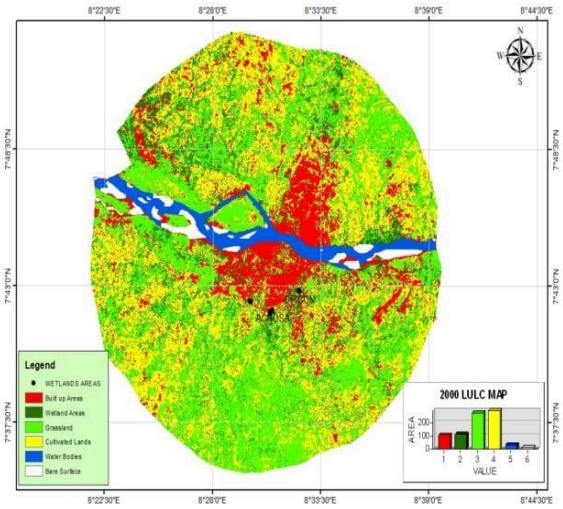
Achusa

During a field visit in the Wadata Area of Makurdi, some flood-affected communities in Makurdi metropolises
Source: Authors Field Work, 2026

Unplanned urban expansion, such as the building of structures on floodplains and drainage channels, and the upsurge of slums and ghettos, such as Wadata Rice Mill and North Bank areas of Makurdi city, make such households vulnerable to flood impacts

In Makurdi, flooding has become a recurrent phenomenon, as every rainy season, most people in the area are affected. The overflow of water bodies, exacerbated by heavy rainfall, rapid urbanization, the release of water from the Lagdo dam in Cameroon, and changes in precipitation patterns, poses a significant threat to communities along riverbanks and low-lying areas (Oloruntade *et al.,* 2019). Flood events, especially, have resulted in the destruction of homes, agricultural land, and infrastructure, forcing many residents to seek refuge in displacement camps. Climate change-induced shifts in rainfall patterns have also contributed to drought conditions in the state. Prolonged periods of drought, coupled with increased evaporation, have led to the drying up of water sources and reduced agricultural productivity.





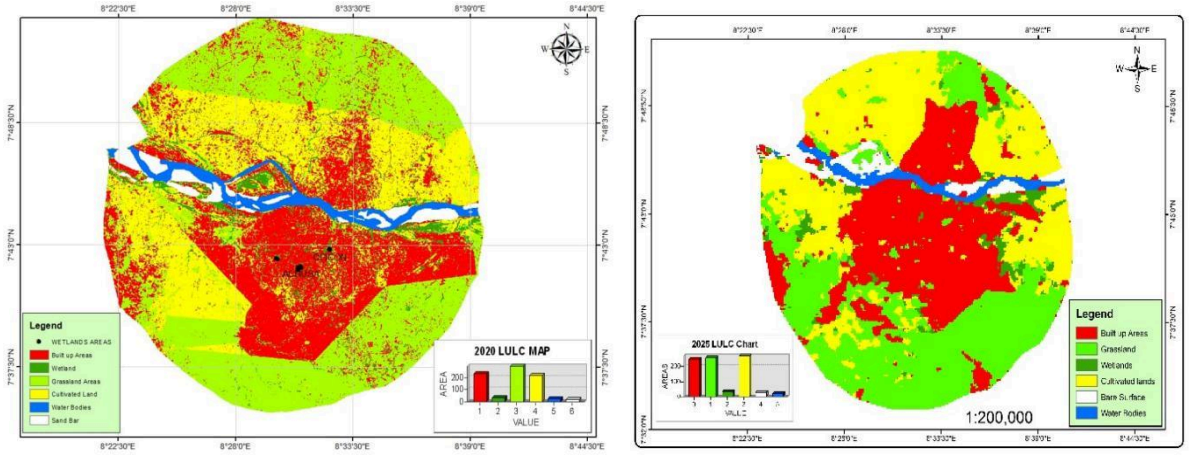


Figure 2: Land use and land cover map of Makurdi between 1985 and 2025
Source: Authors Field Work, 2026

An analysis of land use and land cover changes has revealed the growth and expansion of settlements, most of which are inhabited by informal or low-income people who are vulnerable to flooding in the rainy season. Settlements in Makurdi city, mostly affected, include Wurukum, Wadata Rice Mill, Idye, North Bank, Lower Benue, and Gyado Villa, Achusa, around the Police mobile barracks along Naka Road, where severe flood disasters have always been recorded between 2012 and 2024. Figure 2 shows the rate of urbanization and expansion of settlements along the river Benue, which makes them more prone to flooding. This is in line with the study by Acha et al. (2020), which finds that rainfall was not the only cause of flooding in Makurdi, but rather poor adherence to land-use zoning and planning. Figure 3 shows the risk of Makurdi. It was found out that the elevation of Makurdi ranges between 59m and 201m, making it prone to flood occurrence. Only 10.91% of the land area is completely safe from flood due to its high elevation (table 1), the rest of the fall between very high to low risk areas, although floods can still occur if waterways are blocked and wetland areas are converted into built-up areas, as is the case with the present University of Agriculture remedial study Centre, Oficon Nigeria limited, and Katsina–Ala Street extension. All this development is attributed to the continuous influx of people migrating from rural areas to Makurdi for better opportunities.

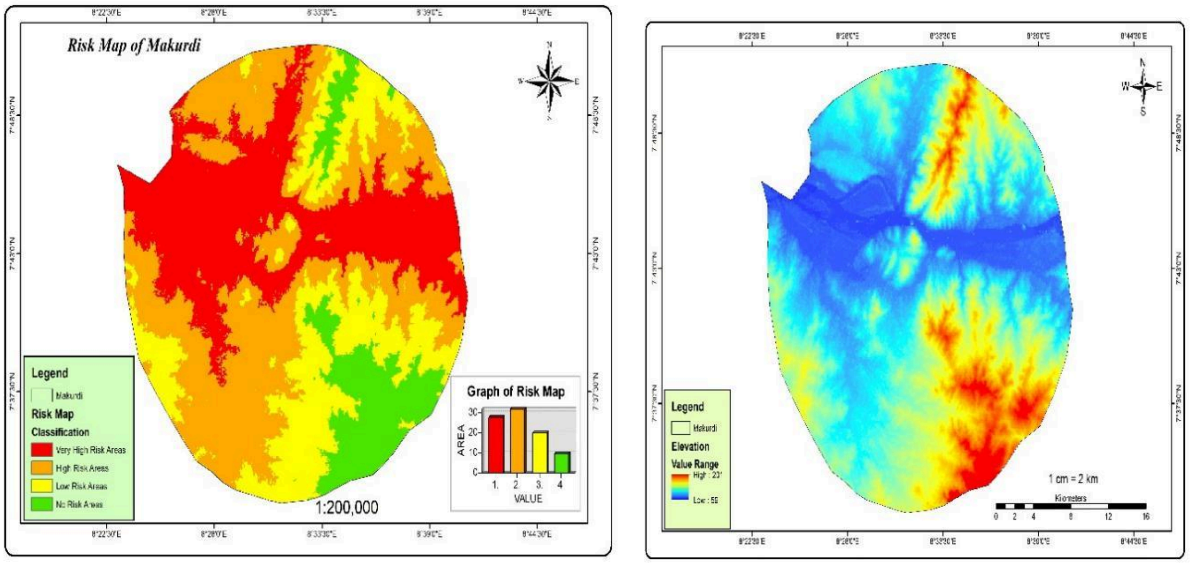


Figure 3: Risk and Elevation Map of Makurdi
Source: Authors Field Work, 2026

Table 1: Vulnerability Level of Makurdi to Flooding

AREA (km)	Percentage (%)	Classification Level
27.34	30.86	Very high-risk areas
31.85	35.93	High-risk areas
19.76	22.30	Low-risk areas
9.67	10.91	No risk areas

Additionally, urbanization and development pressures often lead to decisions that prioritize economic growth over resilience, where strategic land-use planning and regulatory measures are lacking (Ilugbusia *et al.,* 2024). The growing demand for housing and agricultural land, particularly in cities, has been linked to the development of marginal lands such as floodplains (Kasim *et al.,* 2022). Hence, the government should prioritize deliberate urban planning strategies to check population pressure and deliberate construction of buildings on flood plains and water channels to reduce the devastating impacts of floods in Makurdi city

With regards to heat stress, compact and poorly ventilated buildings are exposed to heat stress, which results in illnesses such as meningitis because of increasing temperature and lack of green space, exacerbating thermal comfort. In terms of infrastructural deficiencies, limited access to water and sanitation raises the risk of disease, and Inadequate waste management poses risks. Human activities also contribute to the impact of climate change on floods through the destruction of drainage channels, building on flood planning, and urbanization, which contribute to worsening the flood disaster in Makurdi city.

The intricate link between climate change and displacement (migration) is evident in Nigeria's experiences as it is the case in Benue state, where clashes between herders and farmers has resulted to force migration to Makurdi, the state capital, one of the current clashes is the one that occurs 2024 in Yelwata, Guma LGA of Benue State. Where over 200 people were killed according to report. Displacement or migration can result from sudden-onset events such as insecurity, floods and storms, or gradual environmental changes such as desertification.

According to the Internal Displacement Monitoring Centre (IDMC, 2020) notes that climate change contributes significantly to displacement globally, with vulnerable populations often forced to leave their homes due to environmental stressors. Research on climate-induced displacement in Nigeria highlights the urgent need for comprehensive assessments.

1.3.1 Climate Change as a Driver, not a Source of War: (**farmers-herders clashes in Benue State)**

Climate change may not really be the cause of farmers and herders' continuous clashes, but a major driver. Benue State is one of the worst hit by these clashes, which have continued to result in migration for agricultural communities to Makurdi, the state capital, which is safer and more secure due to the presence of security. By putting more pressure on the already inadequate infrastructure in Makurdi. The study of (Hashim and Ogundare, 2025) proves that climate-caused migration does not automatically result in conflicts per se but heightens preexisting social, economic, and political conflicts. As expected, according to Ide (2021) and Benjaminsen and Ba (2021), their research explains that the presence of climate variability as a stressor interacts with the presence of unresolved land tenure conflict, poor conflict resolution machinery, and a history of grievance.

To illustrate, rivalry over the farmlands and rivers between the pastoralists and the farmers in several LGAs of Benue State, especially in Agatu, Guma, Gwer West, Buruku, Katsina-Ala LGA, and others, was reported to have been a major cause of violence, not necessarily given the lack of availability of environmental resources, but wants to take the land by force, insisting that the land belongs to all of Nigeria. This crisis forces people to migrate to Makurdi. The pictures below show the IDP camp in Makurdi and the casket of the body of their loved ones protesting the killing, which led to the blocking of the Lafia – Makurdi expressway in June 2025. In the same figure 4 shows a geospatial map indicating clashes in Benue State, where Guma and Agatu experience more of it

IDP Camp in Makurdi

2025 Protest in Yelwata over herds men attack

Source: https://gazettengr.com/yelwata-killings-300-idps-get-medical-treatment-daily-says-unicef/

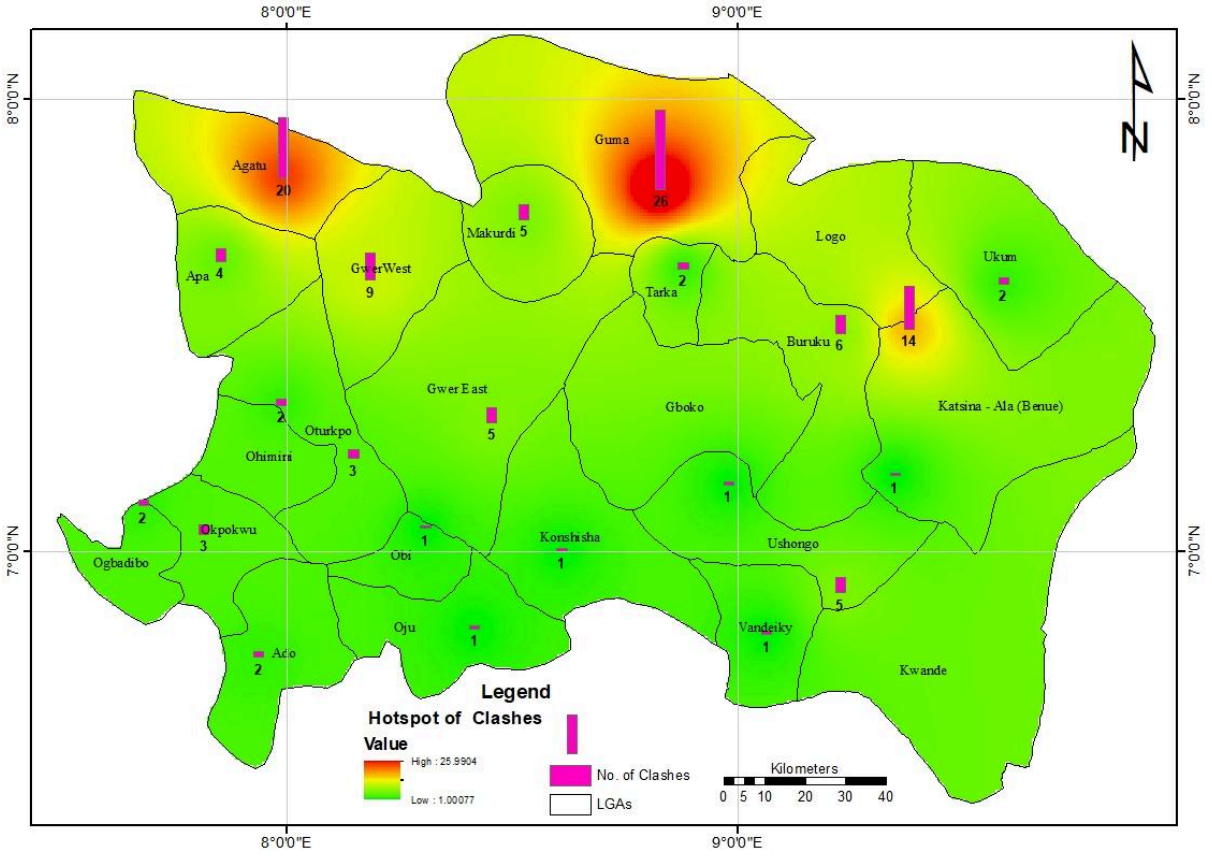


Figure 4 shows the farmers' herder clashes hotspot based on the report
Source: Authors Field Work, 2026

1.4 To what extent do current urban governance strategies address or exacerbate these challenges?

1.4.1 Policies

Poor government policies, such as conflicting land uses in the face of rapidly growing populations, inadequate management of natural resources, as well as several strategic plans and frameworks developed to mitigate and respond to incessant flooding, heat stress, and insecurity, have not positively impacted the people. These policies include the Federal Government's National Strategic Plan of Action for Flood Prevention and Management, aimed at reducing the impact of flood disasters in Nigeria, and the National Contingency Plan with the goal of reducing the effects of disasters and protecting lives during high-priority risks (UNICEF, 2023). The anti-opening grazing law was signed into law by Governor Samuel Ortom's administration, forest guards across the 23 LGAs. Other government strategies that aim to address or exacerbate these challenges are discussed below.

1.4.2 Urban Governance Strategies Addressing the Challenges

Recent initiatives show a shift towards proactive climate management: these include

1. **Benue State ACReSAL Collaboration:** The Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL). The Benue State Urban Development Board is collaborating with ACReSAL to improve climate-sensitive land use planning, including desilting major drainages in Makurdi.
2. Benue State Government intervention through the State Emergency Management Agency (SEMA), with support from the Federal Emergency Management Agency (FEMA) and other response and regulatory agencies, such as the Benue State Urban Development Board, has made efforts to support IDPs in Makurdi through the provision of some basic amenities
3. **Structural Planning:** Efforts are underway to integrate green infrastructure, urban furniture, and erosion control works into the state's planning framework.
4. **Policy Formulation:** The state government is actively formulating a climate change policy to guide emergency response, mitigation, and adaptation efforts.
5. **Tree Planting**: Campaigns to address deforestation, a key contributor to local climate change, are being implemented.
6. The federal government had allocated some flood control projects to Benue State that would have mitigated the impact of flooding, but the projects have failed to address the main issues despite millions spent.
7. The 2021 Budget shows that the state government paid N18, 765,149 to contractors for different projects aimed at mitigating flood disasters and voted N1, 289,905,600 for similar projects in 2022 (Egwu, 2024)

1.4.3 Governance Gaps Exacerbating the Challenges

Despite these steps taken so far, gaps in governance often heighten risk:

a. **Weak Enforcement and Planning:** Unplanned urban growth and poor enforcement of development regulations, particularly along riverbanks and building codes, worsen flood risks for residents and migrants.
b. **Inadequate Infrastructure:** Rapid population growth in Makurdi is putting immense strain on existing waste management and sanitation systems, leading to pollution and flooding, which most residents identify as a major concern.
c. In Makurdi, the government, during the administration of Muhammadu Buhari, awarded a contract project at N700 million. But the flood continued whenever the rains were heavy in Makurdi (Egwu, 2024)
d. **Lack of Capacity:** Environmental ministries and local agencies often lack the technical and financial capacity to manage the scale of climate-related migration and infrastructural demands.
e. **Vulnerability of IDPs:** Internally displaced persons (IDPs) face heightened risks of poor health, insecurity, and social exclusion, with inadequate tailored support to aid their transition, especially for female-headed households.

f. Nigeria has urban and climate policies, such as the National Urban Development Policy and Climate Change Act (2021), but these policies are not well localized

1.7**Policy Recommendations**

To strengthen urban resilience in Makurdi and similar cities, the following policy directions are recommended:

a. **Localized Climate Policies:** Adapt national frameworks such as the Climate Change Act (2021) to reflect local realities, ensuring that interventions are context-specific.
b. **Investment in Infrastructure:** Prioritize sustainable drainage systems, waste management, and water supply to reduce vulnerability to floods and disease outbreaks.
c. **Nature-Based Solutions:** Protect wetlands and riverbanks as ecological buffers against flooding.
d. **Community Participation:** Empower migrant communities through participatory planning, livelihood diversification programs, and access to social services.
e. **Regional Collaboration:** Share best practices across West African cities facing similar challenges, leveraging platforms such as ECOWAS for coordinated climate adaptation strategies.

1.8 Conclusion

Rural–urban migration in response to climate change has a profound impact on urban resilience in Makurdi. Migration is a logical adaptive strategy for households facing environmental stressors, yet its intersection with inadequate governance systems renders the city increasingly vulnerable. The expansion of informal settlements in flood-prone and marginal areas intensifies exposure to flooding, heat extremes, and infrastructural deficiencies. Socio-economic strains such as unemployment, overcrowding, and insecurity further complicate the resilience of Makurdi's urban environment.

However, Makurdi's experience is not unique. Comparative evidence from Lagos, Accra, and Nairobi demonstrates that climate-induced migration is a regional phenomenon across Sub-Saharan Africa, where weak governance and unregulated urban expansion amplify risks (Kasim et al., 2022; Amoako & Boamah, 2017; Satterthwaite et al., 2020). This broader perspective underscores the need for integrated, climate-sensitive urban planning that prioritizes resilience over short-term economic growth.

To strengthen resilience, Makurdi must adopt deliberate strategies that combine **nature-based solutions** such as wetland conservation and reforestation (Kabisch et al., 2017), with **localized climate policies** that adapt national frameworks to local realities. Equally important is **community participation**, ensuring that migrants and vulnerable groups are included in planning and decision-making. Investment in sustainable infrastructure, enforcement of zoning regulations, and regional collaboration through platforms such as ECOWAS can provide long-term solutions.

In conclusion, climate-induced migration in Makurdi represents both a challenge and an opportunity. If managed inclusively and strategically, migration can contribute to urban development and resilience. Conversely, neglecting governance reforms will perpetuate cycles of vulnerability and displacement. The path forward requires a holistic, participatory, and climate-sensitive governance model that integrates migrants into the urban fabric while safeguarding ecological systems. This approach will not only enhance resilience in Makurdi but also provide lessons for other climate-stressed cities in the Global South.

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