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Economics of Land Degradation in Eastern Africa

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ELD THE ECONOMICS OF LAND DEGRADATION
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MAIN FINDINGS

1 Recent assessments using Geographic Information System (GIS) techniques show that about 27 percent of the land area of sub-Saharan Africa is covered by land degradation 'hotspot's[1].

2 Key **proximate** causes of land degradation in Eastern Africa include: climatic conditions, topography, and inappropriate land management practices. Important **underlying** causes are: land tenure, poverty, population density and a weak regulatory setting for agricultural and environmental sectors[2].

3 Economic implications of land degradation are enormous. It diminishes the productive capacity of agricultural land, rangelands and forest resources. Therefore, a **sustained and strategic plan of action** for preventing and mitigating is needed.

4 There is a need to **prioritize and harmonize policies** that nurture and promote sustainable land management practices and technologies. Specifically, insecure land tenure may act as a disincentive to investments in sustainable agricultural practices. A growing population, without sustainable land management behavior and practice, may exhaust the capacity of land to continue providing ecosystem services.

5 Ineffective **institutional mechanisms and policy frameworks** to preserve forests and proper land management must be addressed. Adequate information and capacity building are needed to help farmers improve the use of sustainable land management practices. Financial and capital barriers hindering the access to inputs (for example through provision of credit) should be removed.

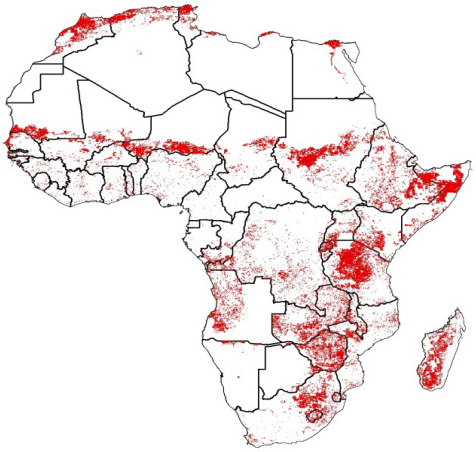
State and extent of land degradation in Eastern Africa

Land degradation remains a serious threat to livelihoods in Eastern Africa. The total population of sub-Saharan Africa is currently estimated at 750 million people, but it is projected to exceed the one billion mark by 2020. The **demand for food** is putting increasing pressure on the natural resource base. The current debate on the land degradation situation in Eastern Africa is short of consensus because of misunderstanding, misinterpretation and discrepancies in the available information.

There is a broad consensus that **sustainable land management practices** are critical in reversing the current land degradation trends and in ensuring adequate and sustainable food supply for the future. Some of the good and recommended practices include better production technologies such as improved seed varieties and cultivars, irrigation, and adaptive farming systems. An improved macro-

economic environment, better access to markets and to public services, better infrastructure, and extension services to farmers may increase the adoption of sustainable land use and management practices.

Assessments of land degradation in the region vary in **methodology**, and thus in outcome. More recently, satellite–based imagery and remote sensing techniques have been utilized to identify the magnitude of land degradation at global, regional and national levels. This involves the use of the Normalized Difference Vegetation Index (**NDVI**), derived from Advanced Very High-Resolution Radiometer (**AVHRR**) data. This methodology also helps in mapping the land degradation '**hotspots**'. For example the land degradation index map for sub-Saharan Africa shows that about 27% of the land area is subject to degradation processes including soil degradation, overgrazing, or deforestation[3]. Key hotspots areas include south-western regions in Ethiopia, western Kenya, southern Tanzania and eastern Malawi. These 'hotspot' areas are characterized by a host of factors such as high population pressure, farming activities on steep slopes, frequent famines, and intensive crop farming.



Biomass productivity decline over 1982-2006, Source: Le, Nkonya and Mirzabaev (in press).

Drivers of land degradation

There are two broad categories of causes of land degradation: **proximate and underlying causes.** Proximate causes are those that have a direct effect on the terrestrial ecosystem. These include biophysical (natural) conditions related to climatic conditions and extreme weather events such as droughts and coastal surges, which may, for example, cause land salinity. **Proximate causes** are also related to unsustainable land management practices (anthropogenic) such as over-cultivation, overgrazing and excessive forest conversion. On the other hand, the **underlying causes** are those factors that indirectly affect proximate causes. Poverty, lack of institutions, and insecure land tenure may underlie land degradation by hampering incentives to invest in sustainable land management practices. These drivers will determine the levels of land degradation which in turn determines its outcomes and/or effects.

Productivity and poverty effects of land degradation

The economic implications of land degradation are enormous. To illustrate, about one billion tons of topsoil are lost annually in Ethiopia due to soil erosion – costing the country 3% of its Agricultural Gross Domestic Product[4]. In Tanzania, soil erosion is considered to have affected 61% of the entire land area and land degradation has been ranked as the top environmental problem in the country since more than 60 years[5]. Therefore a **sustained and strategic plan of action** for preventing and/or mitigating is needed.

Land degradation reduces the productive capacity of agricultural land, rangelands and forest resources through the erosion of top fertile soil,

leaching and depletion of nutrients and salinization, among others. The inter-linkages between land degradation and poverty are strong in the rural areas of low income countries where livelihoods largely depend on agriculture. Extensive analysis of the complex linkages of the three key variables; **poverty, declining agricultural productivity and land degradation** is important, especially in developing countries where the objective of achieving food security is still not fully realized. It is projected that land degradation contributes to declining agricultural productivity, and this in turn increases poverty. On the other hand, poverty may also lead to land degradation because of the inability of poor households to invest in natural resources conservation.

Outlook

National and local policies and programs play a critical role in influencing farmers' decisions with regard to land management. Specific policies and programs that affect such socioeconomic and institutional factors include those relating to agricultural research, irrigation, land governance, extension services, regulating input and output markets, access to credit, infrastructure development, and farmers' cooperatives and organizations. It would be worthwhile considering the comparative advantages of customized policy strategies for various regions on sustainable land management, i.e. empowering decentralization.

For instance, for areas with high agricultural potential, policies that facilitate development of credit, input, and output marketing systems could have higher private and social returns. Commercial agriculture is feasible and profitable in these areas and thus, there is a strong potential to increase incomes through sustainable land use (through use of purchased inputs and integrated organic soil fertility management practices, for example). Similarly, for low agricultural potential areas, the initial priority could be increased investments in irrigation and intensification of livestock production through improved management of grazing lands.

Efforts to catalyze development of local institutions to better manage grazing lands through collective action should also be stimulated. Policies and programs with respect to food aid, agricultural extension, education and training in non-farm activities and land tenure are also relevant to achieve productive agriculture and reduce poverty.

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[1] Vlek, et al., (2010). Assessment of land degradation, its possible causes and threat to food security in Sub-Saharan Africa. CRC Press, Boca Raton, Florida, pp. 57-86.

[2] Several sources including; Lambin and Geist (2006); Lal and Stewart (2013); Belay et al., (2014) and Pingali et al., (2014).

[3] Vlek, et al., (2010). Assessment of land degradation, its possible causes and threat to food security in Sub-Saharan Africa. CRC Press, Boca Raton, Florida, pp. 57-86.

[4] Yesuf, et al., (2008). The impact of climate change and adaptation on food production in low-income countries: evidence from the Nile Basin, Ethiopia. Intl Food Policy Res Inst.

[5] Burgess, et al., (2010). Getting ready for REDD+ in Tanzania: a case study of progress and challenges. Oryx 44.03: 339-351.

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