

BUILDING CLIMATE RESILIENCE IN TANZANIA: INSTITUTIONAL REFORM AND CAPACITY DEVELOPMENT

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EXECUTIVE SUMMARY

Africa is particularly vulnerable to climate change impacts, which will disproportionately affect the continent's small-scale and subsistence farmers. It is thus vital to strengthen institutions to promote alternative agricultural practices and new farming methods. The 2014 AU Strategy on Climate Change views institutional reforms and improved socio-economic development as being crucial in upgrading climate resilience efforts in the agricultural sector. In Tanzania there are numerous impediments to enhancing climate resilience, including the lack of a national climate change policy, limited private sector involvement, inadequate integration of climate change issues into existing sectoral policies, a dearth of linkages between national and sub-national institutions, poor policy implementation, and poor collaboration on climate change resilience efforts. It is necessary to review and assess organisational and institutional arrangements to strengthen the responsiveness of Tanzanian institutions to climate change.

INTRODUCTION

Developing nations are considered to be the most vulnerable to climate change, mainly because they are situated in parts of the globe particularly affected by

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climate change and have low adaptive capacity.¹ This applies to most countries in Africa. The Intergovernmental Panel on Climate Change projects that if greenhouse gas emissions continue to rise, mean global temperatures will have increased by 1.4–5.8°C by the end of the 21st century. This is expected to lead to increased drought and changing rainfall patterns, which in turn will have significant impacts on the production of staple crops.²

Effective responses to climate change require the development of coping mechanisms to enhance resilience at regional, country and community levels. The concept of resilience refers to the ability of systems (including social, economic and ecological systems) to absorb external stresses and recover without compromising their basic functions. Agro-landscapes that have undergone extreme levels of degradation or damage may shift into new steady-state conditions that are significantly less productive and therefore less able to support social, economic and ecological systems. Resilience can be enhanced by implementing appropriate strategies that strengthen the adaptive capacity of states and communities and support more robust and healthy ecosystems.

In many African nations much remains to be done in terms of understanding climate dynamics, managing climate-related risks, and developing sound climate adaptation strategies.³ Limited progress has been made with regard to instituting local- and regional-level climate-related risk management policies, establishing and/or strengthening institutions, and developing infrastructure and capacity in most sub-Saharan African countries.⁴

In Tanzania institutional arrangements and decision-making processes are concentrated at the national level, with relatively little devolution to local and sub-national levels, where the need for climate adaptation is the most acute. The National Strategy for Growth and Reduction of Poverty (NSGRP; also known as the MKUKUTA II strategy in Swahili) outlines a range of policy priorities and programmes aimed at poverty eradication and the promotion of good governance, including effective natural resource governance. However, it is necessary to develop better policy responses to climate change challenges, and to relate these effectively to the broader NSGRP framework.

This paper presents the outcome of research conducted in July 2016 on the institutional and policy frameworks in Tanzania's agricultural sector as these relate to climate change adaptation and resilience. The research included interviews with representatives of national and sub-national government departments, civil society, international organisations and academia.

AGRICULTURE AND CLIMATE CHANGE THREATS IN TANZANIA

Tanzania's mean annual rainfall varies from below 500mm to over 2 500mm, and generally consists of two regimes. Some areas receive bimodal rainfall consisting of long rainfall periods (known as the *Masika* rains) from March to May and short rainfall periods (known as the *Vuli* rains) from October to December. Other areas, especially semi-arid zones, experience a unimodal rainfall pattern, with rain from December to April.⁵

The country faces numerous development challenges, such as infrastructural constraints, low agricultural productivity, a limited fiscal base, a lack of human capital, and environmental and climate-related risks. Approximately 12 million people (out of an approximate population of 47.4 million) live below the poverty line.⁶ Agriculture accounts for 25% of gross domestic product (GDP) and 24% of exports, and provides the livelihoods of more than 80% of the population. Maize is the leading food crop, accounting for 20% of agricultural GDP, followed by rice, cassava, beans, wheat and sorghum. Coffee, cashew nuts, cotton, tobacco, and tea are the most important cash crops produced for export purposes.

Climate change is a major threat to agricultural productivity in Tanzania. Some of the likely effects of climate change include increases in temperature, shifts in rainfall patterns and a general decrease in rainfall, as well as more frequent dry spells and severe droughts. When rains do come, they will be associated with more frequent and extreme flooding. Recent climate-related incidents have underscored the impact that these trends may have on future agricultural productivity and broader socio-economic development. These events include severe droughts in 2004/05, floods in the Kilosa district in 2011, shifts in the Vuli and Masika rainfall seasons, decreases in the flow rate of the Rufiji, Pangani and Ruvu rivers, outbreaks of diseases such as malaria in non-endemic areas, and a loss of 85% of Mount Kilimanjaro's glaciers.⁷

It is predicted that average temperatures in Tanzania will increase to over 30°C by 2050 (from the current highs of 20–24°C), with significant rainfall variation. These and other climate impacts will make large areas of land unsuitable for agricultural production.⁸ It is therefore essential that the country develop effective climate adaptation strategies, particularly in the agricultural sector, from both a livelihoods and a food security perspective.

POLICY GAPS AND INTERVENTION AREAS

Tanzania's National Environmental Action Plan (NEAP) highlights inadequate human resources and poor institutional capacity as major constraints to climate change adaptation and mitigation efforts in the country. The NEAP also points to a problematic lack of climate policies and institutional frameworks at national and regional levels.⁹ The National Climate Change Strategy, published in 2012, emphasises the need to develop tools and mechanisms that can foster sustainable use of natural resources, and support climate adaptation and resilience efforts.¹⁰ Institutional constraints to effective policy implementation are also highlighted in Tanzania's Development Vision 2025 and the country's Development Plan 2011/12–2015/16.

To further climate resilience efforts, the Tanzanian Agriculture Climate Resilience Plan (ACRP) 2014–2019 was developed by the Ministry of Agriculture, Food Security and Cooperatives. The main objective of this plan is to strengthen responsiveness to climate change impacts in the agricultural sector. It has been created to mainstream climate change in the context of existing policies, plans and practices while guiding urgent adaptation and mitigation interventions and investment opportunities. Mainstreaming is the process of integrating

considerations of climate change adaptation into policymaking, budgeting, implementation and monitoring processes at national, sectoral and sub-national levels. The effective implementation of the ACRP will allow for an integrated approach to enhancing resilience and promoting development.

In the context of climate change, the need for data on climate and other environmental factors in Africa is greater than ever. There are increasing efforts to provide scientific, long-term, well-distributed information, data and software that are easily and freely accessible to practitioners and researchers. The Tanzania Meteorological Agency (TMA) is mandated to provide meteorological services on behalf of the Tanzanian government. Its function is to collect, archive and disseminate meteorological data, and provide weather and climate services and disaster preparedness information for public consumption. While the TMA does provide 10-day weather forecasts, the data is presented in a technical manner that local farmers struggle to access and interpret, with the result that most farmers rely on indigenous knowledge of weather patterns. Weather-related data should be made more accessible to local farmers, for example by presenting it in a manner that is easier to interpret and making information available in a range of local languages.

While good data is a prerequisite for sound decision-making, climate change analysis at the TMA is not well developed. Inadequate climate monitoring facilities and human resource deficits limit the agency's capacity to provide analysis that supports targeted climate action. Weather and climate data is produced at a national scale and lacks localised specificity, which constrains efforts to downscale global climate models from a statistical point of view. There is a need for better region-specific models and strategies for changing environmental conditions in the country. More work and capacity building is required, particularly in the area of medium- and long-range climate forecasting. If Tanzania's response to climate change is to be improved, the number of trained and experienced climate change scientists able to conduct climate change analysis should be increased. More resources should also be allocated to improving meteorological and climate analysis infrastructure. Tanzania's network of weather monitoring stations (currently 26) should be strengthened and expanded.

Computer modelling facilities and meteorological expertise is generally concentrated in Dar es Salaam. Decentralisation to sub-national, region-specific facilities will allow experts to meet farmers' needs at both district and local levels. Early warning services are a prerequisite to support farmers in the efficient management of disaster-related risks. The TMA should consider designing a framework for information dissemination from its head office in Dar es Salaam to sub-national levels.

Most information and knowledge sharing on climate change is retained at the national level, rather than being effectively disseminated to the district and village level. Interviews with stakeholders from regional institutions indicated that most farmers are not aware of the climate change policies, strategies and plans in place to address climate adaptation needs. The disconnect between policy and practice also occurs in the relationship between district-level experts or administrators and local farmers. A study carried out in the Morogoro region showed that farmers who worked with meteorologists in participatory workshops were better able

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to use seasonal weather forecasts to guide their farming practices than farmers who only received that information through radio broadcasts.¹¹ Farmers who had received targeted training also maintained higher yields during seasonal bad weather. Institutions are important channels for facilitating farmers' access to resources and opportunities. Improving farmers' understanding of climatic impacts through education will help them to adopt innovative practices and make informed decisions. Limited access to information is thus a major constraint to adaptation.¹²

The government is the main provider of agricultural extension services in the country, although several non-governmental organisations and farmer-led initiatives do supplement these services. The 1970s decentralisation policy during the tenure of president Julius Nyerere increased extension services for smallholder farmers by shifting planning to local governmental authorities. The introduction of structural adjustment programmes in the 1980s interfered with this, as the Ministry of Agriculture and Livestock was pressured into retrenching large numbers of agricultural extension officers. To an extent the consequences of this process are still being felt, as the implementation of agricultural plans and programmes at the district level remains constrained by limited human resources and inadequate operational budget allocations.¹³ There is a clear need to involve local governance structures more in policy formulation and implementation.

In addition, the capacity of the Ministry of Agriculture to formulate and effectively implement policies and respond to commitments such as those made through the Comprehensive Africa Agriculture Development Programme is of significant concern. If policies governing adaptation were to be integrated, they would provide much-needed guidelines for the institutions implementing climate change programmes. This would also support coordinated and adequate budgetary allocations to implement the required response across a range of government departments and administrative levels. Although agriculture is one of the sectors most affected by climate change in Tanzania, the government has a limited budget for climate-related disaster risk preparedness, with the largest proportion of funding coming from donor-supported programmes.

More than 80% of farmers in the country are subsistence farmers who depend solely on small-scale farming for their livelihoods, with limited adaptive capacity to respond effectively to climate change. Most of them also lack the necessary access to financial resources to respond to climate-related risks, including floods and droughts.

Innovative agricultural interventions, particularly new technologies and agricultural practices, are required to increase crop yields and improve water use efficiency, which in turn could have a significant impact on small-scale farmers' livelihoods. It is important to explore and promote the adoption of innovations such as drought-resistant crops, early maturity cultivars, rainwater harvesting and conservation agriculture. While there is some evidence of such practices being adopted in the country, these efforts require significant scaling-up. Building communities' capacity for innovation and adaptation is a crucial part of upgrading farming practices.

The MKUKUTA strategy emphasises engagement with the private sector to promote a competitive and vibrant government. The 2010 Agriculture, Commercial, Legal and Institutional Reforms Report, which assessed conditions and opportunities

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for business in Tanzania's agricultural sector, highlights the significance of private sector engagement in climate resilience efforts.¹⁴ Support for public-private partnership initiatives and other civil society climate-related efforts should be strengthened to increase responses to climate change, for example in areas such as crop insurance against climate-related risks. In the Morogoro region, for instance, the introduction of the Private Agricultural Sector Support Programme and the Participatory Agricultural Development Programme has promoted the increased use of adaptation strategies at the local level. The private sector also has an important role to play in providing access to credit facilities, which are crucial in supporting farmers' investments in new crop varieties, irrigation systems and other tools and technologies that would support more climate-resilient agricultural practices.

Effective climate adaptation and enhanced resilience require a region-specific focus. Local climate change adaptation responses, and therefore also the technical and policy support to facilitate such adaptation, will differ between contexts depending on soil type, climate, crop/livestock utilisation and other variations. It is therefore essential that agricultural experts and policymakers understand the adaptation needs of agricultural communities at district and even village levels. Practices and policies suited to semi-arid areas such as the Mvomero district would differ significantly from practices appropriate for the Morogoro district, despite the two being located in the same region.

CONCLUSION

Sub-Saharan African countries are among the most vulnerable to climate change impacts. Tanzania's 2006 National Adaptation Programme of Action report highlights the threats climate change poses to the country's agrarian population, who are largely dependent on rain-fed agriculture for their daily subsistence. If the effects of climate change are not well managed they will have significantly adverse effects on local livelihoods, agricultural production and the country's overall economic growth and development.

Extreme weather events and other climate-related impacts are already affecting agricultural production in Tanzania. Numerous institutional gaps are evident, including the lack of a clearly articulated national climate change policy and region-specific climate change strategies. Data validation and accessibility require urgent attention in order to support an effective climate response. In addition, most institutions are constrained by inadequate financial budgeting, limited technical expertise and a lack of access to climate information and knowledge.

The need for institutional reforms to facilitate climate change resilience efforts is more urgent than ever in Tanzania. National and sub-national climate models must be developed, and the reinforcement of early warning, risk and disaster management measures must be supported. In addition, the TMA should look at effective ways to bridge the gap between climate science and policy to enhance responsiveness to climate change at regional and local scales.

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