Stakeholder Assessment of Opportunities and Constraints to Sustainable Land Management in Ethiopia
Acknowledgments

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**Acronyms and Abbreviations**

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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AEZ</td>
<td>Agroecological zone</td>
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<tr>
<td>AGDP</td>
<td>Agricultural gross domestic product</td>
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<td>BoARD</td>
<td>Bureau of Agriculture and Rural Development</td>
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<td>DA</td>
<td>Development Agent</td>
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<td>EIAR</td>
<td>Ethiopian Institute of Agricultural Research</td>
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<td>EPE</td>
<td>Environmental Policy of Ethiopia</td>
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<td>EPA</td>
<td>Environmental Protection Authority</td>
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<td>EPLAUA</td>
<td>Environmental Protection, Land Use, Administration and Use Authority</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>GTZ</td>
<td>Deutsche Gessellschaft für Technische Zusammenarbeit</td>
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<td>HLI</td>
<td>Higher learning institutes</td>
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<td>ICRAF</td>
<td>International Centre for Research in Agroforestry</td>
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<td>LUPRD</td>
<td>Land Use Planning and Regulatory Department</td>
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<td>MoARD</td>
<td>Ministry of Agriculture and Rural Development</td>
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<tr>
<td>ME</td>
<td>Monitoring and evaluation</td>
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<td>MERET</td>
<td>Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods</td>
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<td>NGO</td>
<td>Nongovernmental organization</td>
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<td>NRM</td>
<td>Natural resource management</td>
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<td>PADETS</td>
<td>Participatory Demonstration Extension Training System</td>
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<td>RARI</td>
<td>Regional agricultural research institutes</td>
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<td>SLM</td>
<td>Sustainable land management</td>
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<tr>
<td>SNNP</td>
<td>Southern Nations, Nationalities, and People's Region</td>
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<td>SWC</td>
<td>Soil and water conservation</td>
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<td>TVT</td>
<td>Technical and vocational training</td>
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<td>WFP</td>
<td>World Food Programme of the United Nations</td>
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<td>ZoARD</td>
<td>Zonal Office of Agriculture and Rural Development</td>
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<td>WoARD</td>
<td>World Office of Agriculture and Rural Development</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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Abstract

Stakeholders’ perceptions of opportunities and constraints to sustainable land management in Ethiopia were assessed through interviews and a review of secondary data. Stakeholders included farmers as well as representatives of development agencies, agricultural organizations (at the federal, regional, zonal, and woreda level), donors, nongovernmental organizations (NGOs), and agricultural research systems.

Stakeholders generally perceive that the numerous, well-intentioned but piecemeal interventions undertaken over the last few decades have contributed little to reversing the negative spiral of land degradation, for several reasons: (1) the top-down, nonparticipatory approach was generally unsuited to specific farming systems; (2) most funding for sustainable land management (SLM) was channeled to so-called “low-potential” areas, neglecting “high-potential” areas where serious land degradation is now occurring; and (3) agricultural research, training, and extension were not sufficiently integrated. In particular, research, training, and extension institutions are crop-focused, top-down, and quota-driven; they lack institutional linkages with each other and interdisciplinary linkages within their own walls; and thus they are ineffective in addressing integrated soil/water and watershed management issues. Development Agents (DAs), who are supposed to serve as the frontline change agents and main transmitters of information on SLM, often know less about these issues than farmers themselves.

According to stakeholders, participatory, integrated, technically high-quality, and economically profitable interventions are needed to achieve sustainable results. Good examples are the interventions funded by the World Food Programme (WFP) under MERET (Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods), and interventions by the Deutsche Gesselschaft für Technische Zusammenarbeit (GTZ) in specific microwatersheds. At the policy level, it is imperative to abolish the dichotomy between areas of “high” and “low” potential in devising policies for agricultural and rural development, to ensure that limited SLM funds are invested wherever the best returns can be obtained. In the agricultural research, training, and extension systems, it is essential that fundamental, coherent reforms are made to strengthen work on SLM in particular and agricultural technology dissemination in general. To achieve this goal, these systems must reorient their philosophy and incentive and accountability structure. At the same time, capacities at the woreda level for supporting watershed management (especially the preparation of high-quality plans) should be increased so that funds from various sources for SLM and related matters may be used more effectively. Agricultural training for DAs must become relevant and sufficiently practical if they are to competently advise farmers and communities on integrated soil and water management as well as integrated watershed management.
1.0 Introduction

1.1 The natural resource base and land degradation: An overview

Ethiopia is one of the best-endowed countries in sub-Saharan Africa with respect to natural resources and diversity of agricultural production environments. Ethiopia's location in the tropics, combined with an impressive variation in elevation throughout the country, allows it to enjoy both temperate and tropical climates. This climatic diversity is complemented by the country's wealth of biophysical resources, including exceptional biodiversity, relatively fertile soils, and extensive freshwater resources. For millennia, these rich natural resources have been the foundation for agricultural development and for meeting the basic needs of millions of rural people.

Despite this enormous biophysical potential, Ethiopia suffers from the linked and mutually reinforcing problems of land degradation and extreme poverty. These problems are further aggravated by high population pressure—the national population is currently about 72 million and growing by 2.5 percent annually—and climatic variability, as well as top-down planning systems, inappropriate and/or poorly implemented policies and strategies, limited use of sustainable land management practices, frequent organizational restructuring, and limited capacity of planners, researchers, and people who use the land.

It is estimated that close to 1.9 billion tons of topsoil are washed away every year, mainly in the highlands, and are carried out of Ethiopia altogether (LUPRD/UNDP/FAO 1984; FAO 1986). The localized, on-site effects of this land degradation, especially the reduction in agricultural production, are quite significant, with estimated costs ranging from 2 to 3 percent of agricultural gross domestic product (AGDP) per annum (Yesuf et al. 2005). The Environmental Protection Authority (EPA) estimates that approximately 17 percent of Ethiopia's potential annual AGDP is permanently lost because of physical and biological soil degradation (EPA 1997). The off-site effects of land degradation are evident as well, in the siltation of dams, reservoirs, wetlands, lakes, and productive agricultural land in low-lying areas such as the Ambasel Plain of Wollo. More generally, land degradation has negatively affected agricultural production, fostering widespread food insecurity (affecting 5–7 million people) and poverty (more than 45 percent of the total population live below the absolute poverty line).

1.2 Causes of land degradation

The causes of land degradation are complex and diverse. Although influenced by natural and socioeconomic factors, land degradation in Ethiopia is mainly a function of heavy reliance by a growing population on exploitive subsistence agriculture and rudimentary production methods. The farming system, particularly in the highlands, is dominated by cereal crops such as teff and wheat. In growing these crops, which provide little ground cover when the most erosive rains fall (in June–August), farmers frequently work and pulverize the soil, rendering it more susceptible to erosion. These circumstances, combined with poor land management and the increasing cultivation of marginal lands, contribute to land degradation and declining agricultural productivity.

The use of wood and other biomass for fuel and the expansion of agriculture into forested areas fostered a high rate of deforestation and ultimately stripped the land of vegetative biomass, exposing it to high levels of soil erosion. Ethiopia's formerly dense forests once covered an estimated 40 percent of the country, but they are now said to cover only 2.4 percent (Shibru and...
Even this remaining forest is being depleted at an alarming rate, partly because nearly 95 percent of the nation's energy consumption is from biomass fuels.

Livestock pressure and poor stock management (mainly based on the free grazing system) are other major sources of land degradation. Only 25 percent of Ethiopia's high livestock population—which includes 35.3 million cattle—graze in the rangelands (the lowland areas of Afar, Somali, and Borena), while the remaining 75 percent graze in the highlands, leading to serious overgrazing of areas already under high agrarian pressure (EPA 2005). In the highlands, the expansion of grazing beyond the land's carrying capacity occurs at the expense of the remaining natural vegetation and further land degradation. The scarcity of grazing land and livestock feed has forced the widespread use of crop residues to feed livestock. When crop residues are removed for feed and cow dung is used for fuel, the soil loses organic matter and nutrients. This breach in the soil nutrient cycle seriously depletes soil quality, increases erosion, and eventually reduces soil productivity.

Several efforts have been made to promote sustainable land management (SLM) in Ethiopia, with mixed success. For example, in most places where soil conservation was implemented in the 1970s, farmers either totally or partially destroyed the conservation structures. Of the total conservation measures implemented between 1976 and 1990, only 30 percent of soil bunds, 25 percent of stone bunds, 60 percent of hillside terraces, 22 percent of the planted trees, and 7 percent of the reserve areas were still in place by 1994 (Nurhussen 1995). A recent survey in the Amhara region showed that only 30 percent of soil and water conservation structures implemented in the past 25 years are still in place (EPLAU 2004). On the other hand, there are pockets of success in different parts of the country. Some of these successes reflect a deep-rooted history of indigenous experience with land management, as in the Konso and Ankober areas, while others reflect innovative interventions by donor-supported projects. Scaling up of successful SLM practices has been limited, however.

This paper captures stakeholders' perspectives on opportunities, constraints, and possible solutions for using successful SLM practices on a wider scale in Ethiopia. The paper identifies information that different stakeholders need to make decisions on SLM, along with the knowledge gaps hindering wide-scale adoption of SLM practices. It concludes by proposing a possible applied research agenda to support informed decision making on SLM and to improve the promotion of SLM in the country. The information presented in this paper is based on interviews of numerous stakeholders—including farmers and representatives of development agencies, agricultural organizations (at the federal, regional, zonal, and woreda levels), donor agencies, nongovernmental organizations (NGOs), and agricultural research systems. The paper also draws upon a review of secondary data sources, including strategies, policies, evaluation reports, research outputs, and guidelines developed by different actors.

1 We define “sustainable land management” in the Ethiopian context as the use of renewable land resources for agricultural and other purposes to meet individual and community needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions through systematic use of indigenous and scientific knowledge/technologies. In this regard, SLM involves more than the use of physical soil conservation measures; it also includes the use of appropriate soil fertility management practices, agricultural water management, forestry and agroforestry practices, forage and range land management, and the application of these measures in a more integrated way to satisfy community needs while solving ecological problems.
2.0 Stakeholders Involved in Promoting SLM Practices

Stakeholders that actively promote SLM in Ethiopia fall into six broad categories: government development agencies, research institutes, agricultural/environmental education institutes, farmers, regulatory agencies, donors, and NGOs. The function of each stakeholder group and the roles they play are briefly discussed below.

- **Government development agencies** include the Federal Ministry of Agriculture and Rural Development (MoARD), the regional, zonal, and Woreda bureaus (BoARD, ZoARD, WoARD), and the community-level development agents (DAs). Together they determine the approach for promoting SLM, the types of SLM technologies to be promoted, and mechanisms of implementation. Despite some intervention by local administration in different forms, the planning, implementation, and monitoring and evaluation (ME) processes are largely carried out by these agencies.

- **Research institutes** include the national and regional research organizations (EIAR), regional agricultural research institutes (RARIs), federal and regional agricultural research centers, higher learning institutes (HLIs), and international research centres (mainly composed of commissioned research forums and groups, including the research institutes supported by the Consultative Group on International Agricultural Research). Depending on their particular mandates, these organizations generate SLM technologies suited for Ethiopia's agroecological zones (AEZs), undertake systematic studies to foster successful implementation of SLM practices, help policy makers make informed decisions, and assist in equipping extension agencies with required information and mechanisms of promotion. Research institutes are also responsible for sourcing proven international experiences and technologies and customizing them for local conditions.

- **Regulatory agencies** include the EPA and regional Environmental Protection, Land Administration and Use Authorities (EPLAUA), all of which are still in their formative stages. Despite its infancy and staff limitations, the EPA has formulated a number of environmental policies and strategies. Regional authorities are tasked with land registration and certification with a view to increase land tenure security and consequently promote improved land management. Recently, most of the regional authorities—Amhara, Tigray, Oromya, and Southern Nations, Nationalities, and People's Region (SNNPR)—formulated and began to implement regional land administration and use policies.

- **Agricultural and environmental education institutes** train agriculture and natural resource management (NRM) professionals at different levels and include agricultural universities and colleges as well as technical and vocational training (TVT) colleges. Although recently the number of institutes and graduates has increased substantially, the quality of education (except in a few cases) is not up to standard. There is a general perception that graduates are neither sufficiently rich in theoretical knowledge nor in practical experience to promote SLM practices.

- Several **donors**, including GTZ, WFP, the US Agency for International Development (USAID), World Bank, and others, support the promotion of SLM practices in different parts of the country. Some of these donors provide support but are not involved in the implementation of projects. Others provide both resources and hands-on technical support. A good example of this second kind of arrangement is the MERET project, in which the donor
Environmental rehabilitation often is the major component for international and local NGOs, especially those involved in agricultural development. This group is highly efficient in using innovative methods and approaches to promote SLM (such as the integration of land management with income generation, credit, value addition, and marketing). Although these initiatives have had some isolated success, one limitation of NGOs is that they often address very small geographical areas, and there is no guarantee that success will be sustained or improved once their projects end.

3.0 Opportunities for Scaling up Successful SLM Practices in Ethiopia

Previous attempts at halting land degradation have left a trail of lessons, experiences, and opportunities that are a valuable starting point for promoting and scaling up successful SLM initiatives in the country. This section highlights key opportunities.

- **Environmental policies and strategies.** Despite dismal implementation, Ethiopia has made commendable efforts in developing its policy and strategic response to land degradation (Asfaw 2003). One of the most important umbrella polices is the Environmental Policy of Ethiopia (EPE), approved by the Council of Ministers in 1997. The policy addresses a wide variety of sectoral and cross-sectoral environmental concerns in a comprehensive manner. Its major aim is to ensure sustainable use and management of natural and cultural resources and the environment (Asfaw 2003). A number of sectoral polices and strategies have been approved to translate this umbrella policy into specific actions. In addition, land use and land administration policies and strategies have been developed by different regions, and an autonomous organization has been established to implement them. Very recently, the federal government approved the national land use and land administration policy and has also ratified several global environmental conventions.

- **Rich experience in participatory watershed management.** The need for genuine participation by communities at all levels of the decision-making process is a key requirement of successful SLM undertakings. Although different approaches to participatory watershed management raise issues that need careful scrutiny, there are very good experiences with a range of approaches in the country. The government has recognised the need for participatory watershed management, and recently MoARD developed a national guideline on community-based participatory watershed development (Desta et al. 2005) that describes high-potential procedures drawn from selected approaches in Ethiopia.

- **Organizational setup of MoARD and the national research system.** The organizational setup of MoARD and the regional and local bureaus of agriculture, which extend to the kebele level—with three DAs in each kebele; the national agricultural research system, composed of federal and regional institutes and research centres that cover nearly all major AEZs; and the system of HLIs offer key opportunities that could be exploited to implement SLM successfully.

- **Ecological diversity to test a wide array of SLM options.** Ethiopia's highly diverse agroecological environment originates from its location in the tropics and geological processes of landscape formation. This diversity allows a wide variety of SLM technologies
and practices to be tested and transferred in different combinations. Research is not constrained by limited ecological scope to introduce SLM technologies and practices that have proven successful elsewhere in the world.

- **Availability of indigenous and scientific knowledge.** Although some environmentally friendly indigenous land management practices were abandoned for various reasons (mainly population growth and land scarcity), other rich indigenous knowledge and practices can be further exploited. In addition, many SLM technologies have been introduced or generated through research in the country. Some high-potential technologies, such as conservation tillage, tied ridging, and broad-bed planting have not yet been exploited because of adoption problems or lack of proper mechanisms to disseminate the technology.

- **Donor support.** Although the support to SLM is limited, several donors have an interest in SLM interventions.

- **Carbon sequestration projects.** The recent emergence of biocarbon markets targeting afforestation and reforestation projects or agroforestry has presented new opportunities to scale up SLM practices in developing countries. Given Ethiopia’s tremendously degraded mountains and hills, the country could substantially benefit from biocarbon markets by promoting afforestation and reforestation. This approach could lead to a win-win situation, generating more income (from carbon and timber revenue) and improving environmental sustainability. Landless members of communities could also benefit from carbon sequestration projects, if the benefits are distributed among all community members.

### 4.0 Constraints to Scaling up Successful SLM Practices in Ethiopia

The constraints to widespread adoption of SLM practices are probably the most debated issues in the literature on SLM. Most reports deal with constraints affecting single components of SLM, however, with a conspicuous lack of integration among the different components. This focus on isolated aspects of SLM often leads to erroneous conclusions and is sometimes a source of misunderstanding. The constraints presented here are based on holistic stakeholder perspectives encompassing the spectrum of SLM practices.

#### 4.1 Lack of awareness among policy makers of the extent and impacts of land degradation

Land degradation is a long-term and subtle process. Its effects and steady spread are hardly noticeable until they are manifested through drought and/or famine. The subtlety of the process explains why the problem received so little attention before the 1973–74 drought. In addition, land degradation is often presented in mechanical terms—for example, tons of soil lost per hectare per annum, or hectares of forest depleted—statistics that policy makers do not especially appreciate. Among policy makers, it is the loss of productivity and the socioeconomic impacts of degradation that strike a cord. The use of agricultural inputs, even without proper land management practices, can sometimes mask the effects of land degradation, especially in areas with relatively better and deeper soils. For this reason, most decision makers regard degradation as a problem only in highly degraded areas. This lack of appreciation of the problem reflects the absence of information on the costs of land degradation and benefits of SLM practices. Even though some attempts have been made to estimate the costs of land degradation in Ethiopia, they considered only on-site effects without addressing externalities. Moreover, very few attempts have been made to develop easy-to-apply diagnostic tools and models to help decision makers and planners to make informed decisions about land degradation.
4.2 Lack of awareness of the nature and technical requirements of SLM practices

Another very important misunderstanding, not only among policy makers but also among many practitioners, is that soil and water conservation (SWC) measures are a panacea for land degradation. The integration of different SLM practices and technologies to make SWC measures more effective and enhance soil productivity is seldom considered. Moreover, the technical requirements of these measures are often forgotten. The purpose and usefulness of different SLM components are misunderstood. Often SWC measures, mainly physical, are confused with SLM, and many think the problem is solved simply by constructing these structures. SWC structures mainly reduce soil loss and runoff and create an enabling environment for further soil improvements. At a minimum, the use of conservation structures must be integrated with soil fertility and moisture management practices to give positive responses in crop production. Further integration with forage production (for bee and livestock enterprises), high-value crop and fruit plantations (below and above bunds), and leguminous plants for soil fertility improvement will help to increase the benefits of all of these practices in improving household income.

Unfortunately, attention is mostly given to the number/quota of interventions but not to their quality, standard, sustainability, and integration with other soil management practices. For this reason, some technologies have been pushed beyond their technical requirements and applicability domains (blanket fertilizer recommendations are one example), sparking resentment among farmers and a tendency to disregard professional opinion.

4.3 Top-down planning approach to technical assistance

Sustainable development can be achieved only when the actual beneficiaries of technical assistance feel they are equal partners and that they, rather than the government, own and drive the process (Ashworth 2005). Long-term sustainability is more likely to be achieved if development is driven from the bottom up and addresses farmers’ and communities’ immediate needs and constraints. Our findings, however, show limited elements of farmer participation in the SLM extension approaches in Ethiopia. The extension system in general uses a top-down approach, with very little participation by communities or households. Even those involved in demonstration plots do not take part in the decision-making process. Decades of top-down planning approaches and an extension system based mainly on a numerical quota system for promoting adoption of preselected technologies have contributed to weak dissemination of proper land management practices and very poor sustainability of conservation measures, ultimately aggravating land degradation in the country.

Apart from its top-down nature, the extension paradigm has never been stable. Often a new approach is introduced without adequately evaluating past experiences and investigating the suitability of the new approach. The Training and Visit (T&V) system, for example, was changed to the Participatory Demonstration Extension Training System (PADETS), with a vision of increasing community participation, but participation was confined largely to implementing demonstration plots cooperatively with farmers on their own land (Ashworth 2005). Currently the PADETS approach is amorphous, with continual addition or reduction of bits and pieces by the different regions. Although extension approaches have been revised, modified, and renamed, they have basically retained their top-down nature. Our survey revealed instances where politicians at regional and national levels were formulating annual agricultural plans without participation of key stakeholders, including key professionals in the field.
4.4 Weak linkages among and between disciplines in generating and disseminating technology

Although the government invests heavily in the institutional framework for national agricultural research, education, and extension, no strong functional links have been created among them. Poor coordination between research, extension, and education has affected technology development and the transfer of technologies from researchers to farmers. Consequently, although each of these systems has expanded in organizational scope and service coverage over the years, their impact in halting land degradation is not commensurate with the investment.

Even within institutions, interdisciplinary linkages are very weak. Forage and agronomy experts hardly work together with NRM experts, for instance. This piecemeal approach has a negative impact on developing effective conservation technologies, information flow, and resource allocation. It also affects the prospects of developing a holistic agricultural planning strategy. For example, when conservation activity is planned, no consideration is given to the influence of livestock on the sustainability of the conservation measures to be implemented. Similarly, when irrigation microdams are constructed, other support activities (particularly those related to treatment of the dam catchment area) are not jointly planned and executed. Weak inter-and intradisciplinary linkages are an artefact of the absence of mutual accountability systems, the limited mandate of the research system (including the HLIs), a weak emphasis on SLM, the lack of incentives for integration, and the limited mandate of extension agents.

A further complication is that, following decentralization, there is no clear linkage and hence formal and inbuilt information exchange system between federal and regional research and extension institutions. Although the federal and regional research institutes participate in an annual national research review, it is very weak and has no efficient feedback mechanisms.

4.5 Limited capacity to plan and implement SLM practices at all levels (including communities)

Extension agents at all levels lack capacity in technical issues as well as methodologies (such as participatory planning techniques) related to SLM. This lack of capacity is caused by: (1) the lack of focused in-service training; (2) the poor quality of training; (3) staff turnover, especially at the woreda level, mainly because an appropriate working environment is lacking; (4) very weak technical backstopping to the woredas and DAs by the federal and regional research system; (5) poor availability and/or lack of appropriate guidelines and reference materials to help professionals improve the quality of their interventions and guide communities in better directions; and (6) incompatibility of the DA curriculum with the current nature of land degradation.

Despite the presence of three DAs at the kebele level, each with different expertise (crop science, animal science, and natural resources), there are no disciplinary boundaries. For instance, an animal science DA is obliged to advise on SWC measures and crop-specific tasks. For this reason, most SLM activities that require engineering knowledge are poorly implemented and often exacerbate land degradation on farmers’ plots. There is also an unclear chain of accountability for DAs, as woreda administrators or other cabinet members can give assignments to DAs without consulting the woreda office of Agriculture and Rural Development. The DAs are sometimes forced to undertake activities outside their line of duty, such as collecting loan repayments, distributing inputs, and so forth (Ashworth 2005). Apart from negatively affecting their major duties, this unclear chain of accountability often puts the DAs in a difficult and undefined position with the communities they serve.
There are also serious limitations in the capacity of the research system with regard to SLM. Most research is piecemeal, lacking integration to holistically address SLM. Most researchers working on SLM, especially in regional centers, are junior and lack sufficient reference material and appropriate technical backstopping. Within the natural resources wing of the research system, there are critical knowledge gaps with respect to land degradation, SWC, and agricultural water management engineering, compared to soil fertility and forestry.

Efforts to empower communities in aspects of SLM are very weak, partly because of limited capacity at woreda and kebele levels but mostly because of the top-down planning approach, which constrains proper management, sustainability, and continuity or replication of SLM practices. Even though occasional training opportunities are offered to farmers by researchers in some areas, farmers express concern that the training is too short, too theoretical, and often designed for literate people.

4.6 Limited information and networking on SLM

Appropriate information on the resource base, magnitude of land degradation, the costs and benefits of applying SLM, and the nature of different SLM practices is required to make decisions at all levels. Most of this information is not available in an organized and easily accessible form. Where information is available, it is poorly documented, incomplete, outdated, or not designed to be used by different stakeholders. There are no networks for its dissemination or for sharing information among stakeholders. Nor are there easy communication systems and channels. The lack of information on expected profitability and on-site and off-site economic costs of particular technologies hampers farmers’ decisions to adopt introduced SLM practices. Often farmers are informed about the benefits of SLM practices only in qualitative terms, which rarely elicit their willingness and enthusiasm to adopt those practices.

4.7 Policy- and strategy-related constraints

Despite the presence of a number of important policies and strategies related to the environment, proper implementation has not met with success. As Idachaba (2001) argues, policy analysis is the easier part: “the much more difficult and rather murkier part is to get the policy implemented and adopted by users.” In addition to weaknesses in implementation, some policies and strategies in and of themselves hinder adoption and sustainability of SLM practices. One of the most important strategies frustrating the implementation of SLM practices is the old dichotomy of the country into “high-potential” and “low-potential” areas, with the associated biases in implementing SLM practices. According to Carucci (2005), this is the most misplaced and largely the most incorrect differentiation made in Ethiopia with respect to SLM. This categorization, which is mainly based on rainfall, is instrumental in determining approaches to mitigating land degradation in the different areas. As noted, the misconception that land degradation is not a problem in “high-potential” areas has caused the government and other actors to focus on the “low-potential” areas. One result has been the degradation of many high-potential areas, which could otherwise have been avoided (Zeleke 2000).

Land tenure is another policy issue perceived by stakeholders as seriously affecting investments in land management. After the 1975 land reform, land was nationalised and farmers were granted

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2 “High-potential” areas are also described as food-secure, surplus-producing areas that are not subject to drought stress, whereas “low-potential” areas are described as food-insecure areas that produce no surplus food and are subject to drought stress.
usufruct rights. However, the frequent redistribution of land negatively affects the implementation and sustainability of SLM. Recently different regions have promulgated land use and administrative policies that generally limit (but do not prohibit) frequent land redistribution. Even so, much remains to be done in terms of building awareness and confidence among farmers. The absence of a fully mandated organization for land at the federal level is another strategic gap that many stakeholders believe has resulted in a lack of direction in proper land utilization and management.

The other constraint seriously affecting the implementation, effectiveness, and sustainability of SLM practices is the lack of an appropriate strategy for harmonizing donor resources and approaches. Although support for the environment from different donors is limited, each donor has its own procedures and approaches and wants to have its own isolated sites. In most cases, the confusion this creates outweighs the benefits (Zeleke 2003). Most donors have their own comparative advantages, but few are willing to share experiences or combine resources for better impact. It is not surprising to find more than two donor-assisted projects sharing a common objective in one woreda, each with its own target area, planning, implementation, and financial procedures.

4.8 Socioeconomic and biophysical constraints

Many socioeconomic and biophysical constraints hinder decisions to invest in and sustain SLM practices in Ethiopia. Among these, poverty is the most fundamental constraint faced by most Ethiopians. Poverty causes enormous environmental damage as the poor discount the future heavily and are forced to mine the rapidly deteriorating natural resources in their surroundings (Ermias 2003). There is a strong nexus between land degradation and worsening poverty in the country (Grepperud 1996; Holden, Shiferaw, and Wik 1998; Shiferaw and Holden 1998). The majority of the poor are concentrated in rural areas, where their livelihoods depend on small-scale crop and livestock production and rural labor markets. They often supplement their subsistence by making charcoal and collecting fuelwood from the remnant communal bush or shrubland. These efforts considerably limit the time, options, capacity, and resources available for the poor to apply SLM practices, including external inputs and improved technologies.

Stakeholders perceive that unchecked population growth is the other major socioeconomic challenge facing Ethiopia. Population growth contributes not only to the worsening of poverty but also to land degradation, as it hinders proper land management practices in the different parts of the country. The impact of population growth on land management is context specific (Tiffen, Mortimore, and Gichuki 1994; Pender et al. 2001; Ermias 2003; Kruseman 2003; Yesuf and Pender 2005). In Ethiopia, however, where there are no significant off-farm sources of livelihood, SLM approaches are top-down, nearly 85 percent of the population depends on subsistence agriculture, literacy levels are low, and cultural barriers are many, population growth indeed negatively affects the sustainability and scaling up of land management practices.

Climate variability presents a significant biophysical constraint to successful implementation of SLM practices. The drylands, covering 70 percent of Ethiopia, are particularly vulnerable to the effects of climate change, including desertification and drought. In some parts of the country, climatic variability negatively affects the sustainability of SLM practices.
4.9 Institutional instability

Even though tackling land degradation has been a priority in the country, institutions dealing with NRM have suffered frequent restructuring, which undermines a sense of ownership by program staff, results in high staff turnover, wastes institutional capacity, causes discontinuity in activities and initiatives, and causes a loss of institutional memory. Policy makers have been revising institutional configurations for nearly three decades without considering the damage this inflicts on the country’s economic development. Whenever new restructuring is planned, it is often done without serious consideration of consequences. As a result, many important documents, established linkages and joint activities, site-specific information of high value, skills that took years of investment, methodological approaches resulting from years of experimentation, and other kinds of capital are lost.

4.10 Shortage of resources and incentives

The current level of land degradation in many parts of Ethiopia requires huge investment in different forms if it is to be reversed. It needs systematic integration of public investment with donor-supported resources. It requires departing from the piecemeal approach of many small projects, each with their own territory and rules. Above all, it requires efficient utilization of the available resources (human, financial, and nonmonetary) for better impact. This has not been the case in Ethiopia, however, where (1) resources allocated to fight degradation are relatively meagre and/or poorly utilized, compared to the level of the problem; (2) resources are highly scattered, not harmonized, and mostly address only pieces of the overall problem; (3) projects are attached to rigid procedures for using funds; (4) resources are often not available on time; and (5) public investment (directed mainly to fertilizer and “high-potential” areas) has not been integrated with donor support (directed mainly to cash, food, and nonfood items for environmental rehabilitation, concentrated in highly degraded areas).

The other problem that reduces the efficiency of donor funds for environmental rehabilitation is the artificial differentiation of beneficiaries into “poor,” “very poor,” and “better-off” farmers. Differentiation of communities into poverty categories leads to irrational use of resources, because it simply divides the same group into superficial classes. Often farmers having one ox or cow are considered better-off, for instance, and denied any form of support to invest in land management. This principle of addressing the poorest of the poor leads to the liquidation of the remnant assets of many households so they can benefit from the entitlement, which is often more valuable than the meagre assets they own.

The cost of rehabilitating degraded areas is always high and requires huge resources over a long period. Only a very few donors, such as WFP and GTZ, are able to grant this kind of support. Even so, their projects have not expanded to adjacent areas because so much needs to be done within the project areas themselves, or because of insufficient incentives, or because an additional degree of complexity discouraged spontaneous adoption.

5.0 Information Needs and Knowledge Gaps Related to Scaling up SLM

Our survey identified a number of key information needs and knowledge gaps with implications for scaling up SLM. Addressing these gaps will lead to increased awareness of land degradation (and hence attention) by policy makers, and it will improve decision making on SLM by potential adopters.
Information on the extent and impacts of land degradation. As detailed earlier, the extent of land degradation and the attendant damage on natural resources and the economy are not clearly understood, particularly by policy makers and some development partners. For some, land degradation must be addressed only when the land is completely degraded. Often annual losses of billions of tons of topsoil and thousands of hectares of natural forest are reported without site-specific information about the resulting economic losses. The available information on rates and extent of degradation is crude and outdated and must be updated. Decision makers need information on the impacts and economic loss caused by land degradation, but few studies measure these costs. When they are measured, the estimated costs are neither inclusive of all land degradation processes nor free of methodological flaws (Yesuf et al. 2005). There is an acute need to highlight the immediate and cumulative costs of land degradation and to present the impacts in easily comprehensible forms. Although some site-specific case studies on these costs have been done, in general they were not properly targeted to policy makers and communities or translated into preventive measures and practical actions. Aggregated and disaggregated information on the impacts of land degradation should be translated into monetary terms, including possible cumulative impacts if actions are not taken today.

Information on costs and benefits of SLM practices in different contexts. In most cases, SLM practices, particularly SWC measures, are introduced to communities without communicating their economic impacts and the need to integrate the new practices with other technologies to improve their impact. The monetary costs and benefits of interventions under different scenarios are virtually neglected (Yesuf and Pender 2005). Despite attempts to develop some generic values—for instance, the work norms developed by WFP (2000)—they are often intended for calculating project costs rather than informing community decision making on SLM.

Information on the nature of SLM practices. Information is also needed on the characteristics of SLM practices, including design, standards, integration and management requirements, and their suitability to the different AEZs. Hurni (1996) and ICRAF (2005) attempted to address this issue, yet these efforts were too narrow, addressing only technical requirements with little consideration of possible community needs. Nor were these efforts linked with focused in-service training for planners, decision makers, and land users. A proper inventory of successful SLM practices is needed, and recommendation domains must be categorized clearly if SLM practices are to be successfully scaled up.

Additional information for scaling up SLM practices includes, inter alia:

- Technical standards and specifications for SLM practices used in Ethiopia, to clarify the specific requirements (social and biophysical) for each practice (for example, the requirements for integrating different SLM practices for maximum benefit).
- Requirements and modalities to link and integrate research, extension, and education effectively for efficient promotion of SLM practices across the country.

6.0 Possible Applied Research Agenda

Our survey identified critical issues affecting the success of SLM interventions. Some are linked to a lack of awareness, whereas others reflect a lack of appropriate knowledge or information. Effective promotion of SLM in Ethiopia requires targeted, participatory, applied research to fill
these knowledge gaps and also cater for the information needs of different stakeholders. We propose the following applied research agenda to fill the gaps identified during the survey:

- Reexamine SLM recommendation domains in Ethiopia and the implications for SLM and rural development.
- Assess the planning, implementation, and monitoring and evaluation (ME) systems and required capacity for successful implementation of SLM programs in Ethiopia. This effort should include a reexamination of the roles of different actors on the different stages of SLM: technology generation or introduction, testing, and demonstration; planning; implementation; and ME.
- Assess alternative approaches to promoting SLM. Identify approaches that work effectively in different contexts, and identify the means of scaling up these approaches.
- Analyze gaps in SLM technologies and practices to address the diverse agroecological settings within Ethiopia.
- Reexamine the linkages between research, extension, and education for SLM and suggest alternatives to improve them.
- Assess the resource base, the status of land degradation, and the impacts of land degradation. Establish databases using state-of-the-art technologies.
- Design and apply a simple cost-benefit framework to assess the impacts of land degradation and SLM practices.

7.0 Conclusion and Recommendations

This paper has explored stakeholders' views of current opportunities for controlling land degradation and promoting sustainable SLM in Ethiopia. It also identified major constraints and gaps in information and knowledge that hinder the promotion of SLM practices, and it developed an agenda for applied research. Although some of the issues raised here will be resolved only in the medium term or beyond, a number of actions can and should be taken in the near term. Make current systems more responsive and efficient

The extension, agricultural research, and education systems need reorientation to become more responsive and efficient in addressing land degradation. One of the most important actions is to shift the paradigm in the planning system away from a top-down approach and towards a participatory or demand-based approach. This shift does not necessitate developing a new strategy or methodology but rather adding a few elements to the systems' planning frameworks. The guidelines for community-based participatory watershed development recently developed by MoARD (Desta 2005), if they are applied, have the potential to substantially improve the efficiency of the extension system and hence sustainability of SLM measures. The guidelines should be made widely available in all local languages and actually used to develop participatory watershed management plans, with backstopping where necessary. There is also a need to foster research, education, and extension linkages to improve technology generation and dissemination. This effort will require modification of the planning, implementation, ME, and reporting system and creating an indirect incentive mechanism to improve accountability, with particular importance given to downward accountability. In addition, there is a need for intra- and interdisciplinary integration. In the education system, the curriculum must be revised to be more responsive to the demands of the extension and education systems. The balance between theory and practical training needs to be revised. In general, there is also a need to improve capacity in these systems through on-the-job training and increased human resources.

Redefine recommendation domains for SLM. As stated earlier, Ethiopia is arbitrarily divided into “high-potential” and “low-potential” zones. This division has misinformed decisions to
promote SLM. The definition of appropriate recommendation domains for SLM is urgently required. Areas of intervention should be selected for each domain based on comparative advantage.

**Characterize SLM practices.** There is no information on the requirements of indigenous and introduced SLM practices and combinations thereof, including in-depth economic and risk impact assessments in different agroecological settings so decision makers and land users can make informed decisions on SLM. Both indigenous and introduced SLM practices in Ethiopia must be characterized by building on available information. Given the fact that knowledge is not an end in itself, the information should be communicated to the different audiences through easily understandable formats and tools.

**Develop cost-benefit frameworks.** The cost of land degradation and costs and benefits of using SLM practices in different domains must be determined to inform decisions at all levels. Development of a practical, low-cost assessment framework is another essential action that should be undertaken immediately.

**Develop an improved incentive system for SLM.** The lack of incentives, particularly at the woreda, kebele, and community levels (including institutional incentives for integration and collaboration) seriously affects promotion of SLM. We recommend the development of low-cost incentive mechanisms to promote more responsive and integrated approaches. These approaches could include the consideration of integration and demand responsiveness in evaluations of research proposals, or merit-based promotions and awards of recognition to DAs and others who demonstrate superior performance.
References


