POLICY RECOMMENDATIONS

This study recommends an integrated policy approach.

The Federal and State Ministries of Agriculture, in collaboration with relevant stakeholders, should implement a comprehensive policy approach to enhance agricultural resilience and sustainable development in the study area. This entails providing farmers with improved technology and resilient seeds, addressing rural-urban migration by creating an enabling environment and infrastructure, optimizing barren lands for profitable agricultural and housing use to boost food security, and reducing housing deficits.

Additionally, decision-makers at both state and federal levels should formulate policies aligned with Sustainable Development Goals, encompassing climate action, land use, internal migration, food production, and food security.

The policy should also prioritize the provision of constant, timely weather information to farmers and encourage enrollment in agricultural insurance programs to safeguard against crop yield failures and disasters. This holistic strategy aims to create a resilient and thriving agricultural sector while addressing broader socio-economic challenges in the study area.

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Federal Ministry of Education and Research

WASCAL West African Science Service Centre on Climate Change and Adapted Land Use

POLICY BRIEF

ENSURING NIGERIA'S RESILIENCE To Climate Change Induced Land Use Change: ADDRESSING MIGRATION AND FOOD SECURITY

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EXECUTIVE SUMMARY

Examining the North Central Region of Nigeria, this study explores the nexus between climate change, land use changes, and food security. Findings from Niger, Kwara, and Benue states reveal rising temperatures and declining rainfall. Niger witnesses increased agricultural land and urbanization, contrasting Kwara's stability. Shifts in land use trigger significant migration and a notable decrease in food production, challenging Nigeria's pursuit of Sustainable Development Goals. The study utilizes remote sensing, migration data, surveys, and interviews to highlight the critical implications of climate-induced land use changes on the region's agricultural landscape and food security.

INTRODUCTION

Northern Nigeria, historically celebrated for its robust agricultural productivity, now faces the detrimental consequences of climate change and land degradation, evident in prevalent droughts and floods (Dahiru and Tanko, 2018). The reliance on rainfed agriculture and elevated poverty levels have led to reduced crop yields in the region (Dahiru and Tanko, 2018; Okeleye and Olorunfemi, 2016). Climate-induced degradation of agricultural assets is exacerbating this issue, causing a decline in production and severely limiting livelihood opportunities for rural residents (IPCC, 2014). The existing land use system exacerbates challenges, with insufficient availability for those interested in agriculture, necessitating urgent Land Use Act reform for improved access (Kehinde et al., 2021; Okeleye et al., 2016).

Figure 1: Map showing the areas covered by the study

Rural-urban migration, influenced by poverty and food insecurity, is exacerbated by climate change-related risks, including both rapid and slow-onset events (FAO, 2017). Sudden-onset events, such as extreme meteorological events, directly link climate change to migration, displacing rural populations due to damage to assets and production (FAO, 2017; IPCC, 2014). Despite discussions on migration and climate change in Sub-Saharan Africa, the overall implications, particularly in Nigeria, remain inadequately understood (Serdeczny et al., 2017). Researchers, recognizing climate change's significance in migration, highlight the intricate connection between population growth and climate change, emphasizing the role of migration (Stephenson et al., 2010).

Primary determinants of rural migration include low agricultural yield, poverty, and limited access to quality education and healthcare (IOM, 2016). Scholars view migration diversely, as either a climate change adaptation measure or a consequence of inadequate mitigation and adaptation strategies (Davis et al., 2018; Mayer, 2011). This brief distills research findings, aiming to provide evidence-based insights for decision-makers in federal and state ministries, guiding the formulation of policies to enhance Nigeria's resilience against climate change impacts on migration and food security.

RESEARCH APPROACH

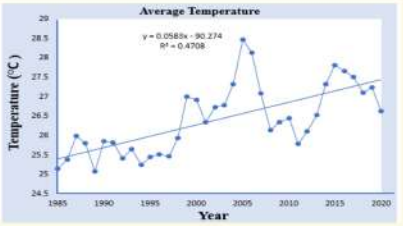
The analysis presented in this brief utilized data sources, including NASA Power Data, multispectral satellite remote sensing, United Nations Net Migration data for Nigeria spanning from 2005 to 2020, crop yield data, expert interviews, focus group discussions, and household surveys through structured questionnaires.

To examine the spatio-temporal changes in climatic parameters (minimum, maximum, and average temperatures, as well as rainfall) from 1985 to 2020, the Mann-Kendal test and non-parametric tests were utilized. Landsat images from 1990, 2000, 2013, and 2020 were employed to extract remote sensing data, enabling the assessment of Land Use and Land Cover (LULC) changes. The relationship between climate parameters and crop yields (maize, yam, cassava, rice, and groundnut) was explored using regression analysis.


Figure 2: Focus group discussion used in the gathering of qualitative insights. Source: Field survey (2021), Okeleye Sunday

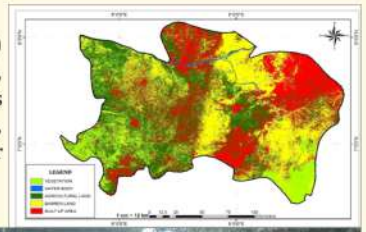
In addition to quantitative methods, qualitative insights were gathered through focus group discussions (Figure 2), expert interviews, and structured questionnaires, all of which were analyzed using descriptive statistics. This comprehensive approach provides a nuance understanding of the complex interplay between climate and land use changes, migration patterns, and food security in the targeted North Central Region of Nigeria.

KEY FINDINGS



1 Reduced rainfall, evident in shrinking rainy seasons at rates of -15.6 mm/year, -0.78 mm/year, and -12.1 mm/year in Niger, Kwara, and Benue States, poses a disaster for farmers, impacting agricultural livelihoods and essential resources due to climate change.

2 Climate and land use changes drive rural-urban migration, impacting crop yields in three states. Young farmers migrate due to altered land use in North Central Nigeria, affecting land cover and contributing to barren land conversion in Kwara and Benue. This has led to a significant and ongoing decline in food production.



3 From 1990 to 2020, Land Use and Land Cover (LULC) results indicate substantial conversion of vegetation, agricultural land, and water bodies in Kwara and Benue States to built-up areas and barren land. Agrochemical usage, including pesticides and herbicides, prompts farmer migration, leaving extensive portions of land uncultivated.

4 Over the past 30 years, Land Use and Land Cover (LULC) changes reflect regional policies and human impacts, increasing built-up areas and decreasing vegetation. This transformation adversely affects food security and ecosystem services due to the conversion of agricultural land to built-up areas. Infrastructure expansion contributes to agricultural land loss.

5 Between 1985 and 2020, the North Central Region of Nigeria witnessed rising temperatures and reduced rainfall. The elevated temperatures, combined with extreme rainfall, pose threats to agriculture, causing issues like soil nutrient leaching, topsoil erosion, and flooding. This climate-induced impact may significantly affect food security and contribute to increased rural-urban migration. Peasant farmers, particularly in states like Niger, Kwara, and Benue, grapple with the yearly challenges brought by climate change, with altered rainfall patterns affecting traditional farming practices.

IMPLICATION OF THE RESULTS

There has been a continuous massive migration of people, particularly young farmers, to cities leaving most of the existing agricultural lands uncultivated. This has been due to the fluctuations in weather pattern, losses in agricultural land and conversion of some of the other LULC classes to barren land. This implies that if this permanent migration remains uncontrolled, it will have significantly negative future impacts on food security of Nigeria.

CONCLUSION

Climate change and frequent land use changes are having huge impacts on migration leading to decrease in food availability, accessibility, affordability and utilization in the Region. Thus, this calls for the enactment, implementation and enforcement of effective policies on climate change, land use, agriculture and rural-urban migration.