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## Poverty-Environment Action for Sustainable Development Goals

### POLICY BRIEF

# Route to Sustainable Land Management in Malawi: Soil Conservation and Restoration

**Background:** Soil and nutrient losses and the consequent decline of soil fertility negatively affect agricultural productivity of the soil. In Malawi, soil loss has been variously reported in the literature as an enemy of economic growth because Malawi is a largely agrarian economy. The Government of Malawi (GoM) recognizes how the sustainable use of natural resources can help achieve the country's development objectives, including food security and poverty reduction. It was against this background that the government of Malawi and its development partners commissioned two studies (technical and economic studies) on the amount and cost of soil loss in Malawi. These studies among others estimated in quantitative terms the level of soil and nutrient loss in Malawi and identified hotspots where the soil and nutrient losses were highest. This study forms the basis for a strategic action plan to ensure sustainable land management (SLM) in Malawi.

**Action plan components:** To achieve our goal for SLM, effective protection, management and use of our assets and values, and reduction of threats and constraints, this action plan has two main components:

**The technological components of the action plan:** SLM is grounded in the principles of improving water use efficiency and water productivity; improving soil fertility; managing vegetation; and attending to microclimatic conditions. SLM practices therefore seek to reduce water losses (from runoff and evaporation) by enhancing water harvesting, infiltration and water storage, and improving irrigation and managing surplus water. They increase soil fertility by improving surface cover using crop rotation, fallowing, intercropping, applying animal / green manure, composting (ideally as part of an integrated crop-tree-livestock system), and by applying supplementary inorganic fertilizer as needed. SLM practices can also trap sediments and nutrients through the use of vegetative and structural barriers. Microclimatic conditions can be addressed through the use of windbreaks, shelterbelts and trees for shade (via agroforestry and multi-storey cropping). Not all SLM practices target each of the variables listed above, and they can be employed individually or in combination, depending on factors such as tradition, suitability in light of crop choices and the terrain. Each SLM practice also has



a unique set of costs and benefits (perceived and actual). While the literature provides an increasing body of evidence (from Malawi and elsewhere) that SLM can be effectively employed to improve soil quality and increase crop production, for farmers'/land users to adopt SLM requires them to gain a higher net return on their investments, lower their risks, or both. There is also a need to balance costs and benefits over different time scales (short and long term).

Building on mitigation identified in this study and elsewhere the recommendations include:

*In the short term*

- Adequate use of inorganic fertilizers to: quickly boost up nutrient levels by replacing those lost annually and quickly raise yields and biomass
- On the same land, application of organic matter (OM) (e.g. crop residues, khola manure) to supplement fertilizers
- Planting of vetiver grass on the contour
- Alignment of ridges on the contour
- Use of tillage practices which have minimum adverse effect on the soil structure
- Intercropping food grain legumes and cereals.

*In the medium term*

- Continue applying fertilizers while reducing the emphasis on them
- Concurrently and on the same land, continue to apply OM-based technologies while placing greater emphasis on them
- In addition to the familiar manures (crop residues, khola manures), promote use of composts, green manures and agroforestry technologies with wider applicability
- Intensify the planting of vetiver grass on the contour
- Intensify the alignment of ridges on the contour
- Conduct participatory research on various aspects directly related to soil productivity: root/soil/water relations, fertilizer-OM combinations according to agroecological zones (AEZs), water and soil loss, and tillage practices and others
- Intensify promoting those tillage

- practices which enhance soil structure.
- Identify scientifically sound technologies which currently are not being adopted and determine why this is so.
- Provide quality planting materials and seed with regard to agroforestry technologies.

*In the long term*

In the long term, the objective is at least to achieve parity between fertilizers and OM-based technologies as sources of plant nutrients. Otherwise, the preference is for the predominance of OM-based technologies

- Continue undertaking research into aspects which impinge on soil productivity issues as perceived by stakeholders: plant/soil/water relations, performance of different fertilizer-OM-based technologies on different ecological units.
- Characterization of AEZs so as to acquire first-hand knowledge about them, rather than relying on publications whose information is probably too generalized for the degree of intensification of the agricultural activities envisaged.
- To the extent possible, agro-forestry technologies will be developed specific to individual AEZs.
- Water and soil conservation activities to be regarded as integral components of better land husbandry just as applying fertilizer is.
- Insistence on appropriate land use for various AEZs.

**The facilitating component of the action plan:** In order for the technological component of the action plan to work and be adopted, it needs to be facilitated. The following are the key facilitating elements.

- **Policy framework:** A policy framework should be formulated that would ensure that measures and practices for combatting soil degradation are integral parts of normal agricultural activities. Specifically, the application of OM-based sources of nutrients should be made a requirement. The justification for this would be the multiple functions and



benefits of organic matter, and its role in facilitating the proper performance of fertilizers with regards to boosting yields.

- **Adequate resources:** For this or any other strategy to be implemented successfully, adequate financial, and other materials, should be made available to field staff and other staff involved in its implementation.
- **Affordable fertilizers:** In this strategy, fertilizers still have a significant role to play. The government should take steps to make fertilizers available at lower costs (e.g. by manufacturing them locally using raw materials).
- **Technology dissemination:** Complement, rather than replace, proven conventional extension methods with new ones such as innovation platforms, and Farmer Field Schools (FFS). The apparent failure of conventional extension methods may be due to the limited availability of resources to extension staff.

**Priority Cross-cutting Options for the Action plan:** Drivers of soil degradation are complex and interrelated such that they require cross-cutting solutions to be addressed. In this section options for action for enabling conditions for large-scale soil conservation and restoration. Possible policy actions include:

**Broaden the scope of AIP:** The fertilizer subsidy programme has lifted many Malawians from poverty and enabled the country to dramatically improve food security. However, long term plans for the programme must recognize that extensive use of inorganic fertilizers depletes soil and leads to pollution of lakes and rivers. Eventually this could lead to decreased revenues from both agriculture and fisheries. In recognition of this, the programme must be integrated with more sustainable agricultural practices: training farmers in conservation tillage, composting, and intercropping. Proper natural resources will also increase the benefits of this valuable programme.

**Strengthening Implementation of SLM Activities:** Implementation of agriculture and sustainable land management is constrained by a number of issues including limited resource

allocation and human resource capacity constraint, yet these are the sectors that the economy depends on. There are high vacancy rates in most environment and land related departments in particular at field level. There is need to address these issues and also provide adequate training and adequate financial resources to utilize modern technologies for the improvement of land and agricultural productivity through sector wide approach that demands strong national ownership and drive.

**Strengthening Institutional and Human Capacities:** Institutional development involves staff training, acquiring necessary equipment for running of the offices and management of natural resources, formulating and reviewing environmental rules and regulations, national guidelines and standards for sustainable land management.

**Narrow Gender Productivity Gap:** Policy enforcement is necessary to ensure effectiveness and compliance. Sound policies developed through consultative processes have high compliance levels as stakeholders are accountable to its pronouncements. Monitoring ensures that people comply with policy so that actions are taken within the given limits of the statutes. While there are numerous provisions dealing with the environment and natural resources, enforcement is weak, as is evidenced by resultant land and water resources degradation through erosion and water pollution, deforestation, and charcoal burning.

**Research and Development:** Research is necessary to understand natural systems behaviour and changes in ecosystem provisions. Malawian ecosystems are undergoing serious changes due to human activities, and documentation of such changes is necessary to develop tools for sustainable resources management. Currently, the department responsible for land resources has no systematic programme of data collection, processing, and analysis of soil loss and fertility status. This gap has to be closed as the demand for data on soil loss and fertility



level is increasing. Various government and private sector institutions require this data for fertilizer formulations and developing area specific recommendation.

**The Role of Gender:** The importance of gender in sustainable land management is well recognized. Sustainable resources management is possible only with the involvement of all stakeholders, including women and the youth. One of the principles of SLM is that women play a central part in the provision, management and safeguarding of land resources, as such, they need to be engaged in SLM at all levels. Similarly, youth cannot be left out of management programs. They are an emerging force as activists in social, economic and environmental issues. Specific women-focused activities will include the following:

- Sensitize partners, farmers 'groups, and farming households
- Mainstream gender in farming and decision-making
- Assess business opportunities for women and the youth in agro-input supply and marketing, and value addition
- Conduct dissemination campaigns targeting women and young farmers
- Develop labour-saving tools and technologies for women farmers
- Build the capacity of implementing partners and stakeholders at community-, district, and national levels on gender
- Strengthen the capacity to empower women and other disadvantaged groups

**Mainstreaming SLM issues:** Mainstreaming in this brief refers to inclusion or integration of actions related to SLM into economic sectors whose main mandates are not environmental management. The need to mainstream is a complex challenge for Malawi especially considering that the responsibility of managing the environment is fragmented along different government departments and that most significant drivers of environmental change originate from sectors that are not responsible for environmental management. This means that effective implementation of

environmental activities will require bringing aspects of environment into all governance, planning, decision making and operations.

***Improved monitoring of relationships between land management practices and yields:***

Currently the majority of our smallholder farmers do not keep records of their land management practices. Fewer still related practices to the yields they obtained. This identifies a key area in which building farmers' capacity to monitor would be useful and could be supported by public investments in e.g. improved provision of weather or soil information. Improved farmer records of SLM practices, yields and weather (e.g. rainfall) would provide decision makers with a better overview of (both positive and negative) soil quality changes and would strengthen monitoring over the longer term. Farmer reporting could itself be linked to subsidies, where, for example, farmers submit their practices and yields in return for reduced input prices. It is possible that farmers may be suspicious about the use of information, so any fears in this regard would need to be allayed through adequate awareness-raising of the importance and benefits associated with farmer monitoring. In some African countries, experimental work is taking place to monitor farmer decision-making in a cost-effective way using mobile phone technology. This approach could be considered in the Malawian context too.

Comprehensive elements of action plan: To achieve our goal for SLM, effective protection, management and use of our assets and values, and reduction of threats and constraints, this action plan establishes comprehensive policy elements for policymakers to pursue immediately namely:

- Stimulating Community Initiatives in Sustainable Land Management: This intervention focuses on stimulation and upscaling of community initiatives, awareness raising amongst policy makers, development of methodology for upscaling and institutionally embedding SLM initiatives



- Mainstreaming of Sustainable land management activities in national and district programs.
- Enhancing adoption of Climate Smart Agriculture Practices in Malawi's Farming Systems;
- Promote/support operationalization of SLM on a programmatic level;
- Develop an information management system for tracking SLM activities at the national/district level
- Promote/support the development of guidelines for district level bye-laws that incentivize SLM practices
- Establish Soil Testing Laboratories (STLs) and Mobile Soil Testing Laboratories (MSTLs) at district level (Agri-clinics).
- Improving policies and strategies for sustainable land management e.g. National Land Use Planning Policy and Agricultural Land Use and Management Bill.
- Support the development of Nationwide SLM Coordination Unit
- Increase investment in NRM research to provide information that would lead to the development and implementation of necessary SLM interventions

### Final Remarks and Recommendations

Malawi has a relatively strong policy environment for SLM implementation. However, as in many African countries, implementation of the policies and coordination of the relevant stakeholders remains a challenge. The lack of implementation is partly due to insufficient financial resources arising from low national budgetary allocation for SLM. A lack of awareness and capacity to develop competitive proposals also limits access to international funds. The financial situation of Malawi has a direct effect on the institutional framework for SLM in the country. Indeed, the agenda for SLM is mostly driven by international NGOs rather than the national government. This negatively affects the continuity and sustainability of most SLM initiatives, and impairs the development of functional private and public partnerships at national level necessary for enhancing SLM.

A number of challenges also hinder adoption of SLM practices at the farm level. A lack

of knowledge about such practices, lack of relevant inputs, and poor access to both input and output markets, especially on the part of smallholders, are ongoing challenges. Female farmers in particular have low access to and control over agricultural productive resources, technologies, and markets. The bias towards inorganic fertilizer is also a significantly limiting factor to adoption of other important SLM strategies. Weak coordination of SLM activities and projects in the country impedes scaling out of SLM practices. This is despite the presence of a wide range of platforms and alliances in charge of different aspects of SLM, climate change, and resource management.

Nonetheless, there is major potential for enhancing SLM implementation in Malawi. Most of the proposed SLM strategies in relevant policy documents are yet to be implemented. Yet number of SLM options are already being utilized. There is an important opportunity to expand the scope of SLM promoted by government and other actors beyond inorganic fertilizer to include indigenous and farmer knowledge, and SLM practices optimized for different agroecological zones of the country. This action plan aims to strengthen the extension system for more efficient and timely diffusion of accurate and useful agricultural knowledge, products, and services to farmers.

**Policy recommendations:** The analyses of SLM/CSA practices under various scenarios and assessment of mechanisms to support SLM/CSA adoption show that business partnerships with rural communities which build on environmental sustainability as business strategy, farmer field schools to enhance community-based learning and technology dissemination, and participatory integrated landscape management approaches seem promising and profitable mechanisms to support the development of a productive, resilient agriculture sector. These can be supported by several policy actions:

- Build business partnerships with rural communities, in which agribusinesses promote the adoption of sustainable land management practices, provide environmental certification and leverage



payment of ecosystem services finance; thereby providing smallholders with capacity building, access to markets, and finance

- Pluralistic Participatory Extension Approach—Supporting Linkages Between Research and Dissemination: The pluralistic participatory extension (PPE) approach harnesses different sources of advisory services to disseminate innovative technologies.
- Farmer Field Schools—Strengthening Community-Based Learning and Technology Adoption Farmer field schools (FFS) provide education and extension services often with a focus on SLM/CSA practices. FFS have emerged as a complementary and reinforcing approach to traditional agricultural advisory services and provide season-long programs for farmers to regularly meet, learn, and experiment with particular topics
- Integrated Participatory Landscape Management Approaches—Achieving Multiple Goals: The landscape management approach entails planning interventions at a larger geographic

level, such as a watershed, catchment or communal area, and is planned through a participatory land management method.

- Cash Transfers—Alignment with the Harvesting Cycle to Promote SLM/CSA: Cash transfers provide infusions of capital as an incentive to invest in agriculture, and can be rolled out in combination with SLM/CSA practices. In tandem, cash transfers address the bottleneck caused by high upfront costs of many SLM/CSA practices and also enhance the resilience of the rural poor. Evidence suggests that cash transfers can also increase agricultural production and self-sufficiency.
- Gender-Sensitive Supply Chains—Facilitating Access to Assets and Services for Women: The development of gender-sensitive supply chains offer women access to the same markets and resources as men.
- The promotion of SLM/CSA must be customized to suit Malawi’s specific agroecological conditions
- Promote/support operationalization of SLM on a programmatic level



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