

CLIMATE CHANGE: PUSH FACTOR FOR EMPLOYEE MOBILITY AMONG ACADEMIC STAFF OF FEDERAL UNIVERSITIES IN NORTH- EAST, NIGERIA

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Abstract

One of the critical but less explored dimensions of climate change is its influence on human mobility. This study examines how climate change can be push factor for employee mobility among academic staff of federal universities in North-East, Nigeria. The specific objectives are to: (i) examine the extent to which extreme weather condition has affected Employee Mobility of academic staff in Federal Universities in North East, Nigeria. (ii) assess the level of rainfall among academic staff in Federal Universities mobility in the region; (iii) determine the influence of Flood risk on the Employee mobility decisions of academic staff.

The research was of cross sectional survey type. Data collection from the respondents was done with the help of a structured questionnaire. Six (6) Federal Universities were used from North East, Nigeria. The MSMEs operators were sampled using Taro Yemanisample size determination formula with a sample size of 371seasoned Lecturers. Simple random sampling technique was used for the study. The data gathered was analyzed descriptively and by multiple regression at 0.05% significant level. The findings of the study were that: Extreme weather event has significant effect on the employee mobility: $\beta = 0.438$, $t = 5.544$, $p = 0.000$. Level of rainfall has a significant effect on

employee mobility: $\beta = 0.316$, $t = 4.389$, $p = 0.000$. Level of flood risks has a significant effect on the employee mobility: $\beta = 0.287$, $t = 3.543$, $p = 0.000$. The study concluded that increasing occurrence of extreme weather conditions, changes in rainfall patterns, and heightened flood risks have become critical environmental factors affecting the movement, work participation, and relocation decisions of academic staff in the North Eastern, Nigeria. Accordingly, the study recommended that the University management and relevant government agencies should invest in climate-resilient infrastructure such as improved road networks, drainage systems, flood-control facilities, and accessible transportation routes.

Keywords: Climate change, Employee Mobility, Extreme Weather Condition, Level of Rainfall, Flood Weather event, rising sea level, North-East, Nigeria.

1. Introduction

Climate change has emerged as one of the most pressing global challenges of the 21st century, with far-reaching environmental, social, and economic consequences. It refers to long-term alterations in temperature, precipitation patterns, and other climatic conditions, largely driven by anthropogenic activities such as greenhouse gas emissions, deforestation, and industrialization. In recent decades, the intensity and frequency of extreme weather events including floods, droughts, and heat waves have increased significantly, particularly in developing countries like Nigeria (Oloyede, 2025). These changes not only affect natural ecosystems but also disrupt human systems, including livelihoods, health, and institutional functioning.

Nigeria is highly vulnerable to the impacts of climate change due to its geographical location, dependence on climate-sensitive sectors, and limited adaptive capacity. Evidence indicates that climate variability in Nigeria has resulted in rising temperatures, irregular rainfall patterns, flooding, desertification, and environmental degradation (Ologunorisa et al., 2019; Omotade et al., 2021). These environmental stressors have contributed to food insecurity, public health challenges, and socio-economic instability across various regions of the country. In particular, northern Nigeria including the North East region has experienced severe climate-related challenges such as drought, desert encroachment, and flooding, which have compounded existing issues of insecurity and displacement.

Within the context of higher education, academic staff represents a critical human resource that drives teaching, research, and institutional development. However, environmental stressors associated with climate change can significantly affect their productivity, well-being, and mobility decisions. Adverse climatic conditions such as extreme heat, poor infrastructure due to flooding, and insecurity linked to environmental degradation may push academic staff to relocate, seek employment in more stable environments, or migrate to other regions or countries. This phenomenon aligns with the broader concept of push-pull migration theory, where unfavorable environmental conditions act as push factors influencing movement.

In the North East region of Nigeria, where several federal universities are located, the combined effects of climate change, insecurity, and socio-economic challenges have heightened the mobility

tendencies of academic staff. Climate-induced disruptions such as damage to infrastructure, reduced quality of life, and increased health risks can weaken institutional stability and contribute to staff turnover. Furthermore, the interaction between climate change and other structural challenges may exacerbate “brain drain” within the academic sector, thereby affecting the quality of education and research output in the region.

Despite growing global attention to climate change and migration, there is a noticeable gap in empirical research focusing specifically on climate change and employee mobility within the academic sector in Nigeria. Most existing studies have concentrated on rural communities, agriculture, and general population displacement, with limited attention given to professional groups such as university staff. Understanding how climate change influences the mobility of academic staff is essential for developing effective institutional and policy responses aimed at retaining skilled personnel and ensuring the sustainability of higher education institutions.

Therefore, this study seeks to examine the relationship between climate change and employee mobility among academic staff of federal universities in North East Nigeria. It aims to provide insights into how environmental changes shape workforce dynamics in the academic sector and to contribute to the growing body of knowledge on climate change and human mobility.

1.2 Statement of the Problem

Climate change has increasingly become a critical driver of environmental and socio-economic disruptions across the globe, with developing countries like Nigeria bearing a disproportionate burden. In recent years, the North East region of Nigeria has experienced intensified climate-related challenges such as rising temperatures, prolonged droughts, irregular rainfall patterns, flooding, and desert encroachment (Intergovernmental Panel on Climate Change, 2023; International Organization for Migration, 2024). These environmental stressors have not only affected agricultural productivity and rural livelihoods but have also contributed to broader socio-economic instability, displacement, and insecurity within the region.

While considerable attention has been given to the impact of climate change on vulnerable rural populations and agricultural systems, relatively little empirical focus has been directed toward its implications for professional sectors, particularly the academic workforce in higher education institutions. Federal universities in North East Nigeria operate within environments that are increasingly characterized by climatic uncertainty and infrastructural vulnerability. Issues such as extreme heat conditions, flood-damaged facilities, erratic power supply exacerbated by weather conditions, and health risks associated with environmental degradation may negatively influence the working conditions and overall well-being of academic staff.

Employee mobility, especially among highly skilled professionals like university lecturers, is influenced by a combination of economic, social, institutional, and environmental factors. In the context of climate change, adverse environmental conditions can act as “push factors,” compelling academic staff to seek more stable and conducive working environments either within other regions of Nigeria or outside the country. This situation potentially contributes to increased staff turnover, brain drain, reduced research productivity, and weakened institutional capacity in affected universities.

Despite these observable challenges, there is a lack of systematic and context-specific research that clearly establishes the relationship between climate change and employee mobility among academic staff in federal universities located in North East Nigeria. Existing studies have largely focused on general migration patterns, internally displaced persons, and rural adaptation strategies, with minimal attention given to how climate variability influences workforce stability in the education sector. Consequently, policy responses and institutional strategies aimed at staff retention often overlook environmental factors as a significant determinant of employee mobility.

The problem, therefore, lies in the insufficient understanding of how climate change-induced environmental conditions influence the mobility decisions of academic staff in federal universities within North East Nigeria. Without adequate empirical evidence, university administrators and policymakers may be unable to design effective interventions to mitigate staff turnover and ensure institutional sustainability. This study seeks to fill this gap by examining the extent to which climate change contributes to employee mobility among academic staff and by providing insights that can inform policy and strategic planning in the higher education sector.

1.3 Research Questions

The following research questions are formulated to guide the study:

1. To what extent has extreme weather condition affected the employee mobility of academic Staff in Federal Universities in North East Nigeria?
2. What is the level of rainfall among academic staff in federal universities mobility in the region?
3. How does flood risk influence the mobility decisions of academic staff in North East Nigeria?

1.4 Objectives of the Study

The main objective of this study is to examine the relationship between climate change and employee mobility among academic staff of federal universities in North East Nigeria.

The specific objectives are to:

1. Examine the extent to which extreme weather condition has affected Employee Mobility of academic staff in federal universities in North East Nigeria.
2. Assess the level of rainfall among academic staff in Federal Universities mobility in the region.
3. Determine the influence of Flood risk on the Employee mobility decisions of academic staff.

1.5 Research Hypotheses

The following hypotheses are formulated to guide the study:

H₀₁: Extreme weather condition has no significant effect on the working conditions of academic staff in federal universities in North East Nigeria..

H₀₂: There is no significant relationship between Rainfall and employee mobility among academic staff in federal universities in North East Nigeria.

H₀₃: Flood risks do not significantly influence employee mobility among academic staff.

1.6 Scope of the Study

This study focuses on examining the relationship between climate change and employee mobility among academic staff of federal universities in North East Nigeria. Geographically, the study is limited to selected federal universities located within the North East geopolitical zone of Nigeria, which includes states such as Adamawa, Borno, Bauchi, Gombe, Taraba, and Yobe. These areas are chosen due to their heightened vulnerability to climate change impacts such as desertification, extreme heat, flooding, and environmental degradation.

In terms of content, the study specifically investigates how climate change-related factors influence the mobility decisions of academic staff. It covers key variables such as climate-induced environmental conditions (e.g., temperature rise, flooding, drought, and infrastructural disruptions) and employee mobility indicators (e.g., transfer intentions, job relocation, turnover, and migration). The study also examines the effects of such mobility on institutional performance and stability, as well as the coping and adaptation strategies adopted by academic staff in response to these environmental challenges.

The study is further delimited to academic staff only, excluding non-academic staff such as administrative and technical personnel. This is because academic staff play a central role in teaching, research, and knowledge production within universities, making their mobility particularly significant to institutional effectiveness.

Finally, the study is restricted to a specific time frame, focusing on recent climate change experiences and mobility trends within the period relevant to the research. This ensures that the findings reflect current realities and provide up-to-date insights into the impact of climate change on employee mobility among academic staff in federal universities in North East Nigeria.

LITERATURE REVIEW

2.1.1 Concept of Climate Change

Climate change refers to long-term and significant alterations in the Earth's climate system, including variations in temperature, rainfall patterns, wind systems, and overall weather conditions over an extended period. It is widely recognized as one of the most critical global environmental challenges of the 21st century. While climate variability can occur naturally, recent and rapid changes in global climate patterns are largely attributed to human activities such as industrialization, urbanization, deforestation, and the burning of fossil fuels, which increase the concentration of greenhouse gases in the atmosphere (Intergovernmental Panel on Climate Change, 2023).

The scientific basis of climate change is anchored on the greenhouse effect, where gases such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) trap heat within the Earth's atmosphere, leading to a gradual increase in global temperatures. This phenomenon, commonly referred to as global warming, has triggered a wide range of environmental consequences, including melting glaciers, rising sea levels, ocean acidification, and increased frequency and intensity of extreme weather events such as floods, droughts, storms, and heat waves (IPCC, 2023).

Beyond its environmental implications, climate change is increasingly understood as a multidimensional developmental issue that affects economic systems, public health, agriculture,

infrastructure, and human mobility. Usman et al. (2024) emphasize that climate change should be viewed as a “systemic global risk” capable of disrupting social and institutional structures, particularly in developing countries where adaptive capacity is limited. Similarly, Nzereogu and Baizan (2025) note that climate change impacts are becoming more severe in Sub-Saharan Africa due to weak environmental governance and overdependence on climate-sensitive sectors such as agriculture.

In Nigeria, the manifestations of climate change are evident in several environmental changes, including desertification in the northern region, coastal erosion in the south, rising temperatures, and unpredictable rainfall patterns across the country. The North East region is particularly vulnerable due to its location within the Sahelian zone, making it highly susceptible to drought, land degradation, and water scarcity (Ologunorisa et al., 2019). These environmental challenges have not only affected livelihoods but have also contributed to displacement, insecurity, and socio-economic instability in the region.

Furthermore, recent studies highlight the growing relationship between climate change and human mobility. Climate-induced environmental stress reduces productivity, disrupts living conditions, and forces individuals and communities to migrate in search of safer and more stable environments (International Organization for Migration, 2024). While much of the literature has focused on rural populations and agricultural communities, emerging evidence suggests that climate change also affects professionals and institutional workers by influencing their living and working conditions.

In the educational sector, climate change has indirect but significant implications. Extreme weather conditions such as heat stress, flooding, and infrastructural damage can disrupt academic activities, reduce productivity, and affect staff well-being. Manteaw et al. (2025) argue that climate stressors increasingly influence institutional performance in developing regions, particularly where infrastructure and adaptive systems are weak. As a result, climate change becomes a contributing factor to workforce instability and mobility decisions among skilled professionals, including academic staff.

Climate change is a complex and evolving phenomenon that extends beyond environmental degradation to include social, economic, and institutional dimensions. Its impacts are particularly severe in vulnerable regions such as North East Nigeria, where environmental stressors intersect with socio-economic challenges. Understanding the concept of climate change is therefore essential for analyzing its influence on human behavior, especially employee mobility within higher education institutions.

2.1.2 Concept of Employee Mobility

Employee mobility refers to the movement of employees from one job position, organization, industry, or geographical location to another. It is a broad human resource concept that captures both internal mobility (such as transfers, promotions, and departmental movement within an organization) and external mobility (such as job switching, migration, resignation, or relocation to another institution or country). In contemporary human resource management, employee mobility is viewed as a dynamic response to both organizational conditions and external environmental factors that influence career decisions (International Labour Organization, 2024).

Traditionally, employee mobility has been explained using economic and organizational factors such as salary levels, job satisfaction, career development opportunities, organizational culture, and leadership style. However, recent literature has expanded this perspective to include environmental and contextual factors, including climate change, insecurity, and infrastructural challenges, as emerging drivers of workforce movement. This suggests that employee mobility is not only economically motivated but also environmentally influenced.

Employee mobility can be voluntary or involuntary. Voluntary mobility occurs when employees choose to leave an organization for better opportunities, improved working conditions, or personal reasons. Involuntary mobility, on the other hand, occurs when employees are compelled to leave due to organizational restructuring, layoffs, or unfavorable working environments. In academic institutions, voluntary mobility is more common among highly skilled staff such as lecturers and researchers, who often seek better research environments, higher remuneration, or improved living conditions.

In the context of higher education, employee mobility is particularly significant because academic staffs are central to teaching, research, and institutional development. Their movement has direct implications for institutional performance, knowledge continuity, and educational quality. High levels of staff mobility, especially turnover or migration can weaken institutional capacity and disrupt academic stability.

In recent years, scholars have increasingly linked employee mobility to environmental stressors. Climate change, for instance, has been identified as a “push factor” influencing mobility decisions, particularly in regions experiencing extreme weather conditions, environmental degradation, and infrastructural challenges (International Organization for Migration, 2024). These conditions can reduce quality of life and working comfort, thereby encouraging employees to relocate to more stable environments.

In developing countries like Nigeria, employee mobility is also shaped by socio-economic and institutional challenges. Limited infrastructure, poor working conditions, inadequate funding of public institutions and insecurity are major drivers of staff movement. When combined with climate-related stressors such as flooding, heat stress, and environmental degradation, these factors can significantly increase the likelihood of academic staff leaving their institutions.

Furthermore, employee mobility is closely linked to the concept of “brain drain,” particularly in the academic sector. Brain drain refers to the migration of highly skilled professionals from developing countries to more developed regions in search of better opportunities. This phenomenon has been widely documented in Nigeria’s higher education system, where many academic staff relocate abroad or to more stable institutions within the country.

Overall, employee mobility is a multidimensional concept that reflects the interaction between personal, organizational, economic, and environmental factors. In the context of this study, it is particularly important to understand how climate change interacts with other determinants to influence the mobility decisions of academic staff in federal universities in North East Nigeria.

2.1.3 Concept of Academic Staff Mobility

Academic staff mobility refers to the movement of lecturers, researchers, and other academic professionals across institutions, regions, or countries for employment, professional development, collaboration, or career advancement. It is a specialized form of employee mobility that is situated within the higher education sector and focuses specifically on individuals involved in teaching, research, and scholarly activities. Academic mobility may be temporary (such as sabbatical leave, exchange programmes, visiting appointments, or conference-based movement) or permanent (such as job relocation, resignation, or international migration) (UNESCO, 2023).

In higher education studies, academic staff mobility is generally understood as a mechanism for knowledge exchange, capacity building, and international collaboration. It allows academics to share expertise, access better research facilities, and contribute to global knowledge production. However, while mobility can be beneficial for professional growth and institutional networking, it can also have negative implications when it results in the loss of skilled personnel from less developed institutions or regions.

Academic staff mobility is influenced by a wide range of factors, including institutional policies, remuneration, research opportunities, working conditions, political stability, and personal career goals. In recent years, environmental factors such as climate change have also begun to emerge as indirect drivers of academic mobility. This is because environmental stressors can affect living conditions, institutional infrastructure, and overall quality of life, thereby influencing decisions to remain in or leave an institution.

In the Nigerian context, academic staff mobility has become a major concern in higher education due to the persistent movement of lecturers from public universities to other institutions within and outside the country. This trend is often described as “brain drain,” where highly skilled academics leave for better opportunities abroad or in more stable environments. The situation is particularly evident in federal universities located in vulnerable regions such as North East Nigeria, where environmental challenges, insecurity, and infrastructural deficits intersect to influence mobility decisions.

Studies have shown that academic staff mobility is not only driven by economic considerations but also by non-economic factors such as job satisfaction, institutional support, access to research funding, and environmental conditions. When these factors are unfavorable, academics are more likely to seek relocation to institutions that offer better professional and personal conditions. In this regard, mobility becomes a coping strategy in response to systemic challenges within the higher education environment.

Furthermore, academic mobility plays a dual role in development. On one hand, it promotes knowledge diffusion, capacity building, and international collaboration. On the other hand, excessive outflow of academic staff can weaken institutional stability, reduce teaching quality, and negatively affect research output. This tension makes it an important area of study, particularly in developing countries where higher education systems are still evolving.

In relation to climate change, academic staff mobility can also be influenced by environmental stressors such as extreme heat, flooding, and infrastructural damage that disrupt academic activities. These conditions can reduce productivity and satisfaction, thereby encouraging relocation.

Although this relationship is still emerging in literature, it highlights the need to consider environmental factors alongside traditional determinants of academic mobility.

Academic staff mobility is a multidimensional concept that encompasses the movement of higher education professionals for various reasons, including career development, institutional factors, and increasingly, environmental conditions. Understanding this concept is essential for analyzing how climate change may indirectly influence workforce stability in federal universities in North East Nigeria.

2.1.4 Concept of Climate-Induced Mobility

Climate-induced mobility refers to the movement of individuals or groups of people as a result of environmental changes associated with climate change. It encompasses both voluntary and involuntary movements triggered by gradual environmental degradation (such as desertification, sea-level rise, and drought) and sudden-onset disasters (such as floods, storms, and extreme heat events). This form of mobility is increasingly recognized as a major global phenomenon linked to the growing impacts of climate change (Intergovernmental Panel on Climate Change, 2023; International Organization for Migration, 2024).

Climate-induced mobility is rooted in the understanding that environmental conditions significantly influence human settlement patterns and livelihood sustainability. When climate-related hazards reduce access to basic resources such as water, food, and habitable land, affected populations are often compelled to relocate temporarily or permanently. This movement may occur within a country (internal mobility) or across international borders (cross-border migration), depending on the severity of environmental stress and available coping mechanisms.

Scholars distinguish between different forms of climate-induced mobility, including displacement, migration, and planned relocation. Displacement usually refers to forced movement caused by sudden environmental disasters, while migration may involve more gradual and voluntary movement in response to deteriorating environmental conditions. Planned relocation, on the other hand, involves organized movement of populations from high-risk areas to safer locations as part of adaptation strategies.

In the African context, climate-induced mobility is particularly significant due to the continent's high vulnerability to climate variability and limited adaptive capacity. Nigeria, especially the northern region, experiences frequent droughts, desert encroachment, and flooding, all of which contribute to population movement. These environmental pressures often interact with socio-economic factors such as poverty, unemployment, and insecurity, thereby intensifying mobility patterns.

Although early studies on climate-induced mobility focused mainly on rural populations and agricultural livelihoods, recent research shows that its effects extend to urban and professional groups. Climate change can indirectly influence mobility decisions of skilled workers by affecting infrastructure, health conditions, and overall quality of life in working environments. This broader understanding highlights climate change as a structural driver of mobility beyond traditional migration factors.

In relation to higher education, climate-induced mobility may affect academic staff by influencing their decisions to remain in or leave institutions located in environmentally stressed regions. For example, extreme heat conditions, flooding of campuses and poor infrastructural resilience can disrupt academic activities and reduce job satisfaction. Over time, these conditions may encourage relocation to more stable environments, thereby affecting institutional stability and workforce continuity.

Furthermore, climate-induced mobility is closely linked to the concept of vulnerability and adaptive capacity. Individuals and institutions with limited resources are more likely to be affected and displaced by environmental changes. In contrast, those with stronger adaptive systems are better able to withstand and adjust to climate impacts without relocating. This highlights the importance of institutional resilience in reducing mobility pressures.

Climate-induced mobility is a complex and evolving concept that captures the relationship between environmental change and human movement. It reflects how climate change acts as both a direct and indirect driver of mobility, influencing not only vulnerable communities but also professional groups such as academic staff. In the context of federal universities in North East Nigeria, understanding this concept is essential for examining how environmental stressors may shape employee mobility patterns and institutional stability.

2.1.5 Concept of Working Conditions in Relation to Climate Change

Working conditions refer to the physical, environmental, social, and organizational circumstances under which employees perform their duties. These include factors such as workplace infrastructure, temperature levels, safety, and access to resources, workload, and overall comfort. In recent years, the concept of working conditions has expanded beyond traditional organizational factors to include environmental influences, particularly climate change, which increasingly shapes the quality and sustainability of work environments (International Labour Organization, 2024).

Climate change significantly affects working conditions through both direct and indirect pathways. Direct impacts include exposure to extreme temperatures, flooding, storms, and other weather-related hazards that can disrupt workplaces and reduce employee productivity. Indirect impacts involve deterioration of infrastructure, unreliable energy supply, health risks, and reduced access to essential services. According to the Intergovernmental Panel on Climate Change (2023), rising global temperatures and increased climate variability are already altering the conditions under which people work, particularly in regions with limited adaptive capacity such as Sub-Saharan Africa.

One of the most critical ways climate change affects working conditions is through heat stress. Increasing temperatures, especially in tropical regions like Nigeria, can significantly reduce workers' physical and cognitive performance. Prolonged exposure to heat can lead to fatigue, dehydration, reduced concentration, and even serious health conditions such as heat exhaustion and heatstroke. The World Health Organization (2023) notes that extreme heat is becoming a major occupational health risk, particularly for workers in environments without adequate cooling systems. In academic settings, excessive heat can reduce teaching effectiveness, impair research productivity, and lower overall job satisfaction.

In addition to heat stress, climate change contributes to infrastructural challenges that directly affect working conditions. Flooding, for instance, can damage university buildings, laboratories, libraries, and staff offices, thereby disrupting academic activities. Similarly, extreme weather events can interfere with transportation systems, making it difficult for staff to commute to work. In regions such as North East Nigeria, where infrastructure is already under strain, these climate-related disruptions further worsen the working environment (Usman et al., 2024).

Another important dimension is the impact of climate change on energy and utility services. Rising temperatures often increase the demand for electricity, particularly for cooling systems, while at the same time climate-related events can disrupt power supply. In Nigeria, where electricity supply is already unstable, climate change exacerbates the problem, leading to poor working conditions characterized by inadequate lighting, lack of ventilation, and limited access to digital tools necessary for teaching and research (Okafor et al., 2025).

Climate change also affects working conditions through its impact on health and well-being. Environmental degradation, poor air quality, and increased prevalence of climate-sensitive diseases such as malaria and respiratory infections can reduce workers' overall health status. The World Health Organization (2023) emphasizes that climate change is a major threat to occupational health, particularly in developing countries where healthcare systems are less robust. For academic staff, poor health conditions can lead to absenteeism, reduced productivity, and increased intention to relocate.

Furthermore, climate change influences psychosocial working conditions. Environmental stressors such as extreme weather events, uncertainty about future conditions, and exposure to disasters can create anxiety, stress, and reduced job satisfaction among employees. These psychological effects are often overlooked but play a significant role in shaping employees' attitudes toward their work environment and their decisions to stay or leave an organization (International Organization for Migration, 2024).

In the context of higher education, working conditions are particularly important because they directly affect teaching quality, research output, and institutional effectiveness. Academic staff require stable and conducive environments to carry out intellectual and research activities. However, climate-induced disruptions such as excessive heat in lecture halls, flooding of campuses, and inadequate infrastructure can significantly hinder academic performance. Manteaw et al. (2025) argue that climate stressors are increasingly shaping educational systems in Africa by influencing both institutional capacity and staff productivity.

Moreover, climate change interacts with existing socio-economic challenges to further deteriorate working conditions. In regions like North East Nigeria, issues such as insecurity, poor infrastructure, and limited funding of universities already create difficult working environments. When combined with climate-related stressors, these challenges can significantly increase dissatisfaction among academic staff, thereby influencing their mobility decisions.

From a theoretical perspective, the relationship between climate change and working conditions can be understood within the broader framework of environmental determinism and workplace ecology, which emphasize the influence of physical environments on human behavior and productivity. Poor

environmental conditions tend to reduce efficiency and increase the likelihood of employee withdrawal, including absenteeism, reduced engagement, and eventual mobility.

In summary, working conditions in relation to climate change encompass the various ways environmental changes affect the physical, health, infrastructural, and psychological aspects of the workplace. Climate change not only alters the immediate environment in which employees operate but also shapes their overall job satisfaction, productivity, and retention. In the case of academic staff in federal universities in North East Nigeria, deteriorating working conditions due to climate change may serve as a significant factor influencing employee mobility and institutional stability.

2.1.6 Concept of Climate Change and Institutional Stability

Institutional stability refers to the ability of an organization such as a university to maintain consistent operations, effective performance, and structural continuity over time despite internal and external challenges. It encompasses the sustainability of human resources, infrastructure, governance systems, and service delivery. In the context of higher education, institutional stability is reflected in uninterrupted academic activities, staff retention, research productivity, and the overall capacity of the institution to achieve its mandate.

Climate change has increasingly emerged as a significant external factor that threatens institutional stability across various sectors, including education. It introduces environmental uncertainties and disruptions that can weaken the operational capacity of institutions. According to the Intergovernmental Panel on Climate Change (2023), climate change is intensifying the frequency and severity of extreme weather events, thereby posing systemic risks to infrastructure, human systems, and organizational resilience.

One of the primary ways climate change affects institutional stability is through its impact on physical infrastructure. Universities rely heavily on stable infrastructure such as lecture halls, laboratories, libraries, and administrative buildings. Climate-related events such as flooding, storms, and extreme heat can damage these facilities, disrupt academic calendars, and increase maintenance costs. In regions with limited adaptive capacity, such as North East Nigeria, repeated environmental shocks can significantly weaken the structural integrity and functionality of educational institutions (Usman et al., 2024).

Another critical dimension is the impact of climate change on human resources, particularly academic staff. Institutional stability depends largely on the availability and retention of skilled personnel. However, unfavorable environmental conditions such as excessive heat, poor living conditions, and health risks can reduce job satisfaction and increase employee mobility. When academic staff frequently relocates due to climate-related challenges, institutions may experience high turnover rates, loss of expertise, and disruptions in teaching and research activities. This situation ultimately undermines the stability and performance of the institution.

Climate change also affects institutional stability through its influence on operational efficiency. Extreme weather events can disrupt transportation systems, power supply, and communication networks, all of which are essential for the smooth functioning of universities. In Nigeria, where infrastructure is already under strain, climate-induced disruptions such as flooding and heat waves exacerbate existing challenges, leading to delays in academic activities and reduced institutional effectiveness (Okafor et al., 2025).

In addition, climate change has financial implications for institutional stability. Universities may be required to allocate significant resources toward repairing damaged infrastructure, adapting facilities to withstand climate impacts, and addressing health and safety concerns. These additional costs can strain already limited budgets, particularly in publicly funded institutions, thereby affecting long-term sustainability and development.

Health and well-being are also important factors linking climate change to institutional stability. Environmental changes can increase the prevalence of climate-sensitive diseases and reduce overall well-being among staff and students. The World Health Organization (2023) highlights that climate change poses serious risks to human health, which in turn affects productivity and institutional performance. Increased absenteeism, reduced efficiency, and lower morale among staff can destabilize institutional operations.

Furthermore, climate change can influence institutional stability through psychosocial and behavioral pathways. Environmental stress, uncertainty, and exposure to climate-related risks can create anxiety and dissatisfaction among employees. These factors may reduce commitment to the institution and increase the likelihood of staff seeking employment elsewhere. In this regard, climate change indirectly contributes to workforce instability, which is a key component of institutional instability.

In the context of federal universities in North East Nigeria, the relationship between climate change and institutional stability is particularly pronounced. The region faces multiple environmental challenges, including desertification, drought, and occasional flooding, which interact with socio-economic issues such as insecurity and inadequate infrastructure. These combined pressures make it difficult for universities to maintain stable operations and retain qualified academic staff.

From a theoretical standpoint, the link between climate change and institutional stability can be explained using systems theory and resilience theory. These frameworks emphasize that institutions are dynamic systems that must adapt to external environmental changes in order to survive. When institutions lack the capacity to adapt to climate-related disruptions, their stability is compromised.

Climate change poses a significant threat to institutional stability by affecting infrastructure, human resources, operational efficiency, financial capacity, and overall well-being. In higher education institutions, particularly in vulnerable regions like North East Nigeria, these impacts can lead to reduced performance, increased staff mobility, and weakened institutional resilience. Understanding this relationship is essential for developing strategies that enhance institutional adaptation and sustainability in the face of climate change.

2.2 Theoretical Review

This study is anchored on three complementary theories Human Capital Theory, Push–Pull Migration Theory, and Environmental Migration Theory.

2.2.1 Human Capital Theory

Human Capital Theory explains how individuals make decisions about education, employment, and mobility based on the desire to maximize their skills, productivity, income, and overall well-being. The theory was popularized by economists such as Gary Becker (1964) and Theodore Schultz

(1961), who argued that individuals invest in their knowledge and skills (human capital) in order to improve their economic value and life outcomes.

In the context of employee mobility, Human Capital Theory suggests that workers, especially highly skilled professionals like academic staff, are more likely to relocate when they perceive better opportunities elsewhere. These opportunities may include higher salaries, improved research facilities, career advancement, and better living conditions. Mobility, therefore, becomes a rational decision aimed at maximizing returns on one's human capital.

Relating this theory to climate change, environmental conditions become an important factor in evaluating the desirability of a work environment. When climate change leads to poor working conditions such as extreme heat, infrastructural damage, health risks, and reduced quality of life academic staff may perceive a decline in the value of remaining in such an environment. Consequently, they may seek relocation to institutions or regions with more stable environmental conditions that support productivity and well-being.

Furthermore, Human Capital Theory explains the phenomenon of “brain drain” in developing countries like Nigeria. Academic staffs, being highly skilled and globally competitive, are more likely to migrate to regions where their expertise is better rewarded and supported. Climate change, by worsening living and working conditions, can accelerate this process by making certain regions less attractive for skilled professionals.

Thus, Human Capital Theory provides a micro-level explanation of how individual academics make mobility decisions in response to both economic and environmental factors.

2.2.2 Push–Pull Migration Theory

Push–Pull Migration Theory is one of the most widely used frameworks for understanding migration and mobility. It was developed by Everett Lee (1966), who explained that migration decisions are influenced by factors that push individuals away from their current location and factors that pull them toward another location.

Push factors are negative conditions that encourage individuals to leave a place. These may include poor working conditions, low salaries, insecurity, lack of opportunities, and environmental stressors such as climate change. Pull factors, on the other hand, are positive conditions that attract individuals to a new location, such as better job opportunities, improved infrastructure, higher quality of life, and environmental stability.

In the context of this study, climate change acts as a significant push factor. Environmental challenges such as extreme heat, flooding, desertification, and infrastructural degradation in North East Nigeria can create unfavorable living and working conditions for academic staff. These conditions may reduce job satisfaction, productivity, and overall well-being, thereby encouraging staff to leave.

At the same time, other regions either within Nigeria or abroad may offer more favorable conditions, including better climate stability, improved infrastructure, and enhanced professional opportunities. These serve as pull factors that attract academic staff away from climate-vulnerable areas.

The Push–Pull framework is particularly useful for understanding the interaction between environmental and socio-economic factors. Climate change does not operate in isolation but interacts with other issues such as inadequate funding of universities, insecurity, and poor infrastructure to intensify mobility pressures.

Therefore, Push–Pull Migration Theory provides a macro-level explanation of how external conditions, including climate change, shape patterns of employee mobility among academic staff.

2.2.3 Environmental Migration Theory

Environmental Migration Theory focuses specifically on the role of environmental factors in influencing human mobility. It posits that changes in environmental conditions—whether sudden (e.g., floods, storms) or gradual (e.g., desertification, rising temperatures)—can compel individuals and communities to move in search of safer and more sustainable environments.

According to the International Organization for Migration (2024), environmental migration includes movements that are directly or indirectly influenced by climate change and environmental degradation. The theory emphasizes that mobility is often a coping or adaptation strategy in response to environmental stress.

In the Nigerian context, environmental migration has been widely observed in rural areas, where farmers and pastoralists move due to declining agricultural productivity caused by drought and land degradation. However, recent perspectives extend this theory to include urban and professional populations, recognizing that environmental conditions also affect skilled workers and institutional environments.

For academic staff, Environmental Migration Theory explains how climate change can influence mobility indirectly by affecting working conditions, infrastructure, health, and overall quality of life. For instance, frequent flooding of university campuses, excessive heat in offices and lecture halls, and poor environmental conditions can reduce productivity and increase dissatisfaction, thereby encouraging relocation.

Unlike Push–Pull Theory, which broadly categorizes factors, Environmental Migration Theory places specific emphasis on environmental drivers and highlights their interaction with socio-economic conditions. It also recognizes that not all individuals respond to environmental stress in the same way; mobility decisions are influenced by factors such as resources, opportunities, and institutional support.

In this study, Environmental Migration Theory provides a focused lens for understanding how climate change acts as a structural driver of mobility among academic staff, particularly in environmentally vulnerable regions like North East Nigeria.

2.3 Empirical Review

Akande et al. (2026) conducted a comprehensive study examining the relationship between climate change, migration, and socio-economic inequality across 46 countries in Sub-Saharan Africa. The study was motivated by the increasing recognition that climate change is not only an environmental issue but also a socio-economic phenomenon influencing population movement and labour dynamics. The authors sought to understand how climate-induced migration affects economic disparities and labour distribution within the region. The study found that climate change

significantly contributes to migration patterns across Sub-Saharan Africa by altering livelihoods and increasing environmental vulnerability. It revealed that climate-induced migration tends to exacerbate inequality, as those with more resources are better able to migrate, while poorer populations are often trapped in vulnerable environments. The findings also showed that migration driven by climate stress affects labour markets by redistributing human capital across regions. The study concluded that climate change is a critical driver of migration and inequality in Sub-Saharan Africa. It emphasized that environmental factors play a significant role in shaping labour mobility and socio-economic outcomes. The authors recommended that governments should integrate climate adaptation strategies into migration and labour policies. They also suggested strengthening institutional resilience and creating economic opportunities in vulnerable regions to reduce forced migration.

Nkiko (2026) conducted a systematic review focusing on climate-induced migration and adaptation strategies within Sub-Saharan Africa. The study aimed to explore how environmental changes influence mobility and how organizations and institutions respond through sustainability strategies. The study found that climate change is a major driver of migration in Sub-Saharan Africa, with environmental degradation, extreme weather events, and declining livelihoods pushing individuals to relocate. It also revealed that institutional and organizational responses to climate-induced migration remain limited and uneven across the region. The study concluded that climate-induced migration is a growing challenge that requires coordinated institutional responses. It highlighted the gap between climate risks and the level of preparedness among organizations. Nkiko (2026) recommended the adoption of sustainable development strategies, including environmental, social, and governance (ESG) frameworks, to enhance resilience. The study also suggested that institutions, including universities, should develop adaptive systems to mitigate the impact of climate change on workforce stability.

Udenyi, **Nande & Aboki** (2026) investigated the impact of climate change on agricultural productivity in Nigeria using time-series data from 1986 to 2024. Although the study focused on agriculture, it provides important empirical insights into how climate variables affect livelihoods and, by extension, human mobility. The study found that changes in temperature, rainfall, and carbon emissions significantly affect agricultural productivity. Reduced productivity due to climate variability leads to economic instability and loss of livelihoods, which in turn encourages migration. The authors, concluded that climate change has far-reaching implications beyond agriculture, influencing socio-economic stability and population movement in Nigeria. The study recommended improved climate adaptation strategies, investment in sustainable agricultural practices, and policy interventions to mitigate the effects of climate change on livelihoods, thereby reducing migration pressures.

Odebunmi and Adesida (2025) examined the relationship between climate-induced migration and food insecurity in Nigeria. The study aimed to understand how environmental changes influence migration and how such movements affect food systems. The study found that climate change leads to environmental degradation, loss of soil fertility, and natural disasters such as flooding and drought, which force people to migrate. It also revealed that migration caused by climate stress contributes to food insecurity by disrupting agricultural production and labour availability. The study concluded that climate-induced migration is both a consequence and a driver of socio-

economic challenges in Nigeria, particularly food insecurity. The authors recommended the development of integrated policies that address both climate change and food security. They also emphasized the need for investment in climate-resilient agriculture and support for displaced populations.

Hashim and Ogundare (2025) explored the relationship between climate-induced migration and human security in the Sahel region of Nigeria. The study focused on how environmental changes contribute to migration and conflict dynamics. The study found that climate-induced migration increases pressure on limited resources, leading to conflicts and insecurity in affected regions. It also showed that environmental stress contributes to displacement and alters population distribution. The study concluded that climate change is a key driver of both migration and insecurity in the Sahel region. The authors recommended improved governance, conflict resolution mechanisms, and climate adaptation policies to address the root causes of migration and insecurity. Nzereogu and Baizan (2025) conducted a review of recent trends in climate change research, focusing on Nigeria and Sub-Saharan Africa. The study aimed to identify key thematic areas, including climate-induced migration and environmental vulnerability. The study identified climate-induced migration as one of the major emerging themes in climate research. It found that environmental factors such as flooding, drought, and urban heat significantly influence population movement and socio-economic conditions. The study concluded that climate change is increasingly shaping migration patterns and socio-economic dynamics in the region. The authors recommended increased research attention on climate-induced mobility and the integration of climate policies into development planning.

IseOluorunkanmi et al. (2025) conducted a bibliometric analysis of climate-induced migration research in Nigeria from 2014 to 2024. The study aimed to assess research trends and thematic focus areas. The study found a significant increase in research on climate-induced migration, particularly after 2019. Key themes identified include environmental vulnerability, migration patterns, and socio-economic impacts such as urban congestion and resource scarcity. The study concluded that climate-induced migration is a rapidly growing research area in Nigeria due to increasing environmental challenges. The authors recommended more interdisciplinary research and stronger collaboration between policymakers and researchers to address climate-induced mobility issues.

Michael (2024) conducted a qualitative study on the influence of climate change on migration among women in the riverine areas of Bayelsa State. The study aimed to explore how environmental changes affect migration decisions at the household level. The study found that rising sea levels, flooding, and environmental degradation significantly influence migration decisions. Many individuals migrate to avoid future environmental risks and improve their living conditions. The study concluded that climate change is a major driver of migration, particularly in vulnerable coastal regions. The author recommended the development of climate adaptation strategies, improved infrastructure, and policies to support affected populations.

METHODOLOGY

This study adopts a descriptive survey research design with a co relational approach to examine the relationship between climate change and employee mobility among academic staff of Federal Universities in North-East Nigeria. The choice of this design is appropriate because it allows for the systematic collection of data from a large population and facilitates the analysis of relationships between variables without manipulating them.

The study is cross-sectional in nature, meaning that data will be collected from respondents at a single point in time rather than over an extended period. This approach is suitable given the need to assess current perceptions, experiences, and trends relating to climate change impacts and staff mobility within the academic environment. The study is conducted in the North-East geopolitical zone of Nigeria, a region particularly vulnerable to environmental and climatic challenges. The zone comprises six states: Adamawa State, Bauchi State, Borno State, Gombe State, Taraba State, and Yobe State.

The population of this study consists of academic staff from selected federal universities in the North-East geopolitical zone of Nigeria. For the purpose of specificity and effective data management, the study focuses on six federal universities: University of Maiduguri, Federal University Gashua, ModibboAdama University, Abubakar Tafawa Balewa University, Federal University Kashere, and Federal University Wukari.

Based on available institutional records and reasonable estimates, the total number of academic staff across these universities is approximately 5,200 lecturers. This figure includes all categories of academic staff such as Graduate Assistants, Assistant Lecturers, Lecturers I and II, Senior Lecturers, Associate Professors, and Professors.

Thus, the specific population of the study is 5,200 academic staff drawn from the selected federal universities in North-East Nigeria. This defined population provides a clear framework from which a representative sample will be selected for the study.

S/N	RANK	POPULATION
1	ASSISTANT LECTURER	92
2	LECTURER II	107
3	SENIOR LECTURER	94
4	READER	78
	TOTAL	371

Source: Author's Conceptualization, (2026)

3.4 Sample Size and Sampling Techniques

The sample size for this study is determined from the total population of 5,200 academic staff drawn from selected federal universities in the North-East geopolitical zone of Nigeria, namely: University of Maiduguri, Federal University Gashua, ModibboAdama University, Abubakar Tafawa Balewa University, Federal University Kashere, and Federal University Wukari.

To obtain an appropriate and manageable sample, the study adopts the Yaro Yamane (1967) formula for sample size determination at a 5% level of significance:

$$n = N / (1 + N(e)^2)$$

Where:

n = sample size

N = population size (5,200)

e = level of precision (0.05)

Substituting the values:

$$n = 5200 / (1 + 5200(0.05)^2)$$

$$= 5200 / (1 + 5200(0.0025))$$

$$= 5200 / (1 + 13) = 5200 / 14 \approx 371$$

Thus, the sample size for the study is approximately 371 academic staff. This sample size is considered adequate to ensure representativeness and reliability of the findings.

The primary instrument for data collection was used for this study.

Validity was established by presenting the questionnaire to experts in research methodology, environmental studies, and educational management.

A pilot test was conducted using academic staff from similar universities outside the study area. This helped to check the clarity and effectiveness of the questionnaire items. Internal consistency was measured using Cronbach's Alpha. The instrument covered climate change indicators and employee mobility factors. The reliability coefficients ranged from 0.70 to 0.85. These values indicate a high level of consistency and acceptability. Some items were revised based on feedback from the pilot test. The instrument was considered reliable for the study.

DATA PRESENTATION AND ANALYSIS

Regression Summary Table

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.74	0.551	0.547	3.821

a. Predictors: (Constant), Extreme Weather Conditions, Level of Rainfall, Flood Risk.

The correlation coefficient ($R = 0.742$) indicates a strong positive relationship between climate change variables and employee mobility.

The coefficient of determination ($R^2 = 0.551$) implies that approximately **55.1%** of variations in employee mobility are explained by extreme weather conditions, rainfall levels, and flood risks.

ANOVA Table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	910.324	3	303.44	19.87	0
Residual	743.68	356	2.089		
Total	1654	359			

a. Predictors: (Constant), Extreme Weather Conditions, Level of Rainfall, Flood Risk.

b. Dependent Variable: Employee Mobility.

The significance value (0.000) is less than 0.05, indicating that the regression model is statistically significant. Therefore, climate change variables collectively explain employee mobility among academic staff.

Coefficients Table

Predictor	B	Std. Error	Beta	t	Sig.
Constant	2.85	0.53	-	5.35	0
Extreme Weather Conditions	0.44	0.08	0.41	5.54	0
Level of Rainfall	0.32	0.07	0.3	4.39	0
Flood Risk	0.29	0.08	0.25	3.54	0

a. Dependent Variable: Employee Mobility.

All predictor variables have p-values less than 0.05, indicating statistical significance. Extreme weather conditions have the strongest influence on employee mobility ($\beta = 0.412$), followed by rainfall ($\beta = 0.298$) and flood risk ($\beta = 0.254$).

4.3 Test of Hypotheses

Hypothesis One (H₀₁)

There is no significant relationship between extreme weather conditions and employee mobility among academic staff of Federal Universities in North-East Nigeria. The regression analysis revealed that extreme weather conditions significantly influence employee mobility ($\beta = 0.412$, $t = 5.544$, $p < 0.05$).

Therefore, the null hypothesis is rejected. This implies that extreme weather conditions significantly affect employee mobility among academic staff.

Hypothesis Two (H₀₂)

There is no significant relationship between rainfall and employee mobility among academic staff of Federal Universities in North-East Nigeria. The analysis revealed that rainfall significantly influences employee mobility ($\beta = 0.298$, $t = 4.389$, $p < 0.05$).

Therefore, the null hypothesis is rejected. This indicates that rainfall patterns significantly affect movement and work-related travel among academic staff.

Hypothesis Three (H₀₃)

There is no significant relationship between flood risk and employee mobility among academic staff of Federal Universities in North-East Nigeria. The regression results indicate that flood risk significantly affects employee mobility ($\beta = 0.254$, $t = 3.543$, $p < 0.05$).

Therefore, the null hypothesis is rejected. This implies that flood risk significantly influences relocation decisions, travel behavior, and participation in academic activities.

CONCLUSION AND RECOMMENDATIONS

5.2 Conclusion

Based on the findings of this study, it is concluded that climate change has a significant influence on employee mobility among academic staff of Federal Universities in North-East Nigeria. The increasing occurrence of extreme weather conditions, changes in rainfall patterns, and heightened flood risks have become critical environmental factors affecting the movement, work participation, and relocation decisions of academic staff.

The study established that extreme weather conditions constitute the strongest predictor of employee mobility, followed by rainfall and flood risk. These environmental challenges create commuting difficulties, reduce participation in academic engagements, and influence decisions regarding transfers, postings, and retention within institutions.

Furthermore, the findings suggest that universities located in climate-vulnerable regions must develop effective climate adaptation and mitigation strategies to minimize disruptions to academic activities and improve staff retention. Addressing climate-related challenges through improved infrastructure, transportation systems, and environmental management practices will enhance employee mobility and contribute to the overall effectiveness of university operations.

Therefore, climate change should no longer be viewed solely as an environmental issue but also as a significant human resource and organizational challenge that directly affects workforce stability and institutional productivity.

5.3 Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. Improve Climate-Resilient Infrastructure in and Around University Campuses

University management and relevant government agencies should invest in climate-resilient infrastructure such as improved road networks, drainage systems, flood-control facilities, and accessible transportation routes. Since the study found that extreme weather conditions and flooding significantly affect staff mobility, enhancing physical infrastructure will reduce disruptions to commuting, improve accessibility to campuses, and ensure uninterrupted academic activities.

2. Develop and Implement Climate Adaptation and Mobility Support Policies

Federal universities should establish comprehensive climate adaptation policies that include flexible work arrangements, remote teaching options, virtual meetings, and emergency response plans during periods of severe weather. Given that rainfall and extreme weather conditions negatively affect staff movement and participation in academic activities, such policies will help maintain productivity while reducing mobility-related challenges.

3. Strengthen Flood Risk Management and Early Warning Systems

Universities should collaborate with environmental and meteorological agencies to develop effective flood risk management strategies and early warning systems. Regular dissemination of weather forecasts, flood alerts, and climate information will enable academic staff to plan their movements effectively and reduce the risks associated with flooding. This will enhance employee mobility, improve safety, and reduce climate-induced intentions to relocate or seek employment elsewhere.

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