



# SUSTAINABLE LAND MANAGEMENT IN AFRICA

## OPPORTUNITIES FOR CLIMATE CHANGE ADAPTATION

*Bali Action Plan, 2007, Decision 1(c)(i)/CP.13: Enhanced action on adaptation, including, inter alia, consideration of: International cooperation to support urgent implementation of adaptation actions, ... to enable climate-resilient development and reduce vulnerability of all Parties, taking into account the urgent and immediate needs of developing countries that are particularly vulnerable to the adverse effects of climate change, especially the least developed countries and small island developing States, and further taking into account the needs of countries in Africa affected by drought, desertification and floods.*

## Climate change is a threat to livelihood security in Africa

Climate change will exacerbate existing vulnerabilities to land degradation, floods and drought in Africa and will challenge farmers to make major changes in farming systems.



A third of the people in Africa already live in areas prone to droughts facing severe risks of food insecurity and famines.<sup>1</sup> Droughts will become more frequent, making dryland food production even more difficult.



With temperature changes, the growing season for crops may shrink by more than 20% in several countries in the continent. Crop yields may decline by 50% in some countries by 2020.<sup>1</sup>



Ecosystems and biodiversity will be at risk. Over 4000 African plant species will lose critical habitat, undermining the livelihoods of many Africans who depend on wild species for food, fuel, fodder and medicines.<sup>1</sup>

## Adaptation through Sustainable Land Management (SLM)

Sustainable Land Management (SLM) strategies and practices enable farmers and communities to adapt, as well as become more resilient, to climate change by increasing food production, conserving soil and water, enhancing food security and restoring productive natural resources.

### SLM diversifies food sources and livelihood options

Agroforestry is an SLM practice that incorporates trees and shrubs in croplands and pastures. These farm trees can moderate field temperatures, serve as wind-breaks and improve water infiltration. They also produce wood, fruits, fodder and medicines, which diversify food and income sources for crop and livestock producers. With climate-induced uncertainties, such diversified production systems enhance livelihood security and resilience.



The national average use of inorganic fertilizer in Malawi is only 27 kg of nitrogen per hectare.<sup>2</sup> By intercropping maize with *Gliricidia sepium*, a nitrogen-fixing tree, farmers in Malawi have increased average yields nearly 4-fold, at a minimal cash cost. Providing the equivalent amount of nitrogen through inorganic fertilizers to farmers of Malawi for half of their land annually would cost \$11.6 million.<sup>3</sup>

### SLM conserves soil and water

SLM strategies help farmers to reduce soil erosion and retain more water in their farm fields and grazing lands. Retaining crop residues, minimizing tillage and using rotations and mixed cropping improve soil fertility and water infiltration. Earth catchments and tied ridges trap rainwater and erosive runoff in the fields, improving soil and soil biological activity.

Such practices protect soils, improve fertility, conserve water, increase crop yields, and reduce yield variability.



Farmers in Zambia using conservation farming methods in 125 farms increased maize yields by 50% (1.5 tons) per hectare, and cotton yields by 39% (0.45 tons) per hectare compared to traditional ox-plow tilling, while protecting soil and water.<sup>4</sup>



The average length of crop growing period in semi-arid Kenya is predicted to shrink to 101 days from 110 days under an average climate change scenario. However, by applying maize residue mulch, the growing period can be extended to 113 days with a positive impact on yields.<sup>5</sup>

## SLM adapts livestock grazing to the changing climate

Livestock husbandry plays a central role in food security in Africa, for smallholder farmers, dairy producers and pastoralists. Yet drier and more erratic weather conditions will reduce the availability of feed. SLM can offset this with rotational grazing in rangelands, fodder trees planted in farms and community land, and community grazing reserves. Moreover, healthy pastures and rangelands with permanent vegetation cover protect critical watersheds and water sources.



Communities in Tanzania have planted 350,000 hectares of degraded land with exotic and native trees that produce livestock fodder, while re-vegetating critical watershed areas to safeguard hydrological functions and soil fertility. Most of the residents in 833 villages received an average benefit of US\$ 1191 per household from the products of re-vegetation, including timber, fuel wood and carpentry.<sup>6</sup>

## Expanding SLM's role in climate change adaptation

To realize the great potential for using SLM to adapt to climate change, policymakers can:

**1**

**Scale up investments that address land management and climate risk by building on existing policy frameworks and platforms.** TerrAfrica is a multi-stakeholder platform that is working to upscale and align SLM related investment in Africa. The platform supports implementation of Sub-Saharan countries' UNCCD National Action Programs, and NEPAD's Comprehensive Africa Agriculture Development Program (CAADP) to improve food security and productivity. TerrAfrica provides knowledge-sharing, coalition-building and coordination of country-based investments across sectors. These and other existing policy frameworks and institutions can be used as entry points for climate change adaptation that also benefits rural livelihoods.

**2**

**Strengthen awareness and access to UNFCCC and other funding resources for climate adaptation related to agriculture and land use.** Climate change funds can be blended with other financial resources to reduce project development costs and enhance local revenues, with adequate technical support and capacity development.

**3**

**Support local, national and regional African farmer organizations to mobilize grassroots movements for adoption of SLM to respond to climate change.** Adaptation to climate change requires farmers and communities to adjust land management over time and space. Understanding local-level concerns and empowering local action is essential to build resilience to climate change. Efforts are underway in a number of African countries to link producers, extension, line ministries, finance, planning, and civil society around one shared policy and investment dialogue on how to best scale up SLM.

For more information on the TerrAfrica platform, please visit: [www.terrafrica.org](http://www.terrafrica.org).

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Sources: 1. Boko *et al.* 2007; 2. World Agroforestry Centre 2009; 3. Pye-Smith 2008; 4. Haggblade & Tembo 2003; 5. Pender *et al.* 2009; 6. World Resources Institute 2005.

For full references, please visit: [www.ecoagriculture.org/publications.php](http://www.ecoagriculture.org/publications.php).

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