



PALM-TREES

A PAN AFRICAN AND TRANSDISCIPLINARY LENS ON THE MARGINS: TACKLING THE RISKS OF EXTREME EVENTS (PALM-TREES)

Building Drought-Resilient Agriculture and Livelihood Systems in Kwara State

POLICY BRIEF

NO. 2, JUNE, 2026, ISSN 0189-4668

EXECUTIVE SUMMARY



Drought represents the most critical climate risk affecting agricultural systems and rural livelihoods in Kwara State. Evidence from the **PALM-TREES** project shows widespread crop losses, declining soil moisture, and increased rainfall variability, all of which undermine food production and income

stability. The predominance of rain-fed agriculture makes rural communities particularly vulnerable to these changes. Despite this, agricultural policies and support systems remain insufficiently adapted to

climate risks, with limited investment in irrigation, climate-smart practices, and drought preparedness. Without urgent investment in irrigation and climate-smart systems, Kwara State risks sustained agricultural decline, increased rural poverty, and rising food insecurity. This policy brief draws on findings from the **PALM-TREES** study and relevant literature to propose a transition toward drought-resilient and climate-smart agricultural systems in Kwara State. This brief recommends a systemic transition to drought-resilient agriculture, anchored on:

- Expansion of irrigation and water management systems
- Scaling climate-smart agriculture practices
- Strengthening extension, finance, and institutional systems
- Promoting livelihood diversification

Immediate, coordinated, and well-financed action is required to safeguard Kwara State's agricultural economy and rural livelihoods.

Methodology

This policy brief is based primarily on findings from the **PALM-TREES** research project conducted in Kwara State, which applied a mixed-methods and transdisciplinary approach to understanding climate risks and vulnerabilities in rural communities. The study combined methods from the physical and social sciences. Physical climate analysis included satellite data (e.g., Sentinel-1, Landsat, MODIS), drought indices (SPI, SPEI, SMI), hydrological data, and climate projections to assess patterns of flood and drought risk. On the social science side, the study engaged over 900 participants across more than 500 communities in 94 wards, using quantitative surveys, focus group discussions, community needs

assessments, and participatory engagement processes. This policy brief draws directly on these empirical findings.



Policy Context

Agriculture in Kwara State is predominantly rain-fed and forms the backbone of rural livelihoods. However, increasing climate variability—particularly in the form of erratic rainfall and prolonged dry spells—has significantly undermined the reliability of this system. National agricultural policies in Nigeria have historically prioritised productivity and food security, with less emphasis on climate resilience and risk management (Federal Ministry of Agriculture and Rural Development [FMARD], 2016). At the state level, agricultural planning remains largely aligned with traditional production models that assume stable climatic conditions. This assumption is increasingly

invalid in the context of climate change, where rainfall and temperature variability is becoming the norm (IPCC, 2022). As a result, farmers are exposed to higher levels of risk, with limited institutional support for adaptation. Irrigation infrastructure in Kwara State is underdeveloped, and access to water for dry-season farming remains limited. Extension services, which are critical for disseminating climate-smart practices, are weak and under-resourced. In addition, access to agricultural finance and insurance is limited, further constraining farmers' ability to invest in adaptive technologies.

The PALM-TREES findings reinforce these structural gaps, showing that agricultural systems in

Kwara State are not adequately equipped to respond to increasing drought risk. To address these challenges, there is a need to reposition agricultural policy toward climate-resilient production systems, integrating water management, technology adoption, and institutional support mechanisms.



Key Issues and Evidence

The PALM-TREES study identifies drought as the most significant climate risk affecting rural communities in Kwara State, with approximately 55% of respondents identifying drought as their primary concern. The impacts of drought are severe and multidimensional. Approximately 83% of respondents reported crop losses, while 63% experienced livestock losses. These losses translate into severe income shocks for rural households and

contribute directly to food price instability and poverty which directly affect household income and food security, contributing to widespread economic instability. The study's climate data analysis shows a long-term increase in agricultural drought, with declining soil moisture levels and prolonged dry periods. This is consistent with national and global climate trends, which indicate increasing drought frequency and intensity across much of sub-Saharan Africa (IPCC, 2022). In addition, the

study highlights limited access to water resources and irrigation systems, which restrict farmers' ability to adapt to rainfall variability. Most farmers rely on rain-fed agriculture, making them highly vulnerable to climate shocks. The evidence also points to gaps in knowledge and capacity. Many farmers lack access to training on climate-smart practices, limiting their ability to adopt adaptive strategies. This is compounded by weak extension services and limited access to financial resources.

Policy Implications

The findings suggest that drought must be reframed from an environmental issue to a core economic and development challenge. Agriculture is a key driver of livelihoods in Kwara

State, and its vulnerability to drought has significant implications for food security, income stability, and poverty reduction.

First, there is a need to transition from rain-fed agriculture to climate-resilient production

systems, including irrigation and water management. This aligns with global best practices, which emphasize the importance of climate-smart agriculture in building resilience (FAO, 2013).

Second, strengthening extension

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services is critical for promoting the adoption of adaptive practices. Farmers require continuous access to information and training to respond effectively to changing climatic conditions.

Third, improving access to finance and insurance will enable farmers to

invest in adaptation and manage risks. Without financial support, many farmers are unable to adopt new technologies or recover from losses.

Fourth, integrating drought resilience into agricultural policy will require coordination across

sectors, including water resources, finance, and rural development.

Finally, there is a need to promote livelihood diversification to reduce dependence on climate-sensitive agriculture.

Priority Policy Recommendations

1. Develop a State Drought Resilience Strategy

a. Establish a Comprehensive Framework for Drought Risk Management

Kwara State should develop a State Drought Resilience Strategy (SDRS) that provides a structured,



long-term approach to managing drought risks across sectors. This strategy should move beyond ad hoc responses and establish a proactive, risk-based framework that integrates early warning, preparedness, mitigation, and recovery. The strategy should be embedded within the state's broader development planning framework to ensure sustainability and policy coherence. The State should undertake drought risk mapping to identify hotspots across LGAs and communities. Based on this analysis, the State can prioritize investments in the most vulnerable areas.

2. Expand Irrigation and Water Management Systems

a. Invest in Small-Scale Irrigation Schemes

Kwara State should prioritize decentralized, small-scale irrigation systems that are accessible to smallholder farmers. These include Tube wells and borehole irrigation, drip and sprinkler systems, and

community-managed irrigation schemes. To address energy constraints, the State should promote solar-powered irrigation systems, which will reduce dependence on diesel and fuel costs and provide reliable and sustainable energy for water pumping

3. Promote Climate-Smart Agriculture

a. Support Adoption of Drought-Tolerant Crop Varieties

The State should promote the use of improved, drought-resistant crop varieties that are better suited to changing climatic conditions. This involves partnering with research institutions and seed companies, subsidizing access to improved seeds, and establishing seed distribution networks.



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Food and Agriculture Organization (FAO). (2013). *Climate-Smart Agriculture Sourcebook*. Rome: FAO.

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World Bank. (2021). *Climate Risk Country Profile: Nigeria*. Washington, DC.

4. Strengthen Agricultural Extension Systems

a. Train Extension Agents on Climate Adaptation

Extension agents should be trained to become climate adaptation advisors, with skills in climate risk interpretation, climate-smart agriculture practices and farmer advisory and communication. The State should increase the number of extension agents, improve mobility (e.g., motorcycles, logistics support) and expand outreach to remote communities. This will ensure that farmers receive timely and relevant advice.

5. Improve Access to Agricultural Finance and Insurance

a. Expand Microfinance and Credit Schemes

The State should facilitate access to affordable credit for farmers by partnering with microfinance institutions, providing credit guarantees, and supporting cooperative-based lending. This will enable farmers to invest in adaptive technologies.

6. Promote Livelihood Diversification

a. Support Non-Farm Income Opportunities

To reduce dependence on climate-sensitive agriculture, the State should promote agro-processing enterprises, rural services (transport, trade) and small-scale manufacturing. The state should provide skills training and support for entrepreneurship

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PALM-TREES is implemented in Nigeria by:

