



Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

ZEF

Policy Brief No. 18

Economics of Land Degradation and improvement
in Ethiopia

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September 2015



MAIN FINDINGS

1. About 23% of the total land mass in Ethiopia are degraded¹.
2. Household surveys show that the drivers of land degradation are bio-physical, regional and socio-economic. For example, access to agricultural extension services and secure land tenure play a key role in adopting practices of sustainable land management.
3. The annual costs of land degradation are about 4.3 billion USD in Ethiopia. Land degrading practices on maize and wheat farms lead to additional losses of 162 million USD – representing 2% of the national GDP in 2007.
4. Policies that increase secure tenure rights, improve the quality of extension services and promote initiatives to manage grazing land and forests collectively lead to improved land management and should be encouraged by policies.

Land degradation in Ethiopia

Environmental degradation affects land resources on a large scale. In Ethiopia, several types of land degradation are prevalent: Water and wind erosion, salinization and general physical processes of degradation. It is estimated that around 85% of land mass are to some degree degraded. In particular, soil erosion has severe impacts on fertility and rooting depth, but also the loss of biodiversity is a major threat to agricultural productivity in the Ethiopian

highlands². Especially in the regions of Wolo, Tigray and Harerge, 50% of soils used for agriculture have a depth of less than 10 cm, making them unsuitable for farming³. Thus, land degradation is one of the most serious threats to the country's agricultural productivity and food security.

When we apply the Normalized Difference Vegetation Index (NDVI), which is derived from Advanced Very High-Resolution Radiometer (AVHRR) data, we estimate that between 1982 and 2006, degradation has occurred on 228,160 km², or 23% of the country's total land area¹. Areas that are most affected by degradation include sparse vegetation (32%), mosaic forest (27%), shrub-land (20%) and mosaic vegetation-crop (19%).

Drivers of land degradation

The proximate drivers of land degradation in Ethiopia include deforestation and overgrazing. In addition, small-seed crops which require fine tillage and cultivation on steep slopes contribute to degradation. Further, indirect causes include poverty, land fragmentation and pressure by a high population growth, which also leads to a rising demand for crops and fuel wood. Furthermore, investments in agriculture and animal husbandry are low, quality infrastructure⁴ is lacking and most policies have failed so far⁵.

Impacts of land degradation

With its impacts on food security, land degradation directly affects rural livelihoods through either a decline in crop yields or through the need to apply more inputs for maintaining productivity



levels. Lower crop yields raise poverty rates among agricultural households. The production losses due to water erosion alone could be reduced by 10-30% by 2030⁶.

Economic costs of land degradation

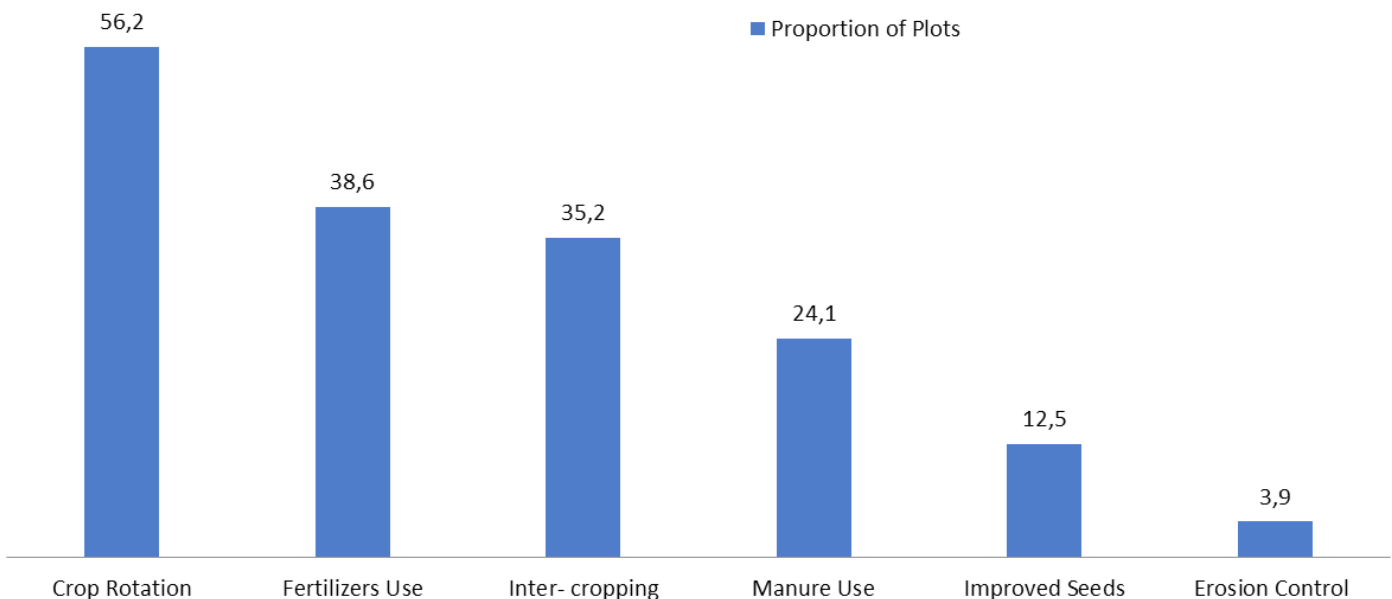
Between 2001 and 2009, there has been a decline in the Total Economic Value in Ethiopia of about 5% - only due to changes in land cover and land use. The highest losses are experienced in Harari with 30%, Addis Ababa with 24%, Dire Dawa with 23% and Tigray with 12%. An increase of 8 % in the Total Economic Value was recorded in the Afar region. The loss in Total Economic Value due to land-use cover changes amounts to annual costs of about 4.3 billion USD, representing 22.5% of the GDP. With regard to land degradation due to land degrading practices, maize yields could decline by 36% and wheat yields by 25% over the next 30 years. In addition, land

degradation could cause losses in milk and meat production of about 38 million USD and 2.4 million USD, respectively. With a planning horizon of 30 years, the costs of action against land degradation amount up to 54 billion USD, whereas the losses from land degradation reach almost 228 billion USD. Thus, every dollar invested in taking action against land degradation returns about four dollars, calculated for a time-frame of 30 years.

Adoption of sustainable land management

The most commonly used methods of sustainable land management are crop rotation, the use of chemical fertilizers and intercropping. About 56% of farmers taking part in the survey practiced crop rotation, while chemical fertilizers were applied by about 39%. About 15% of households did not apply any Sustainable Land Management technology. On grasslands, controlled

Figure 1. SLM technologies adopted in Ethiopia.





grazing and sanctions for overgrazing have been implemented. The likelihood that Sustainable Land Management practices are adopted increases with higher temperatures, rainfall and cultivation on steep slopes. In addition, male-headed households are more likely to adopt measures in this context than female-headed households. In addition, the level of education and the size of a family play a role, as well as the access to agricultural extension services.

Communities frequently take actions on their own to improve ecosystems, for example, by afforestation. To foster the efforts of afforestation, stricter

policies have been enforced in some communities.

Conclusions

The study shows that only solutions addressing the local drivers lead to abating land degradation. For this reason it is necessary to understand households' behavior in terms of land use as well as institutional factors. Local institutions in Ethiopia dealing with collective action and tasks need to be strengthened.

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Picture 1. Soil erosion in Koka Negewo, Oromia Region/Ethiopia.



IMPRINT

Publisher:
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