Sustainable land management in Ethiopia: Economic and policy implications

Fact sheet

Land degradation and its serious consequences are increasing across the globe. For this reason, the UN Sustainable Development Goal (SDG) 15.3 is to "combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and to strive to achieve a land degradation-neutral (LDN) world", whereby the amount and quality of land resources necessary to support ecosystem functions and services remain stable or increase, by 2030. In the context of moving towards that goal, the Economics of Land Degradation (ELD) Initiative conducted a case study regarding the policy implications of adopting sustainable land management (SLM) technologies on Ethiopian smallholder farms.

The Value of Land

Established in 2011, the Economics of Land Degradation (ELD) Initiative aims at transforming the global understanding of the economic value of land, and thus the cost of its degradation. The goal is to improve stakeholder awareness of socio-economic arguments to promote sustainable land management. ELD provides tools and assessments that allow stakeholders to undertake cost-benefit analyses of land and land uses through a total economic valuation and include the results into decision-making.

Background

With a total population of around 112 m, Ethiopia is the second most populous country in Africa, of which almost 80% live in rural settings and depend directly on the land and its services for their livelihoods. **Land degradation and declining soil fertility across the country have affected the country's agricultural productivity and food security** for centuries. Soil erosion by water and nutrient depletion through agricultural soil mismanagement are the most common forms of land degradation in the country and have been accelerating over recent decades.

In response to the above processes, the ELD Initiative conducted a study over the period 2003-2016, covering 12.77 Mha of cultivated agricultural land with 52 crop types across the 9 regional states. Among the study's objectives were assessing the costs of agricultural land degradation and the economic viability of alternative land management approaches based on biophysical and econometric models.

Results

The data indicate a growing trend in agricultural land degradation during the study period. More specific results include:

- Average **soil NPK** (nitrogen, phosphorus, and potassium) **depletion of 768,000 t/year** (or around 60 kg/ha/year)
- Additionally, **781,000 t/year** (61 kg/ha/year) **NPK lost through erosion, gaseous exchange, and leaching**
- As a result, the annual aggregate crop production loss amounts to 104 m tonnes with a market value of US$ 48.35 bn (2016 average weighted aggregate crop price)

From these numbers, it was estimated that the country has the **potential to increase agricultural productivity from 1.89 to 9.92 t/ha/year** by investing in SLM technologies such as stone or soil bunds, terracing, and area closure.

According to the **cost-benefit analysis**, Ethiopia could create a net present value (NPV) of about **US$ 23,132 per ha, with a benefit-cost ratio of 4.05 for the period 2020-2030.**

Contributions to the SDGs

Furthermore, the study indicates that investing in SLM technologies and achieving agricultural LDN would enable Ethiopia (i) to reduce the poverty gap to zero (**SDG 1**), (ii) to increase the total per capita domestic food crop production to 1,146 kg (**SDG**

2), (iii) to create up to about 10 m rural job opportunities, and (iv) to expand the agricultural sector and grow the economy (**SDG 8**) by 2030.

Implications for business as usual and SLM investment scenarios

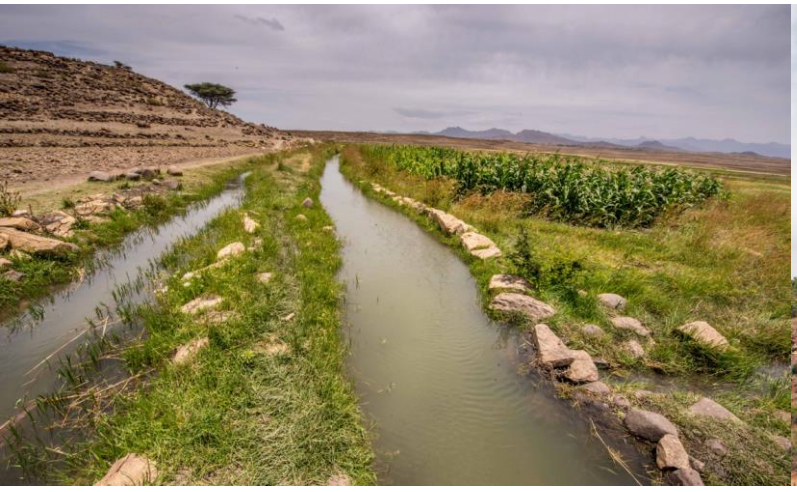
The study reveals that in Ethiopia, **the baseline per capita domestic food crop production at a national level was 348 kg in 2016 and declined to 316 kg by 2020. The figure will further drop to 256kg by 2030** under the business-as-usual scenario, which assumes no investment in SLM to prevent NPK loss and soil NPK depletion. This will cause over 30 m people to fall into poverty and lead to the unemloyment of over 10 m rural people, significantly reducing the contribution of the agricultural sector to the national economy.

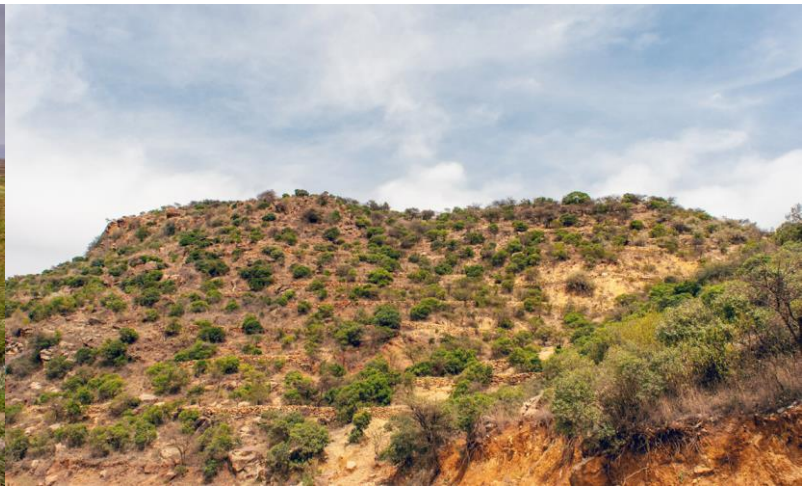
On the other hand, **investing in SLM technologies could prevent production losses and increase the total per capita domestic food crop production to 1146 kg by 2030**. This implies that investments in SLM can help national agricultural LDN (SDG 15.3) and increase its per capita domestic food production and agricultural productivity. SLM could lead to the economic growth of the agricutlural sector at a rate of 110% of the real agricultural 2016 GDP over the period 2020-2030.

Finally, the analyses indicate that investing in SLM technologies would enable Ethiopia to achieve its **international commitments to restore 15 Mha of its degraded forest landscapes by 2030**, the largest commitment made by a single member country for the African Forest and Landscapes Restoration Initiative (AFR100) launched at the Global Landscape Forum at COP21.

Conclusion

Empirical evidence suggests that investing in SLM technologies can help achieve a triple win in Ethiopia: end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. However, investments in the country's agriculture in general and in SLM technologies in particular must increase significantly over current levels through a combination of higher public investment and better incentives for farmers and the private sector to invest into these more sustainable farming approaches.





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