Evaluating landscape management interventions in Ethiopia: Insights from local and scientific knowledge

Desalegn Tegegne[1], Stefan Sieber[2,1], Goetz Uckert[2], Rediet Girma[3], Awdenegest Moges[3], Wolde Mekuria[4]

[1] Humboldt-Universität zu Berlin, Germany
[2] Leibniz Centre for Agric. Landscape Res. (ZALF), Sustainable Land Use in Developing Countries (Sus-LAND), Germany
[3] Hawassa University, Agricultural Engineering, Ethiopia
[4] International Water Management Institute (IWMI), Ethiopia

Abstract

Several global, regional, and national efforts have been exerted to address the impacts of land degradation on ecosystems and people's livelihoods. However, studies integrating local and scientific knowledge to assess the benefits and disbenefits of these efforts are lacking. We used Halaba, Ethiopia, as a case study, and combined local and scientific knowledge to (i) examine the societal challenges, (ii) assess the drivers, pressures, state, impact, and responses to land degradation, and (iii) evaluate the benefits and disbenefits of adopted sustainable land management (SLM) practices. The study identified diverse land resources, with agricultural land being the most crucial for livelihoods. Community insights and the spatial analysis revealed uneven distribution of land resources, affecting equitable access to these resources by the different groups of communities. The study revealed seasonal variations in land resource availability, such as water and livestock feed, driven by rainfall patterns, suggesting the need to expand water infrastructure and feed development interventions. Dependency on land resources varies by gender and wealth, with men relying on agricultural land, women on a wider range of resources, wealthier households favouring farmland and grazing land, and poorer households depending on forests and community ponds. These results suggest the need for inclusive and tailored SLM practices to ensure equitable resource use. Changes in human behaviour have put pressure on land resources, causing environmental, social, and economic shifts, including ecosystem degradation, food insecurity, migration, school dropouts, loss of human life and livestock, and increased poverty. A range of physical and biological SLM practices was implemented to mitigate these impacts. Insights from local and scientific knowledge highlighted significant environmental, economic, and social benefits of these interventions, such as restoring degraded ecosystems, improving vegetation composition and biodiversity, rehabilitating gullies, controlling soil erosion, conserving moisture, increasing agricultural productivity, and improving access to essential resources like fuelwood, water, and livestock feed. We suggest integrating local knowledge, ensuring social inclusivity, and balancing physical and biological conservation measures in future planning and design of SLM practices. Prioritizing affordable, low-cost technologies, maintaining consistent follow-up and community incentives, and scaling successful practices with long-term investment will enhance ecological restoration and livelihood resilience.

Contact Address: Desalegn Tegegne, Humboldt-Universität zu Berlin, Berlin, Germany, e-mail: d.tegegne@cgiar.org