

Land & Climate

The Role of Sustainable Land Management
for Climate Change Adaptation
and Mitigation in Sub-Saharan Africa

E X E C U T I V E S U M M A R Y



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P R E F A C E

Climate change and land degradation are major threats to the survival and livelihoods of millions of people in Sub-Saharan Africa (SSA). Major new opportunities exist to help improve the livelihoods of African smallholder farmers, pastoralists, and other resource users while mitigating emissions of greenhouse gases, reducing land degradation, and addressing other environmental problems in the context of the current negotiations to develop a post-Kyoto climate change framework, and international, national, and local efforts to promote sustainable land management (SLM) and conserve biodiversity.

This issue paper is an executive summary of a larger document with the same title. It seeks to help address these threats and achieve the potential of these opportunities by informing policy makers, development practitioners, and others concerned about these issues about the linkages between climate change and SLM, the opportunities and constraints to promoting climate change mitigation and adaptation through SLM, and the policy and institutional options to overcome the constraints and realize the opportunities that are now or are becoming available.

A C K N O W L E D G M E N T S

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Coping with climate variability is a major challenge for the people of Sub-Saharan Africa (SSA).

The high dependence of the economies and rural people of SSA upon rainfed agriculture, the prevalence of poverty and food insecurity, and limited development of institutional and infrastructural capacities in this region make coping with natural climate variability a perennial challenge. In the past several decades, the number of extreme weather events in particular sub-regions and the number of people affected by droughts and floods have grown dramatically.

This challenge is being magnified by global climate change in most of SSA.

Many climate models predict negative impacts of climate change on agricultural production and food security in large parts of SSA. Higher temperatures throughout all of SSA will cause shorter growing periods, drying of the soil, increased pest and disease pressure, and shifts in suitable areas for growing crops and livestock. Mean rainfall is predicted by most models to decline in many areas of SSA, especially in southern Africa, while rainfall is more likely to increase in parts of eastern and central Africa and predictions are more variable in western Africa. Beyond the impacts on mean trends, climate change is expected to cause more extreme weather events. Even in many areas where rainfall is expected to increase, higher temperatures will reduce growing periods. These changes are predicted to reduce the area of land suitable for rainfed agriculture by 6 percent (averaged across several projections), and reduce total agricultural GDP in Africa by 2 to 9 percent. Agricultural losses are expected to be as much as 50 percent in southern Africa during drought years¹.

These problems can exacerbate and be exacerbated by land degradation.

Severe land degradation – caused mainly by conversion of forests, woodlands and bush lands to agriculture, overgrazing of rangelands, unsustainable agricultural practices on croplands, and excessive exploitation of natural habitats – is reducing primary productivity on as much as 20 percent of the land in SSA, with the most severe impacts in drylands and forest margins. Climate variability and change can contribute to land degradation by exposing unprotected soil to more extreme conditions and straining the capacity of existing land management practices to maintain resource quality, contributing to de-vegetation, soil erosion, depletion of organic matter and other forms of degradation. These changes can cause land management practices that were sustainable under other climate conditions to become unsustainable, and induce more rapid conversion of forest or rangeland to unsustainable agricultural uses. At the same time, land degradation increases the vulnerability of agricultural production and rural people to extreme weather events and climate change, as the fertility and buffering capacities of the land and livelihood assets are depleted.



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**Land degradation is not an inevitable result of climate variability and change, however.
Much depends upon how land resource users respond to climate changes.**

Climate change can offer new opportunities for productive and sustainable land management (SLM) practices, such as reforestation, improved water management, integrated soil fertility management, conservation agriculture, agroforestry, improved rangeland management and others as a result of changing biophysical or market conditions.

New opportunities for SLM are arising from regulations and emerging markets to mitigate global emissions of greenhouse gases (GHG).

Agriculture, forestry and land use (AFOLU) practices in SSA can play an important role in mitigating GHG emissions by reducing agricultural emissions of GHG and sequestering carbon in vegetation, litter and soils. The Intergovernmental Panel on Climate Change (IPCC) estimates that improved agricultural and land management practices in SSA, including improved cropland and grazing land management, restoration of peaty soils, restoration of degraded land and other practices, could reduce GHG emissions by 265 Mt CO₂e per year by 2030 (at opportunity costs of up to \$20 per tCO₂e). Afforestation in Africa could sequester 665 Mt CO₂ per year, while reduced deforestation and forest degradation (REDD) in Africa could reduce emissions by 1,260 Mt CO₂e in 2030 (at opportunity costs of up to \$100 per tCO₂). These potential emission reductions in Africa represent about 6.5 percent of global GHG emissions in 2000; a substantial potential impact even if it would not solve the climate problem by itself. **If payments for these carbon mitigation services were available, this could also provide large flows of funds (more than \$10 billion per year if only half of the potential reductions were achieved) to help promote SLM activities in Africa.**



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SLM can also reduce vulnerability and help people adapt to climate variability and change.

For example, farmers in the Ethiopian highlands report investing in soil and water conservation measures as their most common response to declining rainfall. Many SLM practices can simultaneously achieve both adaptation and mitigation goals, especially those that increase soil organic carbon. SLM represents a preventative approach to climate change that can reduce the need for costly *ex post* coping measures, like changing crops and livelihoods, clearing new lands for agriculture and migration. The predicted negative yield impacts of climate change are often dwarfed by proven positive yield impacts of improved land management. In addition to positive impacts on average yields, many SLM practices reduce the variability of agricultural production (for example, soil and water conservation and organic practices that improve soil moisture holding capacity or integrated pest management practices that reduce vulnerability to pests), while others can help to diversify agricultural income (for example, agroforestry with non-timber tree products or crop rotations). A combination of SLM practices can be used to combat the different manifestations of climate change.

Despite the large potential for SLM to contribute to climate change mitigation and adaptation in SSA, little of this potential is currently being realized.

SLM practices are adopted on only a small percentage of agricultural land in SSA. Degradation of agricultural land and expansion of agriculture into forests, woodlands and bush land are continuing at a rapid pace.



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There are many policy frameworks, strategies, institutions, and programs to promote climate mitigation and adaptation through SLM in SSA, but the impacts of these are so far quite limited.

Among the potentially most important mechanisms are the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC), the voluntary carbon market, various climate mitigation and adaptation funds, the United Nations Convention to Combat Desertification (UNCCD), the Comprehensive African Agricultural Development Program (CAADP) of the New Partnership for Africa's Development (NEPAD), TerrAfrica, and regional, sub-regional and national policy processes linked to these. Current use of these mechanisms is very limited:

- Among AFOLU measures, the CDM allows only afforestation and reforestation (A/R) projects, but only 10 A/R projects in SSA are in the CDM pipeline.
- No offsets are supplied to the Chicago Climate Exchange (CCX) by SLM projects in SSA, and only about 0.2 MtCO₂e were offset through other voluntary transactions involving land management in SSA in 2007.
- Many carbon mitigation funds have been established, but most do not support AFOLU activities in SSA.
- National Adaptation Programmes of Action (NAPAs) have been developed by most African countries, but implementation has been limited by funding and other constraints. Several adaptation funds have been established, but they are small compared to the total need, and access to these funds in SSA has been very limited so far.
- Implementation of National Action Programmes of the UNCCD has also been limited by funding constraints and other factors.

NEPAD's CAADP and TerrAfrica are working in partnership to promote upscaling of SLM in Africa, with increasing focus on climate change mitigation and adaption.

TerrAfrica has mobilized \$150 million in funds that are expected to leverage an additional \$1 billion to support this goal. CAADP and TerrAfrica are working with African governments to develop and support Country Strategic Investment Frameworks (CSIFs) for SLM. Integrating strategies and programs to promote SLM and address climate change with each other and with national development strategies and policies is a major challenge. Addressing this challenge is a major emphasis of the CSIFs.



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There are opportunities to promote climate change mitigation and adaptation through SLM in SSA through existing mechanisms.

In the present context, the opportunities include increased use of the CDM to finance A/R projects; increased use of voluntary carbon markets and carbon mitigation funds to test and demonstrate methodologies for a wider range of AFOLU activities; increased use of adaptation funds to support SLM activities prioritized by African governments; increased funding for climate change mitigation and adaptation through programs promoting SLM in Africa; and increased integration of climate change mitigation and adaptation activities, including SLM, into development strategies of African governments and donors.

Many challenges and constraints may prevent realization of these opportunities.

The main constraints to expanded use of the CDM to support SLM in the present framework include CDM eligibility restrictions; high transactions costs of registering and certifying CDM projects; low prices for certified emissions reductions (CERs), especially for A/R projects; long time lags in achieving CERs; uncertainty about the benefits of projects and the future of the CDM; and land tenure insecurity in many African contexts. These constraints are exacerbated by the limited technical, financial and organizational capacities of key actors in SSA. Many of the same constraints apply to supporting AFOLU investments through voluntary and other compliance carbon markets, although to a lesser degree in some cases. Constraints to increased use of adaptation funds to support SLM activities for climate adaptation include the limited size of these funds; lack of coordination among key government ministries; lack of technical and human capacity to implement adaptation activities; and others.



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Major new opportunities may arise as a result of development of a cap and trade system in the United States and inclusion of REDD and a broader set of AFOLU activities in the post Kyoto climate framework.

Prospects for a U.S. cap and trade system have substantially improved as a result of the election of 2008, although passage of such a system or U.S. ratification of a post Kyoto treaty is by no means assured. The 2007 Bali Plan of Action of the UNFCCC urges consideration of REDD payments in the post-Kyoto framework, and many proposals for such schemes have been tabled by Parties to the convention and others. Proposals for expanding the eligible AFOLU activities in the post-Kyoto framework are also being suggested, although the UNFCCC has not taken a formal decision to consider those.

There are many uncertainties, challenges, and constraints to realizing these new opportunities as well.

Challenges to a broad based participation in the global carbon market include the political challenge of achieving ratification of a post-Kyoto treaty; concerns about the effectiveness and risks of emissions reductions purchased from developing countries; and possible opposition by U.S. lobby groups to offset payments to foreign land users. Challenges to REDD payments include the technical difficulties and costs of defining baselines and assuring additionality; concerns about leakages; potential adverse incentives caused by such payments; concerns about the fairness of paying countries with a poor record of protecting forests and not paying those that have protected their forests; possible negative impacts on poor people, especially where they have insecure land and forest tenure; and concerns about flooding the carbon market with cheap offsets. Many of the same challenges will affect payments for AFOLU activities. Many of these concerns are likely to be less problematic than for REDD payments, except the size of transaction costs relative to the value of payments per hectare. Given the low payments per hectare possible for many AFOLU activities, projects will need to focus on promoting profitable AFOLU activities by addressing other constraints to adoption, such as lack of technical, financial and organizational capacities.



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Based on this review, eight options can help take advantage of the opportunities and overcome the constraints to increased use of SLM in SSA to mitigate and adapt to climate change:

- 1. Advocate improvements in the post-Kyoto agreement that address these opportunities and constraints, including:**
 - **Expanding eligibility in the CDM** to include all activities that sequester carbon or reduce emissions of GHGs, including REDD and AFOLU activities;
 - **Agreeing to national targets for GHG levels of developing countries, and use a full GHG national accounting approach** to credit reductions relative to baselines (approach could be pilot tested in a few countries and for a specific set of activities first); and
 - **Increasing funding for adaptation measures.**
- 2. Simplify and improve the procedures to access funds under the CDM, adaptation funds and other relevant funds.**
- 3. Explore existing opportunities to increase participation in voluntary carbon markets.**
- 4. Expand knowledge generation and outreach efforts** on the problems of climate variability and change, land degradation, their linkages, and options for solution.
- 5. Improve coordination of efforts to address climate and land degradation and integration with key government strategies and processes.**
- 6. Expand investment in strengthening technical, organizational and human capacity** relevant to climate and land management issues in SSA.
- 7. Engage community leaders, farmers, and other resource users** in program and project development.
- 8. Address specific policy, institutional, and other constraints to SLM and climate change mitigation and adaptation at national and local level in the context of Country Strategic Investment Frameworks (CSIFs).**



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To achieve success in the first two options, it will be quite important for stakeholders concerned about SLM issues in SSA, including African governments, the UNCCD, NEPAD, the TerrAfrica partnership, and civil society organizations to be actively involved in advocating a continuation of the CDM, inclusion of AFOLU and REDD projects in the CDM, and expansion of adaptation funds.

The remaining options are not closely bound to the UNFCCC process, and can be addressed within the context of the NEPAD/CAADP and TerrAfrica process to develop CSIFs for SLM in each country. **To achieve effective synergies with climate change issues in these processes, it will be important to involve key stakeholders from the climate change community in these processes**, where they are not yet involved.

END NOTE :

- 1 For more information on scientific publications from which those figures – and others in the document – are extracted, please read the complete version of the issue paper.



TerrAfrica is a partnership that aims to address land degradation in Sub-Saharan Africa by scaling up harmonized support for effective and efficient country-driven sustainable land management (SLM) practices.



O U R L A N D – O U R W E A L T H , O U R F U T U R E , I N O U R H A N D S



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