

Climate Change Adaptation and Sustainable Land Management in Sub-Saharan Africa*

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ABSTRACT

Empirical evidence has shown that farmers can adapt to climate change by using sustainable land and water management (SLWM) practices that provide local mitigation benefits. Still, adaptation to climate change using SLWM practices in sub-Saharan Africa (SSA) remains low. This paper presents a study that was conducted in four African countries to examine the impact of government policies on adaptation to climate change. The need for global and regional level partnerships is discussed. In the selected four African countries agriculture is a major sector, contributing at least 24 percent of the GDP. Niger which has spent the largest share of government budget on agriculture, is the only country among the four whose agricultural expenditure as percent of the total government expenditure exceeded the Maputo Declaration target of 10 percent. Both policies and economic development have shaped how each adapt to climate change and each of the four case study countries offers success stories that enhance adaptation strategies. The scaling up of success stories requires public investment to raise awareness and provide the technological support required for often knowledge-intensive practices. The relative success of Kenya in promoting soil conservation and fertility measures suggests that large-scale extension programs can be effective but that they require long-term commitment, something that is absent in the common practice of project funding. Lack of coordination and partnership across development organizations, NGOs, research organizations, government ministries, and stakeholders impedes critical knowledge and information sharing needed for the effective development and implementation of innovative SLWM practices.

INTRODUCTION

Empirical evidence has shown that farmers can adapt to climate change by using sustainable land and water management (SLWM) practices that provide local mitigation benefits, reducing or offsetting the negative effects of climate change at the level of the plot, farm, or even landscape (Smith et al. 2008; Cooper et al. 2009; Cooper and Coe 2011). However, adaptation to climate change using SLWM practices in sub-Saharan Africa (SSA) remains low (Nkonya et al. 2011a). This study was conducted to examine the impact of government policies on adaptation to climate change. A discussion of global and regional level partnerships highlights the need to evaluate the potential of current trends and initiatives within the SLWM landscape to have a direct impact on the success and scaling-up of government policies and programs.

METHODS

Kenya and Uganda in East Africa and Niger and Nigeria in West Africa were used as case studies. The selection ensured that the transboundary sites had comparable biophysical and livelihood

characteristics and that the major difference between the sites across the border was the policies in each subregion. The study used a variety of data sources, including: satellite imagery data to determine changes in land use and cover, and the carbon density of the different types of land use and cover; focus group discussions to obtain community perceptions on biophysical and socioeconomic changes, the timeline of their occurrence, their drivers and impacts, and community responses to these changes; and household- and plot-level survey data to understand the determinants of adaptation to climate change and the impacts of SLWM practices on agricultural productivity. These combined methods were used to determine how land users have responded to climate change and the impacts of their responses on agricultural productivity, climate-related risks, and carbon stock.

RESULTS

The four selected countries have policies and economic development that have shaped how each adapt to climate change. Agriculture is a major sector in all four countries, contributing at least 24 percent of the GDP (Figure 1). This means, expenditure in the agricultural sector is likely to have favorable impact on economic growth and adoption of SLWM and adaptation to



climate change. Niger, which has spent the largest share of government budget on agriculture, is the only country among the four whose agricultural expenditure as percent of the total government expenditure exceeded the Maputo Declaration target of 10 percent (Nkonya et al. 2011a).

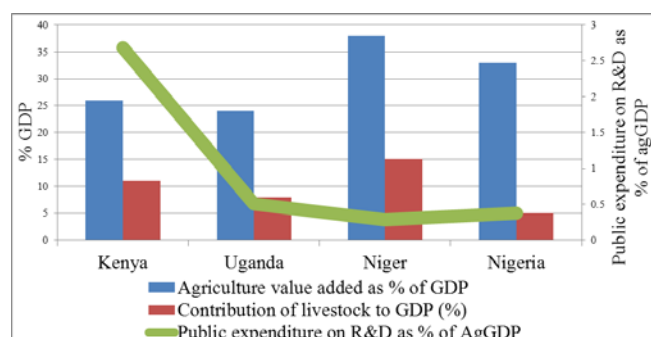


Figure 1. Economic development and agricultural policies across the four case study countries.

The differing climate change patterns and the different agroecological and socioeconomic environments of each of the four case study countries has equally influenced the design of various strategies to cope with and adapt to climate change (Tables 1 and 2). Each of the four case study countries offers success stories that enhance adaptation strategies. While Kenya's policies have strongly supported agricultural research and development as well as an agricultural market environment that has offered incentives to farmers to adopt SLWM, neighboring Uganda has implemented government decentralization and a land tenure system, both of which have contributed to the rise of stronger local institutions that offer opportunities for improved community resource management. In West Africa, Nigeria has long supported irrigation development and recently focused on small-scale irrigation that has increased agricultural production and reduced production risks in the drier, northern states. Even though such irrigation programs were not implemented as part of adaptation to climate change, they have helped farmers to adapt well to climate change. Niger also offers a good example of tree planting and protection, which was successful due to the Rural Code, which gave land users rights to own benefit from trees on their farms and thereby contributed to the greening of the Sahel. Hence, in all the countries we see the influence of policies on the adoption of SLWM and response to climate change in general, policies that show promise for scaling up.

Table 1. Selected policies by country.

	Kenya	Uganda	Niger	Nigeria
Reforestation programs/tree planting	+++	++	+++	+
Fertilizer programs	++			+++
Agricultural R&D	+++	+	+	++
Irrigation	+++		+	+++
Land tenure	++	+++	+	+
National action plan for adaptation		+++	+++	
National action plan	+++	+++	+++	+++

Table 2. Adaptation methods by country.

Adaptation strategy	Nigeria	Niger	Uganda	Kenya
Irrigation	+++	+		++
Water harvesting		++	++	++
New crops	+++			+++
Change sowing date	+++	+++		++
New varieties	+++			+++
Mulching			+++	+
Planting trees			+++	++
Fertilizer	+++			+++
livestock production	++	--	--	--
Controlled grazing	+	+	+++	+

DISCUSSION AND CONCLUSION

Scaling up these success stories requires public investment to raise awareness and provide the technological support required for these often knowledge-intensive practices. The relative success of Kenya in promoting soil conservation and fertility measures suggests that large-scale extension programs can be effective but that they require long-term commitment, something that is absent in the common practice of project funding (Nkonya et al. 2011a). The long-term extension project in Kenya was also supported by a large number of nongovernmental organizations (NGOs) active in land management. These organizations not only complement an extension program but inject a degree of innovation that can lead to the generation of improved SLWM practices.

Moreover, facilitating the linkages among all development organizations, and with research organizations, would serve to enhance the scaling up process. Lack of coordination and partnership across development organizations, NGOs, research organizations, government ministries, and stakeholders impedes critical knowledge and information sharing needed for the effective development and implementation of innovative SLWM practices. Partnerships among land and water users, technical experts, policymakers, and donors and investors are important to ensure that policies and practices developed for the sustainable management of land and water use are not only appropriate and context-specific, but are also fully supported by land and water users at the local, community and regional level. In regions most affected by climate change, land degradation, and water scarcity, micro-to-global level partnerships will play an increasingly important role in the scaling up of SLWM practices, especially given the predominance of land fragmentation and communal property ownership in many of these areas.

Partnerships at the country level that connect key decision-makers with community members, local institutions, and stakeholders from the grassroots level serve to raise awareness, build interest and trust, and ensure support and acceptability of SLWM practices among those who are typically most vulnerable to land degradation and the negative effects of climate change. As a result, country level partnerships that engage stakeholders in decision making processes have the potential to reduce transaction costs, facilitate knowledge sharing, build capacities at the

community level, and generate greater coherence across national level SLWM policies and programs (ILC 2011).

While securing engagement with and support from the grassroots and community level is a key building block to the success of offsetting the negative effects of climate change and implementing long-term SLWM practices, the successful scaling up of such initiatives requires a more global focus on partnerships. Though land and water use occurs in local places, it has the potential to contribute to ecological degradation and resource scarcity on a local, regional, and even global scale (Foley et al. 2005). Furthermore, increased competition over natural resources, resulting from mounting population pressures, the negatives effects of climate change and economic growth, has contributed to outcomes that transcend national boundaries, including growing international investments in land resources by both the public and the private sector. Developments of this kind and on this scale reinforce the need to adopt a global, collaborative approach for mobilizing efforts that will reduce land degradation and have a significant impact on the food and water insecure populations in developing countries (Nkonya et al. 2011b).

The need for working together on issues related to land management has been gaining momentum. One of the most well-known international cooperation initiatives on land and water resource management is the United Nations Convention to Combat Desertification (UNCCD). The Convention actively supports the development of National Action Plans by coordinating collaboration between donors and recipient countries. Through this role, the UNCCD has been instrumental in raising awareness on sustainable land management, building political momentum, developing frameworks for combating desertification, strengthening multi-stakeholder partnerships, and building capacities for community-based planning. Other examples of international level initiatives are the Global Water Partnership (GWP) and the International Land Coalition (ILC). The GWP advises on and assists with the coordinated development and management of natural resources; in this role the GWP has contributed to the establishment of legislature in favor of integrated water resource management. The ILC is a global policy-advocacy alliance of 81 civil society and intergovernmental organizations in 40 countries that work together to support agrarian and land reforms that benefit the poor. While considered successful global initiatives, these partnerships and coalitions all face similar obstacles in terms of generating sufficient funding, securing political support, and building effective coordination mechanisms (Nkonya et al. 2012).

At the regional level, specifically in this study's focus area, a number of initiatives have come into existence over the past several years. Two examples include TerrAfrica and the Partnership for Agricultural Water Management in Africa (AgWA). The TerrAfrica initiative was born out of a series of consultations between the New Partnership for Africa's Development (NEPAD), African countries, and various regional and international agencies that sought a new approach to address the previously unsuccessful efforts to tackle the high levels of land and soil degradation in sub-Saharan Africa. TerrAfrica is a partnership of African governments, NEPAD, regional and sub-regional programs, UNCCD, the African Development Bank, the World Bank, and other donors, which coordinates support for



Figure 2. Potential partner types.

SLWM policies, programs, and practices. AgWA is a similar partnership, consisting of African governments, donors, and international and national organizations from the public sector and civil society, which focusses on improving agricultural productivity through better access to and use of water. To achieve this, AgWA provides a platform for sharing knowledge and fostering synergies between agricultural water management investors and professionals from a diverse range of organizations (Nkonya et al. 2012).

Along with increasing evidence of the need to seek global level partnerships, more than ever there is a necessity to engage in so-called “smart partnerships” along impact pathways, where partners are carefully selected to achieve impact along the research to development pathway. The new global research programs, which are led by IFPRI on Policies and Institutions as well as Health and Nutrition, are examples of a new way of doing things. Partnerships are established all the way from the conceptualization of an idea to the implementation of research results. Figure 2 demonstrates the types of partners that emerge when applying this impact pathway partnership approach to the field of sustainable land and water management. It is evident from this figure that partnerships take place in a variety of spheres, ranging from the political to the scientific.

The relatively recent proliferation of international and regional partnerships for sustainable land and water management highlights the need to take a closer look at the typology of initiatives that influence the current SLWM landscape at the regional and global level and to better understand how these initiatives can have a direct impact on government policies that promote SLWM and adaptation to climate change. This study makes clear that some SLWM practices may require special attention. Specifically, irrigation is touted as an essential ingredient for increased productivity and for climate change adaptation in Africa by numerous organizations, including NEPAD. Irrigation faces many of the same challenges as other SLWM practices but also brings in the element of the need for capital investment (in water storage or distribution) and more effective adaptation to climate change. Merging the findings from this study with a more thorough examination of the impact of SLWM-oriented partnerships could direct further research toward best practices for sustainably managing natural resources, improving agricultural productivity, and enhancing the well-being of the poor.

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