# Unlocking the Development Potential of Drylands: Lessons from Ethiopia and Uganda

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Printed in South Africa

April 2014

**Design and layout:**
Terrence Reddy

**Printing**
Seriti Printing

NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

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# United Nations Development Programme (UNDP)

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The UNDP Drylands Development Centre is a unique global thematic centre that provides technical expertise, practical policy advice and programme support for poverty reduction and development in the drylands of the world. The Centre's work bridges between global policy issues and on-the-ground activities, and helps governments to establish and institutionalize the link between grassroots development activities and pro-poor policy reform. The main areas of focus are mainstreaming of drylands issues into national development frameworks; land governance; making markets work for the poor; decentralized governance of natural resources; and drought risk management.

http://www.undp.org/drylandscentre

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# I. Acknowledgments

This publication is a synthesis of the lessons learned and key best practices from the implementation of the United Nations Development Programme's (UNDP) Integrated Drylands Development Programme (IDDP) in Ethiopia and Uganda. In Ethiopia, the IDDP supported the development and implementation of the Afar Integrated Dryland Management Project (AIDMP) and in Uganda, the mainstreaming and implementation of Sustainable Land Management activities in six cattle corridor districts.

The publication was possible due to the involvement of a number of people who were directly and indirectly involved in its development and production. We are particularly thankful to the national consultants who prepared the initial country reports that underpin this publication: Goshu Worku in Ethiopia and Edward Nector Mwavu in Uganda. We would like to express our deepest appreciation to the UNDP Country Offices in Ethiopia and Uganda who provided substantive contributions, technical and administrative support to these consultants. Special mention goes to Takele Teshome, Sinkinesh Beyene, Shimelis Fekadu and Ababu Anage, UNDP Ethiopia; Onesimus Muhwezi, Sarah Mujabi, Paul Mwambu and Robert Nabanyumya, UNDP Uganda. Also acknowledged with thanks are the contributions of Stephen Muwaya, from the implementing partner and the UNCCD National Focal Point, Ministry of Agriculture, Animal Industry and Fisheries, Uganda.

We also acknowledge and thank the following: Afar Environmental Protection, Land Use and Administration Agency (EPLUA), respective field officers and focal persons at the district level in all five project districts and AIDMP beneficiary communities from Dewe, Mile, Chifra, Ewa, and Awra Weredas, Elema Abubeker, General Director, EPLUA Afar Regional State, Ethiopia. Members of the farmers' groups in the Districts of Kamuli (i.e., BANDERA 2000, Kamuli District Farmers' Association, and Buyindi Farmers' Eye (BUFE), Kaliro (i.e.,WACIDI, Twali Banafu Farmers Association, and Green Environment Development Initiative), Nakaseke (i.e., Kyasaga Community Based Farmers Organization), and Nakasongola (i.e., Tusubira Womens Group; Tubasaliza Kisalizi Women's Group, Agency for Interregional Development, and the Nalukonge Community Initiatives Association); District SLM Coordinators of Nakaseke, Kamuli and Nakasongola Districts, Uganda.

Our special thanks goes to Anaga Dalal who synthesized the country-specific inputs into one coherent document. Special thanks also goes to the United Nations Development Programme - Drylands Development Centre (UNDP-DDC) IDDP Africa team, Sarah Anyoti and Zithobile Kolweni for their substantive inputs, insights and guidance in this publication process.

The UNDP-DDC gratefully acknowledges the financial support provided by the Royal Norwegian Government, Ministry of Foreign Affairs to produce this document.

# II. List of Acronyms

| | |
|---|---|
| **AIDMP** | Afar Integrated Dryland Management Project (Ethiopia) |
| **ANRS** | Afar National Region State |
| **BoFED** | Bureau of Finance and Economic Development |
| **CA** | Conservation Agriculture |
| **CBD** | Convention on Biological Diversity |
| **CRGE** | Climate Resilient Green Economy |
| **DA** | Development Agent |
| **DDP** | District Development Plans |
| **DEAP** | District Environment Action Plans |
| **EPLUA** | Afar Environmental Protection, Land Administration and Use Agency |
| **EWS** | Early Warning Systems |
| **GHG** | Greenhouse Gas Emissions |
| **IDDP** | Integrated Drylands Development Programme |
| **IPS** | Integrated Package of Services |
| **KM** | Knowledge Management |
| **MAAIF** | Ministry of Agriculture, Animal Industry and Fisheries (Uganda) |
| **MDGs** | Millennium Development Goals |
| **MoFED** | Ministry of Finance and Economic Development (Ethiopia) |
| **NAP** | National Action Plans to Combat Desertification |
| **NARL** | National Agricultural Research Laboratories (Uganda) |
| **NARO** | National Agricultural Research Organization (Uganda) |
| **NEMA** | National Environment Management Authority (Uganda) |
| **NDP** | National Development Plan (Uganda) |
| **PARDB** | Pastoral Agriculture and Rural Development Bureau (Afar Regional State, Ethiopia) |
| **PARDO** | Pastoral Agricultural and Rural Development Offices (Ethiopia) |

| | |
|---|---|
| **PMU** | Project Management Unit |
| **SLM** | Sustainable Land Management |
| **SWC** | Soil and Water Conservation |
| **TBFA** | Twali  Banafu Farmers Association |
| **UNCCD** | United Nations Convention to Combat Desertification |
| **UNDP** | United Nations Development Programme |
| **UNDP-DDC** | UNDP Drylands Development Centre |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **WACIDI** | Walwawo Community Integrated Development Initiative |
| **WDCD** | World Day to Combat Desertification |

# III. Executive Summary

Drylands are challenging environments where human ingenuity, knowledge systems, and the careful use of natural resources are essential for survival. Over the years, communities and farmers in the drylands have developed strategies to maintain the quality and quantity of these scarce resources in the face of rapidly changing socioeconomic and environmental conditions. But an increasingly variable climate coupled with unprecedented population growth, particularly of young people, is sure to intensify the problems of limited access to natural resources.

Drylands include arid, semi-arid and dry sub-humid lands and cover more than 41 percent of the earth's land surface. They are home to 2 billion people, many of whom depend on the natural resources, biodiversity and agro-biodiversity of these lands for all aspects of their livelihood including food, water, fuel and building materials.

In the drylands, there is more livestock in arid areas and more cropland in dry, sub-humid areas. Pastoralism, however, remains the most widespread land-use system in the drylands. Mobile pastoralism in the drylands provides a highly efficient way of managing the sparse vegetation, relatively low fertility of drylands soils and extremely high seasonal variability of rainfall. It is estimated that drylands rangelands support about 50 percent of the world's livestock. Beyond pastoralism, drylands have great economic and ecological potential, including products such as gum Arabic, gum talha, frankincense and myrrh, medicinal plants such as aloe vera, biofuels such as Jatropha, and more.

Even though most agricultural production in the drylands is seasonal and subject to the challenges posed by land degradation, highly volatile climatic variability and water scarcity, these areas also offer opportunities. According to the Consultative Group on International Agricultural Research, the drylands of sub-Saharan Africa harbour great cultural and biological diversity, which are valuable resources for building sustainable rural livelihoods. Indeed, some 44 percent of the world's cultivated systems are in the drylands. Furthermore, high-yielding agricultural production has been linked to improved access to farming inputs including certified seeds, knowledge, appropriate technology, access to markets and the adoption of improved agricultural practices.

Both Ethiopia and Uganda have a large percentage of drylands so their development is highly dependent upon the efficient and effective use of these areas.

In Ethiopia, the drylands are situated in the regions of Somali, Afar, Southern Nations, Nationalities and Peoples Regional State, Benishangul-Gumaz and Gambella. This accounts for nearly 70 percent of Ethiopia's total land mass, which is primarily inhabited by agro-pastoralists and pastoralists who occupy 46 percent of the country's total arable land. The climate in the Ethiopian drylands is characterized by low and erratic rainfall and very high temperatures, along with sparse and barren vegetation in some places. These areas are extremely vulnerable to land degradation and cyclic droughts, which are likely to increase in frequency given the likelihood of continued climatic change.

Uganda has an extremely varied set of habitats within a relatively small area. Between the wet forest and grassland mosaics to the south around Lake Victoria, and the arid grasslands in the northeastern area of Karamoja, there is a semi-arid transition zone across the centre of the country, known as the cattle corridor (drylands). This corridor covers many districts stretching from Moroto and Kotido in the northeast through Nakasongola, Luwero and other districts in the central region to Masaka, Sembabule and Mbarara in the southwest of the country. The Cattle Corridor covers approximately 84,000 square kms, receives an annual average precipitation of 450-800 mm which supports livestock and accounts for some 90 percent of the national cattle herd, and rain-fed agriculture. Despite the large numbers of cattle, poverty indicators show that the drylands constitute a severe poverty hotspot (UNDP Human Development Report, 2005).

Since 2002, UNDP's Integrated Drylands Development Programme (IDDP) has assisted governments, civil society and local communities in the drylands to build and strengthen their capacity for sustainable natural resources management as a basis for building resilience, reducing vulnerability and improving livelihoods. The IDDP's resilience-building efforts are guided by the three key principles on which UNDP bases its work: improving people's lives by empowering individuals and communities and reducing inequalities and marginalization; establishing or strengthening institutions, structures, and human capacities to ensure long-term impacts and sustainability; and commitment to long-term partnerships and national ownership.

The IDDP is managed by the UNDP Drylands Development Centre and implemented through the UNDP network of country offices in line with the National United Nations Development Assistance Frameworks and the UNDP Country Programme Action Plans. The IDDP is operational in 17 countries in Sub-Saharan Africa and the Arab States. Ethiopia and Uganda are two of the 17 countries implementing the IDDP.

The development initiatives discussed in this document—the Afar Integrated Dryland Management Programme (AIDMP) in Ethiopia, and Sustainable Land Management (SLM) Mainstreaming in Uganda—represent an innovative and rich set of strategies that can be applied across many development contexts, and provide the perfect test cases for creating successful drylands development policy.

Both programmes were funded solely by the Government of Norway. The initiative was developed as part of the IDDP, to complement TerrAfrica[1]. It provided an opportunity for improved mainstreaming of the National Action Plans to Combat Desertification (NAP) into national economic development frameworks and for mobilizing investments to implement Sustainable Land Management Programmes at local levels in African Country Parties. The overall objective was to facilitate poverty reduction and attain the Millennium Development Goals (MDGs) in Ethiopia and Uganda through scaled up and harmonized support for Sustainable Land Management approaches and initiatives.

In Ethiopia, the IDDP has supported the development and implementation of the Afar Integrated Dryland Management Project. AIDMP has been implemented in the following five woredas or districts of Afar regional state: Dewe, Mile, Chifra, Ewa and Awra. The programme goal is to improve the livelihoods of resident pastoral communities by enhancing their capacity to sustainably manage and use natural resources through the implementation of Climate Change Adaptation Programmes. These woreda-level programmes identified key issues that a redesign of the AIDMP took into account while maintaining its original outcomes and outputs. In summary, AIDMP has developed the structural and technical capacity of residents at the regional and woreda levels to manage drylands in an integrated fashion and in response to changing environmental and socioeconomic conditions. This has resulted in better coordination and cross-sectoral collaboration among various governmental bureaus and the improved implementation and delivery of services. Another outcome has been the adoption of various sustainable drylands management practices and livelihood diversification approaches that attempt to strengthen the resilience of communities to the challenges of land degradation and climate change.

In Uganda, the IDDP supported the mainstreaming of Sustainable Land Management (SLM) activities into district and local development plans and budgetary systems and contributed to the identification and implementation of priority SLM interventions to improve the livelihoods of local communities in six cattle corridor districts. In summary, the programme has built capacity in respect to aspects of SLM at the national, district, community and farmer level. On the national level, the IDDP built and strengthened

[1] TerrAfrica is a partnership between sub-Saharan African countries, donor countries and agencies, civil society and the research community which aims to scale up harmonized support for effective and efficient country sustainable land management (SLM) approaches. As such, TerrAfrica will contribute significantly to the achievement of MDGs in Africa. UNDP and the Government of Norway are members of the TerrAfrica Initiative which will support the Integrated Package of Services (IPS) process. TerrAfrica is anchored under NEPAD Comprehensive African Agricultural Development Programme (CAADP) which has SLM as one of its pillars.

the capacity of the UNCCD National Focal Point in the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) to coordinate SLM activities at the global, national and local levels. This resulted in the development of a SLM Country Strategic Investment Framework (SLM-CSIF), the establishment of a national Interministerial Steering Committee, Technical Working Group of the five participating sectors, and a Sector Working Group that includes a CSO representative to operationalize the CSIF. This has enhanced capacity in integrated planning approaches and resulted in the development of cross-sector SLM projects to be managed as a single portfolio. Uganda Rangeland Development and Management Policy was also developed as a result of this support. At the district level, the IDDP enhanced the capacity of district staff and equipped them with the knowledge and skills to manage the environment action planning processes, which resulted in the development of Parish, Sub-country and six District Environment Action Plans that capture SLM issues and the integration of environmental and SLM issues in six District Development Plans. At the community level, 1195 small holder farmers learned how to implement activities using SLM technologies and approaches such as conservation agriculture, apiculture, agro-forestry, rangelands and livestock management, to help them adapt to variable climates, declining soil fertility and water scarcity.

Some of the most pressing lessons learned in both countries include the following:

- Greater information sharing among and beyond community members;
- Greater emphasis on watershed management activities and gully rehabilitation;
- Use of alternative building materials such as mud bricks;
- Use of alternative energy sources such as solar panels;
- Use of traditional methods for rangeland management and conservation;
- Use of needs-based criteria for the selection of project sites;
- Mainstreaming of SLM issues into District Development Plans and Budgets;
- Adoption of sustainable livelihood and land management practices by local communities in the cattle corridor;
- Ensuring timely, representative and participatory consultations with all stakeholders; and
- Capacity enhancement for the UNCCD/NAP focal point and inter-ministerial committee on SLM to manage SLM country programmes.

This report has brought to light the many innovative and sustainable ways the world's most arid lands can turn the hopelessness of its people into optimism focused on the future. The specific agricultural strategies borne from the drylands can be replicated anywhere. They are ultimately based on a conservation mindset, respect for traditional methods and a commitment to involving the local community. The ultimate benefit of this sound policymaking extends beyond the locals who directly benefit from these policies to development practitioners worldwide who can adapt and scale the methods of the drylands to their lands.

Despite the wide range of achievements from successfully implemented initiatives, more work needs to be done to strengthen the capacity of drylands communities to anticipate, manage, recover and transform their livelihoods as a result of socioeconomic and ecological stresses and shocks.

In the past decade, many drylands communities, especially small holder farmers, have faced difficulty in responding effectively to the impact of extreme climatic events which are increasing in frequency, duration and extent. Responding to the impact of climate variability and change requires a building-up of the adaptive capacity of drylands countries and communities and the strengthening of their ability to cope with the increased vulnerability of changing and variable climates. These adaptive measures are now essential to sustaining the resilience of drylands communities in response to a changing environment.

It is also critical to tap into the unrealized potential and opportunities in the drylands to help local or rural communities and farmers obtain long-term, sustainable development. Some of the areas that need to be targeted include but are not limited to the following:

- Strengthening the adoption of Sustainable Land Management approaches, practices and technologies. This will not only lead to a restoration of the land's productive potential, but also increase the resilience of the small holder farmer and enable them to adapt to climate variability and change, ensure food security and environmental conservation.

- Build and strengthen the capacity of drylands farmers to sustainably manage vulnerable land and water resources.

- Reduce pressure on already stressed natural resources through developing and implementing alternative livelihoods strategies and options.

- Promote access to and the use of sustainable and renewable energy to protect the environment.

- Promote access to markets as a basis for enhancing livelihoods.

- Promote peer networks between communities, farmers, countries and regions through South-South Cooperation to enable the sharing of lessons learned, experience, and the adoption and transfer of working approaches and technologies.

- Support policy dialogue and advocacy to ensure that lessons learned, the knowledge gained and the needs of drylands communities as identified during programme implementation are adequately mainstreamed into policy processes and long-term national development planning frameworks and strategies.

*Fodder Bank, ChifraWoreda, Afar Regional State, Ethiopia (AIDMP)*

# IV. Introduction

Drylands are defined by water scarcity and characterized by seasonal climatic extremes and unpredictable rainfall patterns. The rural residents of drylands are primarily dependent on natural resources and fuel provision for survival. Contrary to negative perceptions of drylands as waste lands, they effectively contribute to poverty alleviation and economic growth; they provide crop and rangeland resources, forest products and minerals; and they offer great potential for large-scale energy sources such as wind and solar power. The drylands ecosystem also supports a wide range of biodiversity, hosting many endemic animal and plant species. They are the original home of a range of food crops including sorghum, millet, maize, groundnuts/peanuts, soya beans, cowpeas, cassava, sweet potatoes, and some vegetables. The drylands also offer great potential for both ecotourism and cultural tourism as they are associated with unique wildlife species and habitats, historical and religious sites, and diverse tribal cultures. Mobile pastoralism in the drylands provides a highly efficient way of managing the sparse vegetation and relatively low fertility of drylands soils. It is estimated that drylands support about 50 percent of the world's livestock. Beyond pastoralism, drylands also have great economic and ecological potential, including products such as gum Arabic, gum talha, frankincense and myrrh, medicinal plants such as aloe vera, and biofuels such as Jatropha.

Poverty poses the greatest challenge to the drylands. Despite the proven correlation between poverty levels and drylands, most development funds are invested in what are considered to be high potential areas. The scant public and private sector investment in the drylands is directly related to unsupportive development policies, restrictive legal frameworks and weak institutional capacities. Add to this the physical challenges of poor infrastructure such as roads, lack of markets, limited access to information and communication technologies (ICT), and the end result has been the marginalization of drylands communities in mainstream development.

The development prospects for the drylands are further complicated by the larger context of climatic change and variability. Today, climate change is acknowledged as one of the most pressing threats to development. Moreover, it is predicted that climate variability and change will continue to impact the drylands heavily, resulting in an increasing number and intensity of extreme weather events from droughts to floods, and the diminishing availability and quality of water. Rising temperatures and changing precipitation patterns may also result in the expansion of land degradation in drylands worldwide, and reduce their overall agricultural productivity. Under this scenario, the possibilities of sustainable livelihoods from crop and animal production will become limited, affecting food security and the health of drylands communities.

The Integrated Drylands Development Programme (IDDP) is the framework programme through which the United Nations Development Programme—Drylands Development Centre (UNDP-DDC) supports programme countries for the implementation of the United Nations Convention to Combat Desertification (UNCCD) and other drylands development programmes.

The IDDP has supported the Governments of Ethiopia and Uganda to implement activities in support of National Action Plans to Combat Desertification (NAP) in line with the key principles of TerrAfrica. TerrAfrica is a partnership between sub-Saharan African countries, donor countries and agencies, civil society and the research community that aims to increase coordinated support for effective and efficient Sustainable Land Management (SLM) approaches on the country level. As such, TerrAfrica will contribute significantly to the achievement of Millennium Development Goals (MDGs) in Africa. UNDP and the Government of Norway are members of the TerrAfrica Initiative which supported the Integrated Package of Services (IPS) process.

The funding complemented and supported ongoing consultations and activities related to the engagement of the two countries in the TerrAfrica Initiative. It also supported policy reviews, dialogue

and policy development, and the up-scaling of previously-supported pilot programmes on the ground in the two countries.

In Ethiopia, the funding has supported the Afar Integrated Dryland Management Project (AIDMP). The AIDMP is an expansion of the Mile Project implemented from 2006 to 2008 in Afar National Region State (ANRS). These two projects are part of Ethiopia's contribution to the implementation of the United Nations Convention to Combat Desertification (UNCCD).

In Uganda, TerrAfrica funding has supported the mainstreaming of Sustainable Land Management (SLM) activities into district and local development plans and contributed to the identification and implementation of priority SLM interventions to improve the livelihoods of local communities in six cattle corridor districts. It also supported the strengthening of the capacity of the UNCCD national focal point in the Ministry of Agriculture, Animal Husbandry and Fisheries, Uganda to coordinate SLM activities at the global, national and local levels and the UNDP Country Office to deliver on the programme outputs and outcomes.

Furthermore, the programme has supported sharing information and experiences within and between countries through the full documentation and dissemination of lessons learned and best practices in different fora.

The two country situations that have been analyzed for this report—Ethiopia and Uganda—share several objectives and offer uniquely valuable lessons to the broader development community. The lessons from Ethiopia and Uganda prove that drylands communities have developed many innovative and sustainable ways to adapt to their harsh environment. Their approaches, practices and technologies have served them well over the years in the world's most arid lands. The specific agricultural strategies borne from the drylands can be replicated anywhere. They are ultimately based on a conservation mindset, respect for traditional methods and a commitment to involving the local community. The ultimate benefit of this sound policymaking extends beyond the locals who directly benefit from these policies to development practitioners worldwide who can adapt and scale the methods of the drylands to their lands.

### *Structure of this Report*

This report begins with an Executive Summary, followed by this Introduction. It goes on to provide a detailed description of the United Nations Development Programme (UNDP) Integrated Drylands Development Project (IDDP), then takes a closer look at first Ethiopia and then Uganda in terms of their respective country contexts, their IDDP programming and key aspects of their project implementation. A discussion of shared and individual lessons learned follows, with a summary of key messages and recommendations afterward. A Conclusion ends the report with two Annexes to follow: A list of works cited and referenced, and country maps of Ethiopia's Afar Region and Uganda's cattle corridor district. The Acknowledgments and a list of Acronyms precede the Executive Summary.

*Buyanga Sanitation Group, Lyantonde District, Uganda (SLM Project)*

# V. UNDP and the Integrated Drylands Development Programme

UNDP initiated the Integrated Drylands Development Programme (IDDP) to assist governments, civil society and local communities in the drylands to build and strengthen their capacity for sustainable natural resources management as a basis for building resilience, reducing vulnerability and improving livelihoods. The IDDP's resilience-building efforts are guided by the three key principles on which UNDP bases its work: improving people's lives by empowering individuals and communities, and reducing inequalities and marginalization; establishing or strengthening institutional structures and human capacities to ensure long-term impacts and sustainability; and a commitment to long-term partnerships and national ownership.

The programme is being managed by the UNDP Drylands Development Centre (DDC), a thematic centre of excellence that helps countries fight poverty and promote development aimed at reducing vulnerability and building resilience in the drylands. The DDC works with UNDP Country Offices in Africa, the Arab States and West Asia to implement the UNCCD. It provides support services for programme development and implementation, policy advice, capacity building, resource mobilization, building partnerships, and knowledge management.

The IDDP was launched in 2002, and is currently in its second phase of implementation. The IDDP combines policy analysis, institutional capacity building and concrete interventions on the ground to support three outcomes:

i. Mainstreaming drylands issues, climate change adaptation and mitigation into national policies, planning and development frameworks, and contributing to the effective implementation of the UNCCD;

ii. Reducing the vulnerability of drylands communities to environmental, economic and sociocultural challenges (such as climate risks, drought, land degradation, poor markets and migration) and building their adaptation and mitigation capacity; and

iii. Improving local governance, management and the utilization of natural resources.

The IDDP supports countries in implementing the UNCCD as a pathway towards achievement of the Millennium Development Goals (MDG) in the drylands. A critical element of this work is integration of the needs of drylands populations into national planning processes and economic development frameworks, including National Poverty Reduction Strategies. This requires strengthening national and local capacities for planning, developing and implementing drylands programmes. It also involves establishing effective networks, partnerships and funding resources for implementing and monitoring drylands development interventions.

Some of the results that can be seen from the IDDP activities include the following:

1. Drylands and environmental issues have been mainstreamed into development frameworks at the national and local levels (including provincial and district) in 17 countries;

2. Community capacity has been improved with regard to livelihood enhancement and diversification;

3. There is greater community resilience to climatic shocks and corresponding socioeconomic stresses;

4. There is better management and decentralized governance of land and natural resources;

5. Policy advocacy has been promoted on land governance issues, and national and sub-regional capacity has been developed in land and agrarian reform processes;

6. Peer learning networks have been established across communities, countries and regions, offering opportunities for cross-fertilization of approaches, and knowledge sharing to transfer information, experiences, and technologies through South-South cooperation;

7. Global advocacy and outreach has been undertaken to improve people's understanding of the relationships between environmental conditions and livelihood possibilities for drylands communities;

8. Awareness of the productive potential of the drylands and their contributions to national GDP has been promoted through evidence-based policy advocacy targeted towards decision-makers and designed to ensure that the identified needs and priorities of drylands communities are adequately integrated into policy deliberations and long-term drylands development planning processes; and

9. Partnerships have been built and catalytic funding mobilized for the implementation of programme activities in 17 countries.

One important aspect of the IDDP's work is to promote the establishment of peer learning through human networks across communities, countries and regions that can be used to facilitate the exchange of experiences, knowledge sharing, and the adoption of technologies based on South-South cooperation. The premise is that improving people's understanding of the relationships between environmental conditions and the livelihood possibilities for drylands communities–emphasizing the productive potential of these areas–will lead to better decision-making, policies, and legal and institutional frameworks for the sustainable development of drylands. Face-to-face peer learning through study tours or exchange visits, forums and workshops and active electronic platforms allow people and groups in different countries to identify, document and share lessons, experiences, best practices and successful interventions. The evidence-based knowledge generated within the IDDP not only allows people to learn from each other, and transfer and adapt best practices and technologies that are working, it can also be used to inform policy development, decision-making processes, and budgetary allocations relating to drylands areas, as well as to create tools for policy advocacy and guidelines to support effective programming and implementation.

**The overall goal of IDDP** is to contribute to poverty reduction through the sustainable development of drylands leading to reduced vulnerability and improved livelihoods. The IDDP:

1. Targets marginal areas (arid, semi-arid, and dry sub-humid) and communities affected by desertification, drought and land degradation, where poverty is the highest.

2. Works at national, sub-national and local levels helping countries and communities to build capacity for integrating drylands issues into planning and development frameworks and budgetary systems.

3. Uses an integrated approach that combines three approaches to drylands development: policy analysis with institutional capacity building and concrete programme interventions at national and local levels.

4. Works to ensure that the drylands potential is reflected in policy-making processes in the programme countries and translated into livelihood options.

5. Applies policy analysis to guide the design and implementation of participatory actions at the community level.

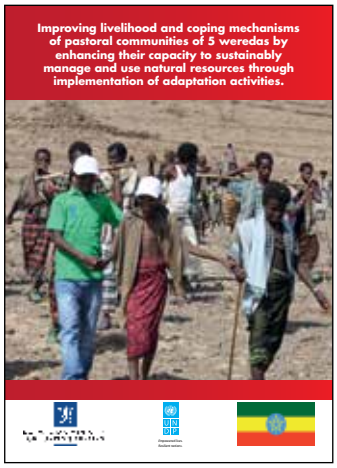
6. Focuses on building the resilience of drylands communities to shocks, including drought, climate variability, climate change and socio-economic stresses and is thus a good vehicle to promote synergy in the implementation of both the Desertification (UNCCD) and Climate Change (UNFCCC) Conventions and Convention on Biological Diversity (CBD).

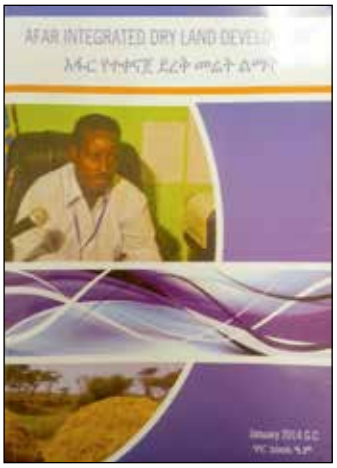
7. Places emphasis on the productive potential of drylands and its people and supports activities on sustainable land management practices/approaches/technologies that helps to restore the land's productive potential and small holder farmers better adapt to short-term climate variability and long-term climate change thus mitigating the impact to their livelihood.

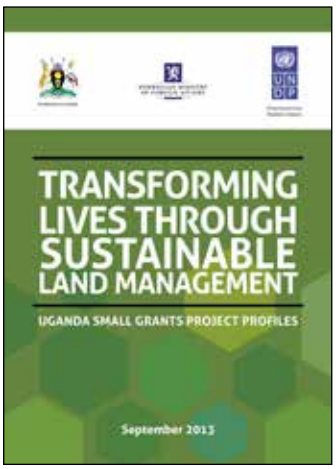
8. Promotes livelihood enhancement activities using market-based approaches in recognition that limited market access for commodities produced by pastoralists and agro pastoralists is a major constraint to sustainable livelihoods in the drylands.

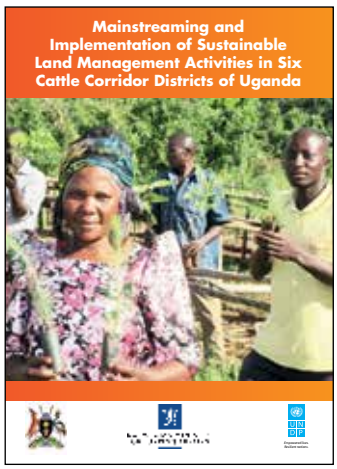
9. Promotes knowledge management and peer-to-peer learning, experience sharing and technology transfer through South-South cooperation.

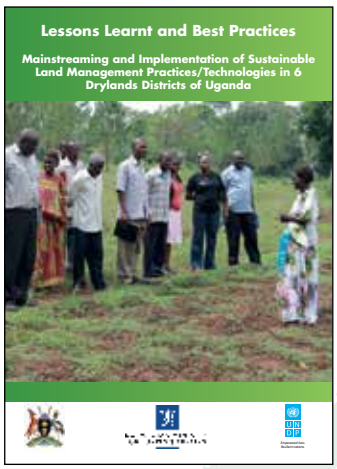
10. Builds partnerships and mobilizes resources to support drylands programmes.

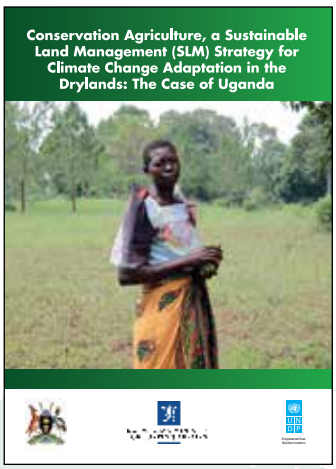



*Advocacy Products*

# VI. Ethiopia: A Closer Look

## a. Country Context

Located in the eastern horn of Africa, Ethiopia is home to an estimated population of more than 84 million, with a total surface area of 1,104,300 square kilometers. The gross domestic product in 2012 was estimated to be USD 41.61 billion, with Gross Domestic Product (GDP) per capita of USD 380 for the same year. The poverty index, which tracks the population below the national poverty line, is estimated at 29.6 percent of the population. The key economic activities are shared by the agricultural sector (which hosts more than 80 percent of the total population and 47.7 percent of GDP), the industrial sector (which is in its infancy, covering 24.3 percent of GDP with manufacturing covering 5.2 percent) and the service sector (which shares 30 percent of the GDP).

Ethiopia suffers from drought and climate change-induced impacts, in which the vulnerability to climate change impact is a function of several biophysical and socioeconomic factors. The mainstay of the country, agriculture, is entirely dependent on the onset season, amount, duration, and distribution of rainfall, but critically undermined by drought and climate change.

Ethiopia has developed a land management strategy (National Conservation Strategy), which has been fine-tuned to regional contexts, different methodologies for environmental management, soil and water conservation and land use policies. The five year Ethiopian Growth and Transformation Plan (GTP, 2010 -2015) was launched in 2010 and explicitly addresses the sustainability of growth, with a special emphasis on the vital role of environmental conservation. Building a green economy and the ongoing implementation of environmental laws are among the key strategic directions to be pursued during the plan period (GTP, 2010). At the same time, the Government of Ethiopia has launched a Climate-Resilient Green Economy (CRGE) strategy to reduce the adverse effects of climate change and to build a green economy that will help realize its ambition of reaching middle income status by 2025. The green economy plan is based on four pillars: improving agriculture, the protection and development of forest, renewable sources of energy, and modernizing and energy-efficient transportation and industrial systems.

The Afar Regional State conducted a study on the overall regional situation at, regional, zonal and district levels. Following the detailed situation assessment, the region developed a Climate Change Programme of Action at two levels, which addresses the pastoralist community and the dryland development options. All five project districts conducted a detailed situation assessment and each developed a district-level Climate Change Programme of Action. This helped to sharpen the AIDMP focus on addressing the core problems and challenges faced by target communities.

There are approximately 625,000 square kilometers of pastoral land in Ethiopia. This is 57 percent of the country's total area and a little more than half (52 percent) falls in Afar Regional State. Ethiopia is a habitat for more than 120 threatened species with a forested area of 12.6 percent of land area. The 2008 estimated energy consumption per capita in the country was 29 kilograms of oil. Ethiopia is a country exercising federalism as the fundamental political system organized in seven regional states and two city administrations, or councils.

*The Afar Region and Target Districts*

The Afar Regional State is located in the northeastern part of Ethiopia. The region, with an area of about 270,000 square kilometres (Central Statistical Agency ((CSA)), 2008) is situated between 39o34' and 42o28' East Longitude and 8o49' and 14o30' North Latitude. The region shares borders with Tigray Region in the northwest, Amhara Region in the southwest, Oromia Region in the south, and Somali Region in the southeast. It also shares international boundaries with Djibouti in the east and Eritrea in the northeast. Administratively, the region is divided into 5 zones and 32 Districts. The total

population of the region is estimated to be 1,411,092, where 80 percent of the rural communities are classified as pastoralists and the remaining 20 percent agro-pastoralists (CSA, 2007). The major livelihood of the rural community in the region is livestock rearing, which accounts for about 90 percent of work with limited irrigation agriculture along the river basins and low-lying riverine areas. The Afar community engages in subsistence livestock production for its economic, social and cultural values.

The climate of the region is characterized as arid and semi-arid. It remains dry and hot throughout the year. The lowland kola zone covers 99.335 percent of the region with average annual temperatures ranging from 23 to 33°C with the hottest months reaching up to about 45°C. The region gets very little, irregular and erratic rains in two rainy seasons - karma (main rainy season), and sugum (short rainy season), bimodal throughout the region with average precipitation of 150 - 500mm/annum. This makes crop cultivation very difficult.

The AIDMP implementation has been carried out by the Afar Environmental protection and land use Administration Agency/ EPLUA in collaboration with technical and administrative support from the UNDP country office - Ethiopia, federal EPA and Ministry of Environment and Forest (MEF). Other collaborative implementing partners at the regional level are: Bureau for Finance and Economic Development (BOFED), Afar Regional State Small Enterprise and Micro Enterprises Development Office, Afar Pastoralist Development and Agriculture and Afar Water Resource Bureau.

### b. Overview of the Afar Integrated Dryland Management Project (AIDMP)

In Ethiopia, the IDDP has instituted the Afar Integrated Dryland Management Project (AIDMP). It is a larger scale version of a pilot project implemented in Mille district (Afar Region of Ethiopia) during 2006 – 2008, which was known as Mille Integrated Dryland Management Project. The AIDMP has been implemented in five woredas (districts) of Afar Regional State, namely, Mille and Chifra Districts of Zone 1, Ewa and Awra Districts of Zone 4 and Dewe District of Zone 5. All five districts share a similar natural resources base, the same livelihood and the same climate. The location map is presented in the Annex.

AIDMP is focused on building and strengthening the adaptive capacity of Afar people by implementing Climate Change Adaptation Programmes. The Project is also expected to contribute to the country's Sustainable Land Management Programme under the framework of TerrAfrica. The project was aligned with specific UNDP Country Programme Action Plan (CPAP) Outcomes relating to, "Enterprises and communities, particularly women, able to access alternative energy, adapt to climate change and sustainably use natural resources for productive purposes". The AIDMP is one aspect of Ethiopia's implementation of the United Nations Convention to Combat Desertification (UNCCD).

### c. Key Activities in Project Implementation

The AIDMP has four expected outputs that are detailed below along with related accomplishments.

In summary, the AIDMP was expected to:

1. Contribute to building the regional Climate Resilient Green Economy (CRGE) platform, which is comprised of stakeholders from the Federal, Regional, Woreda, and Civil Society levels working in regional and UN organizations in ANRS.

2. Assist Afar communities in strengthening their resilience to the challenges of land degradation and to maintain and diversify livelihoods in difficult environmental conditions that are increasingly exacerbated by changes in weather patterns and changes in the Afar social fabric.

3. Provide feedback through action learning to improve Regional and Federal government policies, programmes and plans on pastoralist dryland management, and, strengthen resilience-building to the urgent national and global environmental pressures of desertification, climate change impacts and biodiversity loss.

4. Contribute to building an economy which has a modern and productive agricultural sector with enhanced technology and a productive industrial sector that can together increase the per capita income and advance the country to middle-income status.

5. Help build coalitions between various community members and woredas to strengthen the management of natural resources through the formulation of an Environmental Action Plan at the community level.

Key activities implemented by AIDMP with related accomplishments are as follows:

*Output 1: Institutional Support for Integrated Dryland Management*

Built project management capacity: The AIDMP established project management units and thereby strengthened the capacity of project implementation partners. This included the establishment of offices, the recruitment of project coordinators and field officers and the establishment of project management units. The newly established Afar EPLUA and the five implementing districts required intensive financial and material support. A project management unit with two staff was established at the Afar EPLUA Regional Office in Semera and in all project districts (five staff) within the Pastoral Agriculture and Rural Development Offices (PARDO). This helped facilitate the scaling up and the smooth implementation of project activities. Both the regional and district Project Management Units (PMU) offices were equipped with office furniture (including tables, chairs, shelves, filing cabinets, and office equipment such as desktop computers, printers, scanning machines, photo copiers), five motor bikes for the five districts and a vehicle for the regional staff for day-to-day operations and the field monitoring of activities.

The project also established regional- and district-level steering committees and technical working groups consisting of relevant experts from different government bureaus to provide guidance. This resulted in increased coordination and cross-sectoral collaboration between the different bureaus, including Women, Youth and Children's Affairs, Office of Cooperatives Promotion, Office of Education, Office of Health, Office of Water Resources, Mine and Energy, Office of Pastoral Agriculture and Rural Development (PARDO), and Office of the District Administration and the bureaus of the same sectors plus Afar EPLUA at the regional level. The regional management committee is chaired by the president and the secretary is Afar EPLUA and the District management committee is headed by the District Administrator with the head of PARDO acting as Secretary. The regional technical committee has been lead by Afar EPLUA and by the district PARDO.

Additionally, a CRGE Platform was established in all the selected project kebeles through the organizing of a local support group, and during general community gatherings. This helped to create consensus and enhanced awareness of the project within communities. Kebele-level development committees were also established and community management plans prepared with full support from the district technical committee and agreed upon by kebele representatives. This also enhanced the implementation of the project activities.

*Coordinator AIDMP making presentation on the programme, Afar Regional State, Ethiopia*

*Capacity built for integrated vector management:* One of the major impacts of climate change on human health is the creation of favorable conditions for the reproduction of vectors and disease-causing microorganisms. To help community health workers in the fight against the spread and impacts of vector-borne diseases, AIDMP facilitated the training of 30 community health workers (5 females and 25 males) to manage and control vectors and vector borne-diseases.

*School environmental clubs established to raise community awareness:* the project has been implemented in communities that are largely fragile, degraded and have limited awareness about the impact of climate change. To raise community awareness about these issues, the AIDMP has supported the establishment of 17 school environmental clubs replete with tree seeds and gardening materials. Volunteer groups were organized to preserve the environment through the development and conservation of natural resources.

*Livestock market centre established:* With technical support from the regional PARDB, one livestock market centre was constructed in Awara project district to address the lack of competitive and accessible rural markets in Afar. The market centre will also provide the following services: compartments for separating livestock by type, a water trough, shelter, a vaccination station and animal drug store, market information board, toilet for herders, taxing office, loading and unloading track, weighing scale and other local amenities. Pastoralists in Afar normally sell livestock products and livestock to local and domestic markets through both formal and informal channels. In contrast to crops (where crop failure due to drought results in price increases) livestock destocking, in response to drought, results in a price decrease because the market is flooded with poor quality animals. This has highlighted the importance of fixed marketplaces, which are critical for economic growth. Policies to build market infrastructure, institutions and regulations in the drylands can be explicitly designed to reach low-income populations. The establishment of these markets will help improve livelihoods for pastoralists by allowing them to sell quality livestock before they suffer from weight loss, secure better prices for livestock, and travel shorter distances to find buyers.

### *Output Two: Promoting Sustainable Drylands Management Practices*

For this output, some of the activities that have been implemented include the introduction and promotion of alternative energy sources and alternative construction technologies, watershed management activities, and related actions as detailed below.

Promotion of alternative clean energy sources: The conventional development path, which results in a sharp increase in Green House Gas Emissions (GHG) and the unsustainable use of natural resources, must be replaced by environmentally friendly development strategies that result in sustainable growth. Ethiopia's green economy directive can help to realize this vision. For instance, the AIDMP has helped communities use solar energy for electricity. Solar panel systems were provided to five health centres, which otherwise used gasoline as an energy source to help support human vaccination efforts and refrigerate medicines that can be dispensed at any time of day. Consequently, health centers have been able to provide service around the clock. This has improved the performance of the institutes and reduced the health-related risks of pastoralists. With the full support of the programme, a significant proportion of the communities have been trained in the use, management and maintenance of the solar electrification system, which will lead to a sustained use of the system.

In areas where schools and health centres are in close proximity to each other, schools have the opportunity to use electricity from health centres for teaching and mini-media purposes. Given the success of this intervention, additional solar panels have been installed in 3 additional health centres and in 5 schools. Rural schools equipped with solar panels, television and VCD/DVD can establish a study center for school children and promote community dialogue and adult literacy. These initiatives will double the value of solar panels. The use of solar panels for rural energy needs can also be integrated with the regional settlement programme. This technology could eventually provide a type of subsidy that could help to support social infrastructures and dwellings.

*Community Mobilization and Capacity Building for Watershed Management*

The Afar community's indigenous knowledge of natural resources management has been deteriorating over time. To revitalize traditional resource conservation practices of the community, the AIDMP supported the assessment, documentation and subsequent revitalization of pastoral indigenous practices by a Regional Task Force comprised of a group of senior experts (from Semera University, Afar Pastoral and Agro Pastoral Research Institute and Afar EPLUA). The findings of the assessment informed some of the natural resources management activities of the AIDMP.

Communities were mobilized as a cornerstone of the project implementation process. For this purpose, 45 (8 female and 37 male) Development Agents (DAs) and district experts, were trained on community mobilization in collaboration with PARDB, and secured the commitment of local communities.

The AIDMP also supported experience sharing study tours between community representatives, DAs, and experts at district and regional levels. The experience sharing visit was held in the neighboring Werebabo district of Amhara region, this helped the project implementation base itself upon best practices. Similarly, to ensure the effective implementation of natural resource conservation practices, 50 (10 females and 40 male) DAs and district experts were trained on technologies and techniques of soil and water conservation and management, in collaboration with PARDB.

*Soil and water conservation activities promoted:* The condition of drylands can be significantly improved by better and integrated management of the natural resources base. Approaches to the management of scarce resources include erosion control, water harvesting techniques, water storage and conservation measures, afforestation to arrest soil erosion, improving ground water recharge, and intensifying agriculture using novel technologies that do not increase pressure on dryland water and soil. Under this component, the AIDMP successfully supported communities to undertake soil and water conservation activities, and watershed management activities.

Physical soil and water conservation structures implemented in the 5 districts included the construction of 250 km soil and stone bunds and a variety of water retention structures (trenches and half-moon structures). As part of the conservation activities, gabion reinforced river bank stabilization and gully reclamation activities were also achieved, and will be further reinforced in the near future by the planting of vetiver grass, jatropha plant, fodder trees and grasses and sesbania and neem trees.

*Construction of Physical Soil and Water Conservation Structures, AIDMP, Afar Regional State, Ethiopia*

Approximately half of the community in the project Woredas participated in the soil and water conservation activities. Half of the community in the project Woredas reported that, as a result of this work, many were convinced of the importance and benefits of combating the life-threatening situations caused by climate change and are likely to continue the work on their own after the programme intervention ends. The participation of women in these activities was also exceptional. Some catchment areas such as Bolotom of Chifra District are now fenced and protected and provide lessons for others. In many sites, water harvesting trenches have already started harvesting runoff water and gabion checkdams were filled with soil material, proving that the trenches are retaining water and the gullies are rehabilitating. Future work will include the protection and maintenance of the constructed activities, proof of the quality of the structures, the maintenance of the structures after heavy rains, and the protection of the structures from roaming livestock.

*Promotion of biological soil and water conservation:* The biological water and soil conservation measures that have been implemented include the planting of multipurpose trees (fodder trees, forage trees, grasses and fruits). This depends on rainfall, and has been implemented in protected areas.

*Introduction of solid mud bricks as an alternative housing material:* Mud brick houses are being used to stem the degradation of forest resources. Each of the five project areas in Ethiopia were given mud-brick molds and training for their use. Although mud bricks are not new to Ethiopia, members of the Afar community were new to the method, which subsequently grew in popularity with increased demand for the molds following thereafter. Bricks made of mud, which can be produced locally by any individual, are good construction materials, with ecological, economic and social advantages compared to the construction of wooden houses. The specific advantages of mud brick construction include a lessening of deforestation, an economical and low cost approach to construction that involves a reduction in material and labour costs by at least half, a more durable structure as compared to wooden homes, built-in temperature controls since the mud naturally cools dwellings in the high-temperature zones that persist throughout Ethiopia, and built-in fireproofing.

*Rehabilitated rangelands:* In pastoralist areas, there are a range of factors that lead to the overgrazing of vegetation and soil resources in the sensitive drylands. Most of the environmentally harmful effects of livestock production in dry areas occur around local water points and settlements. Grazing reduces soil cover and changes the composition of the vegetation. Both heavy and light grazing can reduce the density of palatable perennial species, which are replaced by less palatable vegetation. In turn, this affects the resilience of pastoralists during drought cycles and climate change. Pastoralists generally employ traditional enclosures of rangelands for in-situ conservation and the rehabilitation of vegetation, which is a dry-season fodder reserve. This is an indigenous practice that has been revived

by the AIDMP. This system alleviates dry season fodder shortages and prevents land degradation by reducing soil erosion and deforestation. This helps to enhance livelihoods and provide a vital safety net during dry seasons and droughts.

Grazing areas were closed off to prevent animals from roaming on rangelands and to preserve these lands for use during droughts. More than 100 hectares of land have been closed off from the interference of animals, and the grasses are being fed to animals on a cut and carry system, or with a controlled grazing technique, depending on the preference of individual pastoralists. In some sites, the closed areas are strengthened with soil and water conservation activities and will be over-sown with improved forage grasses and planted with multipurpose tree species. Communities came to a consensus on activities to protect rangelands. Management bylaws were adopted and violators of rangelands will be beholden to the local laws and new bylaws. At the same time, these areas were cleared of invasive trees such as Acacia nubica (locally named as Gerento), Prosopis and Parthenium to allow beneficial plants to grow comfortably, and enable the regeneration of grasses. Accordingly, more than 50 hectares of rangelands were cleared of the invasive plants. The programme also trained 230 male and 90 female pastoralists in revitalizing traditional methods of grazing techniques.

*Improving livestock production and productivity:* Training was given to 30 community animal health workers known as para-vets at 15 kebeles (all men). The para-vets were also provided with full veterinary kits and drugs to assist pastoralists in the project districts. Fodder banks, which are known as forage multiplication areas were also established for the multiplication of different forages for distribution to the community for use during forage deficit times of the year. Five fodder banks have been established near perennial rivers, with some showing very good performance. Alfalfa, Panicum and Rhodes grass have been grown using irrigation methods and in some sites grasses were distributed to pastoralists. Some of the fodder banks have already served for one season and are under reinstatement for another season.This clearly shows that the improvement in the production and productivity of livestock can be accomplished through improving feed supply conditions (where rangeland management is the main discussion point in drylands) and the health condition of the livestock. The supply of water for livestock is another key factor (not discussed in this report) in improving livestock contributions for pastoral communities.

*Water supply and sanitation improvement introduced:* Among the different impacts of climate change, a shortage of drinking water is the very first and most serious problem in all the kebeles of the project districts. The project has constructed 20 hand dug water wells, fitted with hand pumps. The shallow wells were utilized to do the following:

- Reduce the risks of fetching water particularly for women who might otherwise be required to endure the hardship of walking long distances and risking their safety when doing so;
- Reduce the time required to fetch water, giving women ample time for their business work and fulfilling their responsibilities to family members;
- Improve the health and thereby the productivity of family members who were otherwise left to drink from unprotected and unhealthy river water sources;
- Improve family health and ensure that school-age children are well enough to attend school;
- Reduce conflicts due to water use; and
- Reduce the health condition of animals in the villages and possibly improve the costs related to veterinary care.

Ten roof water harvesting structures have also been established for schools. The harvested water is intended for students and teachers at school, domestic use and for school-based gardening. Consequently, 9 tanks of 3000 litres each, have been distributed to the selected schools.

*Output 3: Support for Livelihood Diversification Activities*

In this category, the emphasis has been on supporting a variety of income generation activities, including crop production. Some of the other activities include the promotion of irrigation, trainings on entrepreneurship and marketing, and group formation.

*Small Scale Irrigation Schemes Developed:* As in many areas of the world and specifically in Ethiopia's Afar Region, pastoralists are experiencing increased rainfall variability and an increase in average temperatures. Rainfall periodically declines, which means there is less water in rivers and it will take longer to recharge groundwater aquifers. The total precipitation has dramatically decreased, and usually occurs in a shorter period of time, which extends dry spells. The higher temperatures lead to greater water requirements for plants. This necessitates more water storage in the village.

In Afar, a few small scale irrigation schemes are supporting the livelihoods of agro-pastoralists. The AIDMP is supporting crop production through the proper use of existing rivers through the implementation of maintenance programmes for existing irrigation structures and the construction of new irrigation schemes at two of the target districts. One new irrigation structure has been constructed and the older scheme maintained; both schemes are expected to serve the development of 90 hectares of land for crop production.

*Alternative income sources promoted:* As part of livelihood diversification, the project supported community awareness trainings on microfinancing techniques. The trainings were delivered by district project coordination units in collaboration with district cooperative promotion offices, where 275 community members (50 percent female) were in attendance.

Basic skills training was provided for different techniques including for handicrafts, with 10 community members (7 males and 3 females) in attendance. Following the needs assessment and strategy development in collaboration with Afar Micro and Small Enterprises Coordination Agency on the identification of the type of marketable skill, training was organized at Lucy Technical Vocational and Education Training (TVET) College in Worer. The training components were carpentry, plumbing, masonry, electric installation, wood and metal work. The attendants included 90 youths and women.


*Beneficiary of Basic Skills Training with his certificate, AIDMP, Afar Regional State, Ethiopia*

Five savings and credit associations in the five target districts were also established, and managers for these groups received training. The groups were also provided with technical assistance, material support for such items as an official group stamp and documentation requirements. Financial support in the form of seed money has been provided to establish a revolving credit fund that can be availed

by microcredit business owners, including those involved in improving the value of milk production. Business skills training including value chain development for milk products have been provided to 30 beneficiaries.

*Output 4: IDLM Communication and Information Dissemination*

As the impact of climate change is multidimensional, the AIDM Project mainly focuses on addressing the problems through integrated activities by involving different concerned stakeholders and the full and active participation of the community. But community awareness of AIDMP was negligible. Therefore, to increase the awareness level of the community and broaden information dissemination about the Programme, five information boards have been procured and distributed to the five project districts. EPLUA also produced and widely distributed different print materials, including 14,000 brochures, 5000 posters, 2500 environmental club establishment guidelines, 200 hats and 200 t-shirts. Information sharing is also being promoted through the use of information boards.

*Assessment of existing regional early warning system:* The early warning system that exists in the region is weak and incapable of adequately warning the population prior to the occurrence of a disaster and the related hazards. An assessment of the early warning system's challenges and constraints has been conducted. The findings emphasized a need for training the respective bureaus and offices. Accordingly, training was provided to district and regional early warning committee members. The expectation is that there has been an improvement in the capacity for local responsiveness to weather-related disasters both before and after an incident.

Despite its achievements, the AIDMP also faced challenges that resulted in long delays that negatively impacted the efficient delivery of its outputs. These included structural and institutional changes in the focal implementation partners. At its inception, AIDMP was under the management or implemented by the Pastoral Agriculture and Rural Development Bureau (PARDB). However, the Afar Region reorganized itself and established in 2011, the Afar Environmental Protection and Land Use and Administration Agency (EPLUA). The implementation of AIDMP was thereafter transferred to EPLUA. This resulted in a long bureaucratic process to regulate the project's bank account. A new project account had to be established under the new Agency as the old one could not be used to transfer resources for the implementation of activities. Furthermore as a newly established Agency, EPLUA did not have the institutional structure nor the required capacity (human resources, materials, equipment, etc.,) to effectively deliver on its responsibilities. This also resulted in long delays as capacity had to be built from scratch. This included supporting and strengthening the Agency with trained manpower (a full coordination unit was established at the regional level with three project staff) within EPLUA and at the woreda level (PCU offices have been established with five field officers per woreda) within the Pastoral Agriculture and Rural Development Offices). In addition, both the regional and Woreda PCU offices were set up with equipment.

In 2011, AIDMP also faced a late budget release. The annual budget of the project was released at the end of the third quarter which hindered the implementation of activities as per the planned schedule. This was caused by delays in the finalization and approval and endorsement of the 2011 work plan. Furthermore, some delays occurred due to the absence of wholesalers in the region who could provide materials and supplies for project activities. This greatly impacted the speed with which AIDMP was able to procure materials for project activities.

Sustainability: The proper implementation of the programme objectives outlined above have proven to have a long-term, sustainable impact. The policy changes mandated by this project can play a constructive role in mainstreaming climate change adaptation and mitigation options into development plans, key sector policies and strategies. Those programme activities that have successfully addressed the core challenges of beneficiary populations have inspired them to actively participate in programme execution and has engaged people in self-development efforts that provide them with a sense of ownership in the outcome of those efforts.

# VII. Uganda: A Closer Look

## a. Country Context

Uganda's drylands are a dry belt (popularly known as the cattle corridor) stretching between the country's northeastern and southwestern borders encompassing 84,000 km$^2$ (about 43 percent) of the country's total land area of 241,550 km$^2$, and more than 40 districts. This constitutes a large part of Uganda's land resources that are critical to national development and human well-being, since they support agriculture, human settlements, industrialization and important infrastructure. Although Uganda receives 700-3,000 mm/year of rainfall, the cattle corridor rainfall is irregular and averages 1350mm per year.

In spite of their fragile nature, Uganda's dryland ecosystems have an immense scientific, economic and social value; are rich in biodiversity and support the livelihoods of its residents (CCD Secretariat, 1997; Reynolds et al., 2007). They are a unique ecosystem that provides a unique set of ecosystem services to support the country's economic development and the environment. Like other savannas in sub-Saharan Africa, they are vitally important in providing both ecological (e.g., erosion protection, microclimate) and economic services (e.g., timber, food, fodder, medicine, non-wood products, and wildlife habitats) that sustain local livelihoods and national economies (Luoga et al., 2000; Shackleton, 2002; Kristensen & Lykke, 2003; Pote et al., 2006). Uganda's cattle corridor supports about 90 percent of the national cattle population, mainly kept by pastoral and agro-pastoral communities (UNDP 2009). Despite the large numbers of cattle, the drylands constitute a severe poverty hotspot (UNDP Human Development Report, 2005).

In Uganda, poverty is widespread, with national poverty levels currently estimated at 24.4 percent, and the number of people living in poverty constituting nearly one-third of the country's population of 32.9 million (UBOS 2011). Within the cattle corridor, poverty rates are highest in eastern and northeastern Uganda, with up to 80 percent of the population living below the poverty line in some areas (UBOS & ILRI 2004). Their livelihoods and options for economic development are based on natural resources utilization and directly linked to the quality of the land and its resources. Indeed, in these drylands, livelihoods and human well-being depend on biodiversity just as they depend on ecosystem services[2]. Most of the households depend directly on important and often unique ways of a wide array of goods and services provided by these ecosystems for their livelihoods, such as food, fodder, fibre, medicine, the provision of clean water and protection against erosion (MEA, 2005). Given the fragile nature of dryland ecosystems, the livelihood strategies pursued by dryland communities are equally fragile, calculative and dynamic. Hence, the task of fighting poverty within these communities with long-lasting results is unavoidably linked to the sustainable management of land resources.

The cattle corridor belt constitutes the catchment system for Lake Kyoga, and the trans-boundary water bodies such as the River Nile. It is also the habitat to a diverse group of wildlife. At the turn of the century, the cattle corridor was home to a diverse group of wild animals, ranging from large ungulates to butterflies. These are of global environmental benefit as they contribute to biodiversity and carbon sequestration. They are also catchments of the trans-boundary waters.

Stress associated with climate variability is a daily reality in dryland ecosystems; and climate change[3] is a threat to the delicate biophysical and sociocultural systems characteristic of drylands. Indeed the dryland areas are the most vulnerable to the impacts of climate change with the increasing frequency

[2] Ecosystem services are the benefits that people obtain from ecosystems. Up to 18 such services are conventionally recognized, falling into four groups namely provisioning services (i.e. food production and fresh water) regulating services; cultural services (recreation and ecotourism); and supporting services (i.e. habitats/refugia, soil formation and nutrient recycling) (Pereira & Cooper, 2006).

[3] Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. Weather is the state of the atmosphere, to the degree that it is hot or cold, wet or dry, calm or stormy, clear or cloudy.

of droughts and floods threatening crop productivity and human well-being. The dryland household livelihoods are considered to be highly vulnerable[4] to climate variability and changes related to the widespread poverty, low adaptive capacity and high levels of dependence on natural resources. Since the provisioning of ecosystem services depends to varying degrees, on particular components of biodiversity, household livelihoods in the cattle corridor are therefore vulnerable to biodiversity losses and habitat changes as a result of climate change.

Across the world, drylands are particularly sensitive to land degradation (MEA, 2005), and are threatened with desertification. Desertification is most pronounced in the drylands of the cattle corridor where sustainable land management is threatened by overgrazing by local and mobile pastoralist herds, deforestation by excessive use of wood for fuel, and poor and inappropriate agriculture on marginal land. The resultant land degradation, in these areas is characterized by decreasing vegetative cover often resulting in bare soil with no or low regeneration capacity, and severe runoff. This often results in an overall loss of ecosystem integrity and productivity; forcing people to move elsewhere (UNDP, 2009). Land degradation continues to remain an important regional and global issue because of its adverse impact on agricultural production, the environment, and its effect on food security and the quality of life. Indeed, in Uganda about 97 percent of the land area suffers from human-induced land degradation (Banadda 2010), resulting in an estimated 4-12 percent of GNP loss due to environmental degradation of which 85 percent is from soil erosion, nutrient loss and the forced switching to lower value crop varieties (Olson & Berry 2003).

Hence, dryland degradation is a serious obstacle to eradicating extreme poverty and hunger, and is jeopardizing efforts to ensure environmental sustainability; and dryland degradation and competition over increasingly scarce resources can bring communities into conflict. There is increasing pressure on natural resources in the cattle corridor from over-usage, partly driven by a population increase. It is estimated that nine percent of the land is lost annually to land clearing (Lufafa, 2006; Kalema, 2011). Uganda's human population (about 33 million) with a growth rate of 3.4 percent per annum (UBOS 2011) is increasing the pressure and competition for scarce land resources. This often leads to their unsustainable utilization. These increases in human population as well as the increasing demand for biomass energy (particularly firewood and charcoal) and a greater quest for prosperity are leading to unsustainable land use practices and land cover changes, particularly in the fragile cattle corridor environments. Landuse and cover change analyses in this area within the previous decade indicate decreasing woodland cover as a result of charcoal production and land conversion to ranches and crop agriculture (see Mwavu & Witkowski, 2008; Kalema, 2011). Indeed, charcoal has become an increasingly traded commodity, leading to the harvesting of valuable dryland tree species such as *Vitellaria paradoxa, Tamarindus indica, Acacia senegal* and *Balanites aegyptica* with a potential for adoption in food systems and pharmaceutical development. Consequently such socio-economically valuable trees are threatened with local extinction.

*Grace Kyomugasho, 67, uses bio gas at her home in Kashaka Village, Lyantonde district, Uganda (SLM Project)*

[4] Vulnerability may be defined as the ability or inability of individuals and social groupings to respond to, in the sense of coping with, recover from or adapt to, any external stress placed on their livelihoods and well-being (Boko et al., 2007).

Presently the cattle corridor belt of Uganda faces the inter linked challenges of climate change and variability, land degradation, desertification, and a loss of biodiversity. The linkage between climate, land degradation and loss of biodiversity are increasingly viewed as highly interactive, requiring a more holistic framework and approaches in order to solve common problems that impact human well-being (MEA, 2005). These converging view points lead to an increased focus on sustainable land management (SLM)[5] and development whereby incomes of the poor can be increased but not at the expense of the natural resources base and the environmental services they provide. There is a need to develop SLM systems because of the enormous pressure on land resources, particularly in developing countries like Uganda, arising from increasing population and the need to improve nutrition standards (Lefroy et al., 2000). The sustainable management of land resources is necessary to meet the present and future needs of this increasingly natural resources-based population, particularly in the face of the possible impact of climate variability and change. It requires the integration of technologies, policies, activities in the rural sector, particularly agriculture in such a way as to enhance economic performance while maintaining the quality and environmental functions of the natural resource base. An important aspect of SLM as an approach to land management is that it is not just concerned with output, but encompasses the need for long-term preservation of the resource base to allow adequate future food production in a manner that is socially acceptable, economically viable and environmentally sound (Lefroy et al., 2000).

The development prospects in dryland regions of developing countries like Uganda are especially dependent on actions to avoid the degradation of ecosystems and slow or reverse degradation where it is occurring. In this regard the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) has implemented a project titled "Mainstreaming sustainable land management activities in six cattle corridor districts of Uganda."This project attempted to address the problem of severe land degradation in the cattle corridor districts of Uganda, which has led to reduced land productivity resulting in abject poverty and other socio-economic hardships in the six selected districts of the cattle corridor: Nakasongola, Nakaseke, Sembabule, Lyantonde, Kamuli and Kaliro. The project aimed to "contribute to sustainable land management and enhance the livelihoods of local communities in the drylands of Uganda" (UNDP, Mainstreaming and Implementation of Sustainable Land Management Activities in Six Cattle Corridor Districts of Uganda, PRODOC, 2009).

Sustainable dryland management is, however, often constrained by a number of factors or barriers that include knowledge management. The documentation of lessons learned and best practices under the SLM project was crucial to managing knowledge for project areas and their stakeholders. Identifying and sharing best practices enabled beneficiaries to learn from others and to reuse knowledge. The effective sharing of best practices might help project implementers to identify and replace poor practices, avoid starting from scratch and save money by ensuring greater productivity and efficiency.

[5] Sustainable land management is "a system of technologies and /or planning that aims to integrate ecological with socio-economic and political principles in the management of land for agricultural and other purposes to achieve intra and intergenerational equity" (Dumanski, 1994; Hurni, 1996).

*Farmer David Muhoozi with his crops, Conservation Agriculture under the SLM Project, Uganda*

### b. Overview of the Mainstreaming of Sustainable Land Management Activities in Six Cattle Corridor Districts of Uganda

Uganda's drylands (i.e., the Cattle corridor) cover 84,000 km$^2$ (about 43 percent) of the country's total land area. Although these lands are fragile in nature, they are a major socio-ecological production landscape. This landscape is vitally important in providing both ecological and economic services that sustain local livelihoods and national economies. Nevertheless, they are faced with the challenge of climate change and variability, severe land degradation, desertification and loss of biodiversity, which are highly linked and threaten local livelihoods. Therefore, the development prospects in these areas are especially dependent on actions to avoid, reverse or slow ecosystem or land degradation and avoid desertification. This requires Sustainable Land Management (SLM)[6].

The Ministry of Agriculture Animal Industry and Fisheries (MAAIF), has implemented a project titled: "Mainstreaming SLM activities in six cattle corridor districts of Uganda", namely; Nakasongola, Nakaseke, Sembabule, Lyantonde, Kamuli and Kaliro. The project aimed to improve management of the drylands through improved policy implementation, mainstreaming of environmental concerns into the district development planning processes, and an enhancing of sustainable livelihoods in dryland communities. The project also supported interventions that apply SLM principles and practices while promoting growth and wealth creation among 24 community-based organizations in the selected six cattle corridor districts. It fostered synergies between improved livelihoods and SLM. To this end, it employed SLM technology transfer as well as support for farmer innovations to harness the indigenous skills, knowledge and practices of local farmers and resource users, whilst accounting for gender balance and equity. The project promoted and supported activities that complement the work programme priorities of the UNCCD, UNFCC, NDP 2010 and CBD. The SLM project has offered

[6] Sustainable Land Management is an adoption of land use systems that through appropriate management practices, enables land users to maximize economic and social benefits from the land while maintaining or enhancing ecological support functions of land resources.

a triple-win strategy to mitigate and adapt to changing and variable climates, alleviate poverty, and improve household food security among dryland households. Hence, it has contributed to the attainment of some of the targets of Millennium Development Goals One and Seven, both of which are aimed at improving human well-being. However, effective ecological and biological monitoring programmes where the monitoring activities are carried out by the resource or technology users themselves will be crucial to the understanding of the success of SLM activities within the project areas. The Mainstreaming Sustainable Land Management (SLM) project was developed to contribute to the UNDP Country Programme Action Plan (CPAP) outcome, which states that "Enterprises and communities, particularly women, are able to access alternative energy, adapt to climate change and sustainably use natural resources for productive purposes" (UNDP, Country Programme Action Plan 2006-2010 for Uganda).

The main project objectives were: (i). to support mainstreaming of SLM issues into District Development Plans (DDPs) and budgets; (ii). to support the adoption of sustainable livelihood and land management practices by local communities in the cattle corridor districts; and (iii). to strengthen the United Nations Convention to Combat Desertification (UNCCD) and National Action Plan (NAP) Focal Point Office in the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) department in implementation of the National SLM Investment Framework.

### c. Key Activities in Project Implementation

Uganda's Mainstreaming SLM Project identified the following three outputs and related activities.

Output 1: Integrate SLM priority interventions in the DDPs and budgets of selected districts in the cattle corridor.

- Develop Sub-county Environment Action Plans (SEAPs) and District Environment Action Plans (DEAPs) in the Districts of Lyantonde, Nakaseke, Kamuli and Kaliro.
- Integrate priority SLM issues including climate change adaptation issues in Sub-County Development Plans (SDPs) and District Development Plans (DDPs) of six districts and selected sub-counties.
- Strengthen the capacity of the districts for SLM monitoring and decision-making through appropriate support tools and systems.

Output 2: Identify and implement SLM priority interventions by local communities in six target districts.

- Identify, prioritize and pilot local community livelihood interventions on SLM.
- Undertake integrated research on termites.

Output 3: Empower the UNCCD/NAP Focal Office and the Interministerial committee on SLM to manage SLM Country Programmes

- Support Project Management Unit (PMU) to implement the UNDP DDC project component.
- Strengthen the capacity of the UNCCD/NAP Focal Point in MAAIF to coordinate SLM activities at global, national and local levels.
- Strengthen the SLM Interministerial committee and the Country Strategic Investment Framework (CSIF).

There have been various achievements under the SLM Mainstreaming Project. Policy related achievements include the following:

i) The Sustainable Land Management Country Strategic Investment Framework (SLM-CSIF) was developed. An SLM platform and Interministerial National Steering Committee, a Technical Working Group of the five participating sectors, a Sector Working Group that includes a representative of Civil Society Organizations, were established and operationalized.

ii) SLM was mainstreamed into national development frameworks such as National Development Planning, Agriculture Sector Development Strategy and Investment Plan (DISP).

iii) A Rangelands Management and Pastoralism Policy was developed.

iv) SLM was mainstreamed into district-level development and planning frameworks through Environmental Action Planning Processes - Sub-County Environment Action Plans (SEAP), Parish Environment Action Plan (PEAP), District Environment Action Plan (DEA), and District Development Plans (DDPs).

v) Districts are now prioritizing and beginning to allocate funding for SLM actions.

vi) Bye-laws have been drafted in the lower local governments such as Kaliro District, to:

- Control animal grazing in Namwiwa Sub County, Bumanya Sub County and Kaliro Town Council;
- Control deforestation in Namugongo and Bumanya Sub Counties; and
- Promote proper fishing methods in Nawaikoke and Gadumire Sub Counties.

Community-related achievements include using a Small Grants Scheme to address and minimize the impacts of climatic variability, land degradation and drought on drylands' famers and communities.

The programme devised and applied the concept of small grants to support rural community-based organizations within the six cattle corridor districts to implement activities that address and minimize the impacts of climatic variability, land degradation and drought. This supported the already existing, rural, community-based organizations within the six cattle corridor districts in areas that complement sustainable land management.

The SLM Small Grants Scheme (SLM -SGS), was designed as a quick win development tool that aims to achieve the second project output on supporting communities to address priority SLM issues in their localities, and generate lessons that can be shared with other communities in the drylands of Africa, and to implement community-level activities that would result in the increased adoption of SLM practices and technologies in the cattle corridor.

Under the scheme, 24 community based farmers' groups with at least 3 from each of the districts (in total 1,806 farmers, 942 (52.2%) female and 864 (47.8%) male) were supported with funding and technical backstopping to implement community-level activities that resulted in the increased adoption of SLM practices in the cattle corridor. The key problems addressed by these groups revolve around land degradation and loss of livelihoods, and they include declining soil fertility, water scarcity for human and livestock use, lack of grazing pastures, deforestation, overgrazing, invasive plant species, and decreasing livelihood options. Indeed most of the groups' activities are aimed at improving land productivity and providing alternative livelihood options to improve the well-being of group members in terms of household income, health and food security. To this end, the SLM project supported the use of various technologies in the energy sector (e.g., improved cooking stoves, bio-char), conservation agriculture (e.g., L-trenches, basins and stones lines), and livestock husbandry (e.g., zero grazing, night kraal).

The SLM - SGS grantees have had their capacity built in financial management, monitoring and evaluation, reporting, knowledge management and some aspects of general management. Under the SLM project, women have been empowered in different areas that include leadership, marketing and security. For example, in most of the grantee groups, women are the majority and in high positions of leadership. Furthermore, by training women to make hay to feed the animals that remain at home and are often taken out at night to graze has helped some women in Nabisweera sub-county, Nakasongola District to avoid the dangers that might come with being out in fields late at night.

The implementation of the SLM project has increased cohesion among the participating groups and their ability to work together on the realization that it is only through joint efforts that they can improve their livelihoods. The communities have acquired more knowledge and skills in conservation agriculture, financial management, records keeping through the various workshops and training provided by UNDP and the PMU in MAAIF. This has enabled them to practice modern farming, increasing productivity per unit area and improving their household livelihoods.

*Farmers demonstrating Conservation Agriculture -mulching techniques, Walwawo Community Integrated Development Initiative, Uganda (SLM Project)*

Conservation Agriculture (CA) was promoted as one of the sustainable land management technologies for climate change adaptation in the drylands; and to cater to reduced land available for agricultural production. Some of the common best practices under CA implemented by farmer groups include the following: i). the use of planting basins, ii). water harvesting, iii). mulching, and iv). minimum tillage through the use of herbicides. At first, the practice of digging basins was not well received among the communities as it was perceived as a waste of time because it was labour intensive and deviated from the traditional way of pitting for maize and bean planting. However, this perception has changed after a few seasons of high productivity per unit area. This suggests that a technology is more likely to be neglected, however environmentally good it may be, if it does not bring immediate visible and

tangible returns for those who practice it. Members of the BANDERA2000 farmers' group are quoted as saying:

> "Non-members have now realized that we get high maize yields than they do because we use basins; and this has caught the attention of many people even at the sub-county as they continue to visit our gardens to see what we are doing. Some people think that we are using witchcraft in our crop production."

The people who do not belong to the community-based groups which are beneficiaries of the SLM Small Grants component now have heightened interest in conservation agriculture and other SLM practices, and are demanding assistance in understanding and executing the techniques. Proper sharing of SLM techniques requires farmer-to-farmer learning opportunities, exchange visits, access to local radio programmes, and distribution of training/educational materials such as technology charts in local schools and administrative areas. Taking SLM to another level in these districts calls for more sensitization of district leaders about the value of SLM.

The promotion of peer learning has increased the level of adoption and transfer of technologies and practices between farmers and communities. The promotion of farmer-to-farmer learning through exchange visits has enabled farmers to learn by doing, resulting in peer demonstrations of better land management practices. This has been promoted in the six cattle corridor districts where selected local communities and farmer groups in each of the districts have been supported to conduct at least one cross visit to each other.

Advocacy undertaken and awareness raised on the UNCCD, significance of dryland ecosystems and their contribution to sustainable development through celebrations such as the World Day to Combat Desertification on 3 - 5 August 2012.

The capacity of drylands districts to make decisions and help their communities plan adaptive measures to deal with stresses associated with climate variability and change is being built through the collection, documentation, analysis and later dissemination of climate data to the areas and communities where weather data was collected. This has been possible because the national Meteorology Department has installed 36 rain-gauges, and operationalized the rainfall data collection and transfer system from the districts to the Meteorology Department headquarters for analysis and dissemination.

Knowledge of drylands issues has been shared and experiences exchanged between countries through South-South cooperation study tours to Namibia and South Africa. The Namibia study tour focused on sustainable land management and rangelands management, livestock issues, conservation agriculture, natural resources-based enterprises and the use of biomass for the production of energy.

The South Africa study tour focused on: (i).knowledge of policy elements and practices associated with differences in land tenure systems, natural resources endowments and access to technologies by the land users; (ii). management approaches implored at different levels to enhance the adoption of user-friendly technologies in light of subsistence production in a largely water-stressed environment; and (iii). management of natural resources-based enterprises, particularly the utilization of simple technologies for agro-processing and how the dairy industry is organized. The study tour also addressed issues on wetlands and biodiversity conservation.

To broaden cooperation among African countries and share lessons learned, Uganda has hosted study tour teams from the Common Markets for Eastern and Southern Africa (COMESA), focused on Conservation Agriculture as a Climate Smart Agriculture strategy. Key areas of learning during the study tours are technologies and practices of Conservation Agriculture applied in the programme that include among others, minimum tillage, minimum harvest, planting basins, mulching, agroforestry, soil and water conservation structures and early planting.

Uganda also hosted the study tour team from the Kilimanjaro Tanzania Sustainable Land Management Project to share its lessons learned and experiences on the integration of SLM priority interventions in District Development Plans; development and implementation of SLM priority interventions by rural communities; implementation of Conservation Agriculture and small scale irrigation; and implementation of bio-gas projects.

Most of the farmers' groups attribute success in the implementation of their project activities to the various trainings and knowledge exchange visits they have had; the direct transfer of funds; timely technical backstopping, and monitoring from the PMU at MAAIF. The implementation of the SLM project has also had some unique features such as direct funding of the identified groups, and capacity building of the supported communities. On the other hand, successful steps towards the achievement of SLM project objectives by the PMU are noted as follows:

- Training of farmers on group dynamics, financial management, monitoring and evaluation, record keeping, and ensuring that all the groups to be supported are formally registered as community-based organizations in their sub-counties or districts.

- The signing of Memoranda of Understanding (MoUs) with the communities to guarantee their funding and to empower them to become the engines of their own development.

- Leaders at district and sub-county levels helped to design District Environmental Action Plans (DEAPs). This made it easier for them to identify issues for inclusion in their own District Development Plans (DDPs).

- Partnering with other actors on Conservation Agriculture such as the Rural Enterprise Development Services that has helped to train farmer groups in conservation agriculture.

- Use of the farmer-to-farmer mutual learning approach that incorporated farmer trainers and farmer visits.

- Linking farmers to researchers by making visits to research stations such as the National Agricultural Research Laboratories, Kawanda (NARL) to enlighten farmer groups on the agricultural technologies being developed, using Makerere University to carry out research within the beneficiary districts of Kamuli and Nakasongola. In Nakasongola, NARL carried out research on the biological control of termites, while in Kamuli, Makerere University carried out research in agroforestry systems on the control of pests and diseases in fruit orchards (e.g., mango flies).

- Guiding the groups through proposal writing, drafting budgets and work plans. Communities were requested to include in the proposals what needed to be addressed by UNDP.

Despite the successes recorded under the project implementation, there have also been challenges and constraints leading to delays in the execution of some of the activities planned. Some of these fall under institutional and operational challenges, others were programme-related such as problems establishing pilot roadside markets for SLM produce in the six cattle corridor districts. The failure to establish these markets is attributed to the lengthy bureaucratic public procurement process and difficulties in acquiring land on the roadside. However, experience from other projects that have attempted this action show that roadside markets have not added as much value as long-established markets linking producers of SLM-friendly products to bigger markets and to microfinance providers.

Development of district environment action plans (DEAPs) to capture SLM priority issues and hence mainstream these into District Development Plans and budgetary systems also took longer than planned. The DEAP process is a bottom-up participatory process that starts at the parish level with

the preparation of parish environment action plans (PEAPs) through the sub-county with preparation of sub-county environment action plans (SEAPs). Finally a consolidated District Development Plan is developed by prioritizing the issues raised in SEAPs for that district. The process took long because local government elections at district and sub-county levels required newly elected officials to be brought on board with the process and its objectives. There were often disagreements following the elections that further delayed the process.

To ensure the sustainability of a project, it is important that these planning processes are completed prior to major project activities. Planning helps a project identify priorities for communities who will subsequently own the interventions, ensure that they fit into the wider district plans and meet eligibility requirements for district funding, which would further guarantee the sustainability of project interventions. In addition, community-based interventions funded by the project are required to address one of the identified issues in the sub-county of the proposing organization. As a result, the changes or impacts relating to the intervention can be passed on to sub-county leaders or those involved in fundraising drives to ensure that the initiative reaches the entire sub-county where environmental or SLM issues exists.

*Kaliro district - Community project planning process.*


*Grace Wambuzi of WACIDI holding tree seedlings, Kaliro District, SLM project, Uganda*

# VIII. Lessons Learned

## a. Shared Lessons From Ethiopia and Uganda

Although specific activities and implementation schemes varied by country, it was important for both countries to employ sustainable land management practices and technologies along with traditional conservation and drylands management methods to reduce or reverse the process of land degradation, improve land resources management and conserve water and soil fertility. In addition, the importance of a bottom-up approach involving the local community throughout the project management process from planning to implementation was necessary for a sustainable process on the ground. Peer learning from experience sharing study tours between communities along with farmer-to-farmer exchange visits between districts were key components that led to the increased use and transfer of technologies and practices between communities in both countries. This required the thorough and proper training of local staff. Establishing key decision-making structures such as the SLM platform and Interministerial National Steering Committee, a Technical Working Group of the five participating sectors and a Sector Working Group, helped to develop integrated planning approaches and resulted in the development of cross-sectoral SLM projects to be managed as a single portfolio in Uganda. The increased coordination and collaboration across different bureaus was made possible by the establishment of a Regional Steering Committee, District Steering Committees, Technical Working Groups consisting of relevant experts from different government bureaus to provide guidance in Ethiopia.

## b. Country Specific Lessons

### i. Ethiopia

The AIDMP has made great progress on activities relating to watershed (natural resources) management, rangeland management, livestock production, small scale irrigation, marketing, early warning

information, potable water supply, and environmental management. Many of these accomplishments have required acquiring skill and knowledge and need to be scaled up and replicated.
The lessons learned include the following:

- Inter and intra project sites along with visits to share experiences among community members, pastoralists and agro-pastoralists, have taught the community new ways of doing things.

- The promotion of watershed management activities specifically the physical soil and water conservation activities, were first initiated with the support of the AIDMP. This is not an ordinary achievement. The continuation of these activities will significantly help pastoralists become self-sustainable and able to cope with climate change.

- The gully rehabilitation activities based upon free stone and gabion reinforced stone checkdams have been very successful.

- The use of mud bricks for housing construction will significantly benefit the environment and residents alike. This alternative building method has already caught the attention of neighboring communities and its expanded use will also benefit regional settlement programmes.

- The use and promotion of alternative energy sources such as solar panels will help foster climate resilient economic growth. The use of these panels by health institutes in AIDMP project sites, has highlighted the importance of expanding the use of clean alternative energy from different sources.

- There have been good results related to the traditional rangeland management technique of enclosing a specified grazing area and shifting grazing. This has emphasized the need to advance indigenous dryland management and conservation techniques.

- The project sites were selected based on criteria set by regional government experts who were thereby able to identify those with the greatest needs. This has highlighted the importance of programme selection based on needs-based criteria.

The success of AIDMP activities is directly related to the local relevance of their methodologies. For instance, as the woreda steering committee became stronger and sector offices became fully vested in project outcomes, supportive policy changes soon followed.

The activities were drawn from the needs of the community as identified by the local Climate Change Adaptation Plan of Action. Communities were also part of project design and implementation, creating a sense of local ownership and interest in sustainable results. The Project paid special attention to the needs of women and the poor, with appropriate and sound community participation and organization, information sharing, dissemination and awareness-building that was molded to fit the specific needs of beneficiaries.

The activities were not too sophisticated and complex and did not require a high- level knowledge and skill base. In addition, project activities were designed to provide solutions that would impact a large number of beneficiaries. These large-scale projects include watershed management activities, rangeland improvement activities, small-scale irrigation and related support, the establishment of market centers, and support for the improved electrical infrastructure of health institutions.

The project information including the proposal document, presentations, progress reports, and pictures at different stages of project implementation were documented properly, for future use. The current lessons learned document also serves this purpose. As a result, all aspects of the project activities have been documented and can be easily disseminated and replicated.

# Stories from the Community

The drylands development successes at Derayitu Kebele of Awra impressed development team members travelling to Dewe and Chifra Districts where the AIDMP was under implementation. The outstanding physical soil and water conservation activities of all project sites stood out. The hillside terraces, halfmoons and trenches constructed at Kilintina Darasa Kebele of Dewe; Wo'ama and Chifra Kebeles of Chifra; Mille and Ewa woredas at different kebeles were impressive. The case of Wo'ama Kebele provides the focus of this discussion as the kebele chairman was the key informant who accompanied the team during the visit.

Wo'ama Kebele is situated 25 kilometres south of Chifra district, where many activities of the AIDMP were implemented. The SWC activities at Dierewoyu site of the Wo'ama Kebele were particularly exceptional as they were the first such activities at the site. The kebele chairperson, who was leader of the visiting team along with the district level focal person and the field officer, was proud to talk about and show the physical structures. "This is what we have done, and hoped to go ahead in the future. We are hoping these structures will bring positive capacities on the fight to relieve climate change-induced livelihood challenges". He was specifically referencing the perfectly constructed hillside terraces, stone-faced and tie-ridged soil bunds, trenches and checkdams.

He went on to further discuss his impressions. "Experience sharing and community mobilization activities have helped the project implementation to start from best practices and yield better performances. The way the community was attracted into the project and the lessons learned from working with disadvantaged communities are now paved. The communities, in the entire Wo'ama kebele, are well encouraged to take part in any development activity, if they are well consulted. And in this project we had full support because of the elements of the project and its implementation modality. There have been other projects before, but none of them have brought such an impressive success.

We know our big problem is the degradation of the land and water resources, and restoring and reclaiming these resources would bring life back to normal and comfort. This catchment area is agreed to be protected from livestock and human interferences. We are looking for fencing or marking the catchment, and if that happens the catchment will be further strengthened through biological conservation activities. Trees will be planted at the upper sides of the bunds and trenches, where water will potentially be stored. This will further strengthen the catchment development efforts".

These examples make clear that well-run development projects can be both anticipated and replicated.

# AIDMP Best Practices

The effective management of natural resources requires the use of traditional conservation methods along with modern scientific techniques. It is also useful to employ traditional practices from other disciplines both throughout and beyond the region itself. The programme undertook to assess, identify, synthesize and document traditional or indigenous natural conservation practices. A team of technical experts from the region was assembled for this purpose from Semera University, Afar Pastoral and Agro Pastoral Research Institute, and Afar EPLUA. The team analysed the findings in secondary documents, published and unpublished sources and produced a document of indigenous practices entitled, Traditional Natural Resource Conservation Practices of Afar Community. The major elements of the document focused upon the natural resources base of the region; related trends; current conservation and management practices; and tracking traditional practices that face extinction. Following this analysis, the team plotted an action plan with related recommendations. Target districts devised local strategies to adopt the plan.

The traditional practices and the plan of action documents were instrumental in the execution of a range of conservation activities including carefully managed herd movements, rotational grazing, rangeland enclosure, herd structure and splitting, mobility conditions and pastures evaluation.

Success for the development projects, as in the case of the AIDMP undertaking, relies upon the effective use of traditional systems, improvements to the climate change plans of action, and support for modern systems and technologies.

Experience sharing tours – learning from what works: has taught communities new ways of doing things. AIDMP supported experience sharing tours of the Afar pastoralists, Development Agents (DAs), and experts to a neighboring Worebabu district of the Amhara Region.

Participants in the AIDM Project areas were able to learn how the Worebabu community was able to manage their watersheds, or land and water resources. Following the study tours, the beneficiary communities were organized into groups and actively participated in the implementation of project activities, specifically those relating to soil and water conservation activities.

Project management: The project spanned five administrative levels (federal, regional state, district and kebele), in line with the institutional set-up of governments. To manage the project, two steering committees at the regional and district levels were formed, and project management units were established at district and state levels. There were five project offices with strong technical and administrative back up from regional coordinators and UNDP Country Office.

The District Steering Committee met frequently to discuss the implementation of the project, visited the target kebeles, and conducted project implementation review meetings with the UNDP Country Office. Successive field visits were carried out by programme coordinators and UNDP with occasional visits made by the regional and state Bureau of Finance and Economic Development (BoFED) and district steering committees. The regional state and district steering committees were frequently reactivated and supported by UNDP staff.

*Sound community participation:* The involvement and empowerment of local communities in the design and implementation of dryland management activities was believed to be the key contributing factor to project success.

The target project community at the district level took part in the problem identification and project implementation, boosting their commitment far beyond what was expected. Ultimately, the full inclusion of the native pastoral community yielded sustainable success that is likely to be replicated in the future.

*Soil and water conservation:* Land and ecosystem management practices can lessen the harsher consequences of dry periods. These practices might include slowing down run-off, building water storage/moisture retention structures, planting tree species that promote the growth of other plants, and diversified agro-forestry practices that help maintain vegetation cover. Such practices can also minimize the impact of drought by sustaining and safeguarding the benefits that ecosystems provide.

The AIDMP has supported the management of small watersheds in each of the five target districts. This was the first activity of its kind in the Afar community. The communities utilized both their own knowledge of traditional natural resources management practices along with lessons learned through visits to the Amhara Region. Representative community members, who took part in the experience sharing visits and other trainings were able to mobilize the entire community to fully participate in and commit to the construction of soil and water conservation activities and management initiatives.

Soil and water technicians were also trained on how to survey the land for laying structures, and how to lead the technical implementation of conservation activities. Physical soil conservation and water retention activities, gully rehabilitation activities and river training/river bank stabilization activities were successfully accomplished, with a 50 percent participation rate by the local community.

The conservation structures were well situated to increase the discharge capacity of springs and rivers, the development of forage grasses from formerly degraded lands, the reduction in floods and an increase in the moisture of grazing lands, along with other related benefits. With these advantages, the farmers are poised to enjoy an increase in the productivity of grazing lands through the improvement of soil moisture conservation and reduced erosion. This will help them properly manage their animals and lead to an improvement of livestock sales as well. The proper management of watershed activities through the adoption of different techniques is also known to mitigate climate change.

## Community Views on Programme Implementation.

Abdukhalif, a vice chairman of the Derayitu kebele at Awra district, and the task carrier on the implementation of the AIDMP activities within the kebele, felt strongly that project activities would improve the lives of community members. According to Abdukhalif, the "Derk Mequaquam" means the dryland management programme has started impacting the lives of the local community and has been accepted in contrast to other externally supported programmes. He has informed the team that the people were not hesitating to participate in the implementation of AIDMP activities.

As stated by Abdukhalif, the programme not only addressed the community's needs, but involved them. "We will show you impressing accomplishments if you give us time to see what we have done so far. But we also promise to move forward if there is a continued support in such accomplishments''.

"Look at the hill, where many physical soil and water conservation activities are constructed, and some areas are protected from erosion, downstream grasslands are protected from flood and depositional problems, which served the community as grazing lands''. Mohamed (another person in the area) attracted the attention of visitors, pointing at a catchment where SWC activities were constructed. The project field staff were also eager to have a visit to the area that Mohamed and Abdukhalif were pointing out. The enthusiasm of a community for whom this was a first activity was encouraging. "This is very good for a first-starting community and is encouraging," one of the visitors was heard as saying. As the first such activity, the success of this initiative bodes well for the future.

Solar panels as an alternative green energy source: The health centres, which were suffering a lot due to the absence of electricity, are now enjoying the multiple advantages of solar electrification. They are able to preserve vaccines so that they can vaccinate populations when necessary and also administer medication around the clock.

Additional solar panels were requested for more health stations and rural schools. For rural schools, the panels enable them to equip their study center with a television, video player, and computer that help to promote community dialogue and adult literacy. These panels can be further extended to villages throughout the region. In addition, the settlement of pastoralists by the Afar government would benefit from the implementation of alternative energy sources to protect forests and stem the impact of further climate change and drought.

## Solar Electrification Improves Service Performance

Solar Panels, for rural electrification, have been installed at Bilu Kebele in Ewa District, Health Post. This way, 10 panels of 130 watts each were installed and powered 1 deep refrigerator and 6 lamps of 60 watts each. This refrigeration helped to preserve vaccines and other sensitive drugs such as night-time medications for emergency cases. Staff were also using the refrigerator for drinking water and food, enabling staff members to stay at the area for extended periods so that they could provide appropriate care to community members who might have to risk their lives if they had to travel long distances for care. The round trip of 16 kilometres to the medication center in Ewa discouraged some patients from seeking care and cost many lives as a result.

Bilu Junior school teachers also benefited from access to refrigeration. Approximately 10 teachers were sharing the benefits of cool drinking water and preserved food and this made it possible for them to remain in the community and effectively advise and teach their students.

*Solar Panels for Health Centre electrification, ChifraWoreda, Afar Regional State, Ethiopia*

The Afar region is planning to have a regional settlement programme that could use mud block housing to prevent further stresses to the environment.

*Mud-brick houses – a transformation in the housing sector:* Traditional house construction largely relies on the use of wood products. This greatly contributes to the deforestation process, pointing to the need for sustainable building materials for low-income groups. AIDMP selected mud block/bricks for its low-cost house construction.

Bricks made of mud, which can be produced by anyone anywhere, are good construction materials with ecological, economic and social advantages that make them comparatively better than conventional

wooden houses. Their specific advantages include reduced deforestation, halved cost of construction material, durability (more than 60 years in some parts of Ethiopia), temperature moderation (reduces warming effects), and fireproofing. The disadvantages of mud brick housing include poor water resistance, brittleness, low tensile strength and poor resistance to abrasion. In sum, however, the advantages of mud bricks far outweigh the disadvantages.

## Solid Mud Brick House Construction as Heard from Implementers

The project has provided training on brick production and provided mud-brick producing molds to each of the five project areas. Each area was at the demonstration stage in 2012, but trainees were already requesting additional molds for the bricks. The visionary trainer Mohamed, residing in Awra, was part of the project implementation. It was Mohamed, a government employee office gardener, who first started using solid mud blocks to construct houses. In Awra district about 17 people (5 women and 12 men) were trained and Mohamed hopes 3 women and 11 men will help him train others on the technology. Adem, the district field officer, says some trainees are asking for the block mold in their communities.

"I went through the technology from a video somewhere, and constructed my own house and proved how it works", said Mohammed. "Some people around asked me to do the same for their own, and to date I have constructed for one. I will be working on this as far as people are convinced of, and hoped to go ahead for replacement on the gardening job".

Ato Takele, Programme Analyst at UNDP, was eager to see people constructing houses with mud blocks. He asked Mohamed how it compares to a similarly sized wooden house. The trainer replied that it would be extremely cost effective, citing that at current prices one HCB/hollow concrete block of the same size costs 14 birr, but the current SMB/solid mud block costs only 5 birr per block. Then he calculated the cost for a 4mx4m room, and came to the conclusion that a household will enjoy a reduction in cost of approximately 6000 birr per house, which is extremely significant for a low-income family.

*Prototype House built from Mud Bricks, ChifraWoreda, Afar Regional State, Ethiopia.*

*Fodder banks – drought contending mechanisms for pastoralists:* In most small-scale farming systems, livestock graze in pastures or woodlands while feeding on grass and herbaceous plants. During the wet season, these lands provide adequate forage to maintain productive animals. In the dry season, however, the quantity and quality of forage greatly decreases and is generally low in nutritional value. Livestock sustained on such poor diets often loses weight and productivity. To avoid these problems, farmers must provide their animals with quality feeds to augment dry season forages. A more practical solution is to establish fodder banks, plantings of high-quality fodder species, to maintain healthy productive animals, for use during forage deficit times of the year. The fodder banks are designed to bridge the forage scarcity of annual dry seasons, and supplement the available dry season forage.

The AIDMP supported the target districts to establish fodder banks. The main objectives were the multiplication of different forages for distribution to the community members for use during forage deficit times of the year, and for distribution to those who were not able to search for animal feed at longer distances, because of age or other health-related vulnerabilities. The fodder banks were established near perennial rivers, which help grasses reach maturity, and produce grass two to three times a year. The forage banks were sown with Alfalfa, Panicum and Rhodes grass, entirely watered with supplementary irrigation in rain deficit rainy seasons and full irrigation for greater production during the rest of the year.

The fodder banks were delineated and properly cultivated to improve their productivity. The sites were provided with water pumps, sufficient water hoses, and furrow irrigation was employed. Farmers managed the fodder banks and were trained in water lifting, application, land management and agronomic practices of the forage. These people have also gained experience in managing other plants like crops.

Some of the fodder banks have already served one season and were under reinstatement for another, but few others have been established.

Medina, one of the employees working on the fodder bank, at the Wo'ama *kebele*, was full of smiles and energetic. She was telling the team that she is praying for God to keep up their efforts. "These grasses are grown at our land and for use for us", said Medina. "Those people who were not able to feed their animals, at times when there is no grazing, are entitled and will feed them for free. We know some agro-pastoralists grew crops from irrigation, but now we are also learning that we can produce forage through irrigation. This is a very good strategy, and we will exercise even in other areas. What we need is not the technique, but the materials we could not own".

*Harvested Fodder, ChifraWoreda Fodder Bank, Afar Regional State, Ethiopia.*

*Rangeland improvement* – a mitigation mechanism: Climatic fluctuations are a defining characteristic of dryland areas, as rainfall varies substantially between and within years, affecting the lands and pastoral livelihoods. Predicted changes in rainfall patterns result in increasingly scarce, scattered and unpredictable pastures. As a result, access to pastures becomes more difficult, leading to the loss of livestock and of livelihoods.

The AIDLM Project was able to use traditional methods to close grazing areas to prevent roaming animals on rangelands so that grasses can feed animals on a cut and carry system or with a controlled grazing technique, depending on what is suitable for the pastoralists.

"Look" said Abdukhalif, a farmer in Awra district, "look how the closed area appears against the free grazing land. There is much difference, where the local laws developed by the participation of the local community are working in the protection of the closed areas. We sat together, discussed on what we shall do, on what parts we should participate, on what we do in the management of the closed areas. Then we took part in the fencing of the closed areas, developed bylaws on how to protect and elect guardians to guard against those violating herders. No one will violate the laws and will not grieve if punished for violating the laws since the articles in the law are informed of the whole community, and are agreed to by them. Therefore, we hope this will bring changes in the communities' lives", he concluded.

A herder who was keeping his stock was also eager to share his observations. Mohamed Seid is a father of eight and the head of two families. He was herding his goat stock near a closed rangeland. "What are you doing here?" was the question first raised by the visiting team. "I am keeping my stock having grazed on the permitted lands protecting the closed area'' was Seid's short answer. What do you observe here in the range area and around was asked of Seid.

He replied that "hopefully a drought relieving closed area and an open grazing area currently open for grazing". Who supported you in doing this closure? Gazing at the UNDP field staff, Seid said "here are our colleagues who have worked hard in advising the community to do so. They were here with us for longer, and have advised and initiated us to take part in many aspects of land development. Our women and the men respected the advice and took part in the delineation of areas for closure, actively participated in the construction of bunds and check dams on potentially eroded areas and gullies".

*Filed Visit - Soil and Water Conservation structures, discussion with beneficiary communities, ChifraWoreda, Afar Regional State, Ethiopia*

### ii. Uganda

The SLM Mainstreaming Project was implemented at both the national and local levels by an array of stakeholders. These include, the Ministry of Agriculture Animal Industry and Fisheries (MAAIF), local governments of the cattle corridor districts of Sembabule, Lyantonde, Nakaseke, Nakasongola, Kamuli and Kaliro, community-based organizations and farmers in the sub-counties and targeted villages. Other implementing partners include, the National Environment Management Authority (NEMA) through the Directorate of District Support Coordination and Public Environmental Education, that supported mainstreaming of environment and SLM issues into district development plans and budgets; the Ministry of Water and Environment (MWE), through the Department of Meteorology; the Ministry of Lands, Housing and Urban Development; and the Ministry of Energy and Mineral Development; the National Agricultural Research Organization (NARO), Makerere University, and National Agricultural Research Laboratories, Kawanda.

The lessons learned and best practices are presented following the project objectives that were to i). support mainstreaming of SLM issues into District Development Plans (DDPs) and budgets; ii). support adoption of sustainable livelihood and land management practices by local communities in the cattle corridor districts; and iii). to strengthen the UNCCD/NAP Focal Point Office in MAAIF and the interministerial committee on SLM to support implementation of the national SLM Investment Framework.

*Mainstreaming of SLM Issues into District Development Plans and Budgets*

One of the objectives of the SLM project was to support the development of Parish, Sub County and District Environment Action Plans. In this regard, a participatory activity bringing together land-users and local leaders was carried out under the facilitation of NEMA officials to develop Parish Environment Action Plans (PEAPs); Sub county Environment Action Plans (SEAPs) and the District Environment Action Plans (DEAPs). Lessons learned and best practices from the process of the development of the PEAPs, SEAPs and the DEAPs include the following:

- The local communities understand and appreciate that there are certain livelihood activities that contribute to environmental degradation and are willing to change their practices when provided with alternative practices that are environmentally sound, but also can ensure that their livelihoods are not jeopardised. For example, they realise that bush burning, overgrazing and poor soil management lead to land degradation that is expressed in poor crop harvests threatening household livelihoods.

- Local communities can identify signs of land degradation and propose suitable and feasible mitigation measures.

- The SEAP and DEAP processes involving the local communities led to the identification of the causes and key impacts of unsustainable farming/land use practices helping to readily develop solutions to unsustainable farming. The processes of developing SEAPs and DEAPs have been consultative and originating at the sub-county level. The stakeholders at these levels have supported their development with a view that they might be taken up in the District Development Plans (DDPs).

- Environmental committees at the parish, sub-county and district level working together with the local communities can adequately develop environmental action plans, although they may require support both financially and technically. This can be useful when formulating district environment policies. Most of the districts do not have environment policies because environmental committees have not been operationalized. This project has shown that when environmental committees are empowered they can stimulate environmental consciousness in the entire district.

- The participatory nature of the DEAP process provided an opportunity to create awareness about the seriousness of dryland issues. This has increased the leveraging of resources toward SLM projects.

- The inclusion of leaders at the sub-county and district levels in the formulation of Environmental Action Plans has made it easier for them to pick out some of the environmental issues that they can include in sub-county and district development plans.

- Empowered environment committees are better able to lobby for a fair budgetary allocation for sustainable land management activities at all local governance levels.

- District Environment Action Plans that are developed using the bottom-up approach are more acceptable and easy to market for fair budgetary allocation at the district level.

- There is a need to enhance the technical, infrastructural and financial capacity of the District Environment Officers to promote sustainable land management practices effectively in their districts of operation.

*Adoption of Sustainable Livelihood and Land Management Practices by Local Communities in the Cattle Corridor*

A Small Grants Scheme was established as a strategy to support the adoption of sustainable livelihood and land management practices by local communities in the six selected cattle corridor districts. Under this scheme, 24 selected communities in the six districts have implemented projects that address priority SLM issues. Indeed, various technologies in the energy sector (e.g., improved cooking stoves, bio-char), conservation agriculture (e.g., L-trenches, basins, and stone lines), livestock husbandry (e.g., zero grazing, night kraaling) have been adopted by the selected communities. Consequently they are generating lessons, best practices, and gaining experiences that can be shared with other communities in the drylands of Africa. The SLM Project has demonstrated a clear understanding that despite the ecological, environmental, social, and institutional structural challenges, the economic value of drylands can be enhanced, hence increasing household livelihood options that are less susceptible to climate change. Some of the lessons learned, best practices and experiences gained include the following:

- An integrated approach to crop-livestock productivity (e.g., establishment of night kraaling and more effective use of animal manure and crop residues), and soil and water management practices (e.g., agroforestry, mulches, minimum tillage, basin and L-trenches digging, and cover-cropping) can greatly improve household livelihood strategies and income and food security in these communities that are dependent on natural resources.

- Availability of published training and reference materials on the various SLM practices among the communities being supported is key to the scaling-up in the various villages beyond the already participating groups. For example, the members of the Twali Banafu Farmers Association (TBFA) and Walwawo Community Integrated Development Initiative (WACIDI) are quoted as saying: "We find it difficult to train others as there are no reference materials beyond the notes we made during the trainings we participated in. When we teach them using only the notes we have some farmers we train doubt what we share with them".

- The practicing of conservation agriculture (CA) and other related SLM practices has been shown to increase agricultural output per unit area as compared to the traditional practices. The benefits the UNDP supported farmers' groups are getting, particularly the high crop productivity achieved through practicing conservation agriculture (i.e., use of basins, mulching and minimum tillage), has created interest and is motivating non-members to seek membership to the groups within

their communities. Others in protected vicinity areas have been motivated to adopt and practice approaches being promoted under conservation agriculture on their own.

- Conservation agriculture has also resulted in an increase in the use of farm inputs (i.e., organic manure, inorganic fertilizers) among the supported communities. However, the use of organic fertilizers is still limited as it is not readily available and is still very expensive to rural households, who incidentally form the largest proportion of the poor in the country. Additionally CA has enabled farmers to reduce the amount of seeds used per unit area because they use improved seeds following the recommended correct spacing and number of seeds per hole. Consequently this has contributed to a reduction in their costs of production.

- The local communities have a positive attitude towards conservation agriculture which is an opportunity that can be harnessed in the quest for SLM. Indeed, farmers are innovative and when the technology is introduced to them, they can make modifications to suit their unique environments. This is seen in the modification of the water harvesting system introduced in Kamuli, where the farmers introduced an overflow vent which was not in the original design.

- The best pathway for the adoption and promotion of conservation agriculture practices by farmers is through farmer-to-farmer exchange visits, peer learning, and farmers' resource user groups that are selected through participatory approaches. Farmers generally tend to believe and trust each other's experiences more than messages brought by outsiders.

- Local communities are knowledgeable on adaptation strategies in case their land is degraded, however, they need to be retooled and given exposure to better technologies and innovations that will enhance the resilience and productivity of the land they utilise.

- Weather stations established at the sub-county level in some of the districts are useful for local communities when planning adaptation strategies under the current climate change challenges. However, there is a need to expand to other sub-counties considering that the weather currently is extremely dynamic, and heterogeneous even within a sub-county and one needs more stations to make more reliable predictions.

- Processes leading to the formulation of environmental action plans raise the environmental conscience of participants and consequently lead to an increased demand for better farm inputs that promote sustainable land management. This therefore implies that any organization that intends to introduce sustainable land management practices in an area should be aware that the community will require inputs once they adopt the practice. There should be a mechanism to ensure that these inputs are accessible and affordable lest the community feels disappointed and may abandon the practices they had earlier adopted.

*Demonstration -rain gauge equipment installed by the Meteorology Department for collecting rainfall data, Nawaikoke sub-county, Kaliro District, Uganda – SLM project.*

*Capacity Enhancement for the UNCCD/NAP Focal Office and the Interministerial Committee on SLM to Manage SLM Country Programmes*

The capacity of the UNCCD/NAP Focal Office and PMU was strengthened to implement the project component to coordinate SLM activities at the national and local levels. In the process, key lessons can be learned and experiences and best practices documented that include the following;

- It is important to have a timely and participatory consultation of all stakeholders regarding project implementation. The Uganda rangelands development and management policy and the Uganda Strategic Investment Framework for Sustainable Land Management (U-SIF SLM) are examples of why this is important.

- The formulation of public policies in Uganda like in many African countries is often a very lengthy process due to regulations governing how public policies should be developed and approved, and may not necessarily follow project timelines. To be representative, such policies require that the voices of the majority of stakeholders are included in a participatory and consultative manner. Hence, such a process may require a lot of time and resources to engage and consult stakeholders at the local (i.e., parishes, villages) sub-national (i.e., district administration) and national level (i.e., ministries, research institutions).

- A multisectoral approach (including agriculture, forestry, wildlife protected areas management, energy, rural infrastructure, etc.) is required for the success of SLM in the country, as it provides a joint operational framework to implement priority interventions. The existing interministerial cooperation framework has encouraged the relevant ministries to work together and achieve their respective goals while respecting each other's mandate and avoiding a duplication of activities.

- Effective coordination across sectors and levels of government and the engagement of a wide range of stakeholders avoids duplication and increases complementarities resulting in SLM as a single portfolio across sectors, hence increasing resource mobilization and the optimisation of funds.

- Effective coordination by the PMU is crucial to the successful implementation of the community groups' activities. For example, supported farmer groups and community groups attribute their success in the implementation of their project activities to the various trainings and knowledge exchange visits they have had, direct transfer of funds, and timely technical backstopping, and monitoring from the PMU at MAAIF. A Project Management Unit needs to have the human capacity to offer timely technical backstopping and monitoring to ensure value for money for all the activities being implemented.

## Best Practices Under the Mainstreaming SLM Project Implementation

Some of the practices that have proven to work well and produce good results under the mainstreaming SLM project implementation include the following:

- Direct funding to the communities with minimum bureaucracy that has ensured value for money for the community projects being funded;

- Multisectoral approach to issues of SLM that has brought on board various sectors and government agencies that are concerned with the environment;

- Bottom-up approach to identifying and prioritizing land degradation issues, and the implementation of community chosen interventions;

- Building capacities of the local communities to manage their affairs in the implementation of project activities;

- Conservation agriculture in the face of an increasing human population and reduced land availability for agricultural production;

- Establishment of weather stations at the sub-county level to provide weather data on a local scale to facilitate local communities when planning adaptation strategies under the current climate change challenges; and

- Water harvesting at the household level using locally and affordable tanks made of burnt earth bricks.

Below are further elaborations on these practices.

*Bottom-up Approach to Identifying and Prioritizing Land Degradation Issues, and the Implementation of Community Chosen Interventions*

This approach is discerned from the participatory process of preparing environmental action plans at the parish, sub-county, and district levels. Environment Action Planning (EAP) is the process of integrating environmental and natural resources considerations into the socioeconomic development of a country at all levels to achieve sustainable development. It arises from the people's concerns about their environment and natural resources and the need to take action to conserve the environment. Therefore it is important the local people who are the custodians and users of the land resources are involved in identifying the key causes and impacts of land degradation in their locality. The first step is to make a courtesy call to the local government leadership in the district including the Chief Administrative Officers, Local Council 5 Chairman's Offices and Sub County Chiefs and Local Council Chairpersons' offices to explain the purpose of the activity. This should be followed with meetings with members of District Technical Planning Committee (TPC) who will later participate fully in the development of Environment Action Plans. The next step is to select members of the District Environmental Action Plans (DEAP) task force who are later trained on Participatory Rural Appraisal (PRA) methods which will be used in the consultative meetings. The consultative meetings should first be held at parish levels for problem identification, prioritization/ranking, making of time trends and development of the Parish Environmental Action Plans (PEAPs). Where possible, field visits should be made to sites where there are efforts to implement aspects of the action plans. The PEAPs should form the basis for the formulation of Sub-County Environmental Action Plans (SEAPs) which are later approved in a stakeholders' meeting and some of their aspects integrated into sub-county development plans and also the District Development Plans (DDP).

*Conservation Agriculture in the Face of Increasing Human Population and Reduced Land Availability for Agricultural Production*

Conservation agriculture (CA) may be defined as a way of farming that conserves, improves and makes more efficient use of natural resources through integrated management of the available resources combined with external inputs. In Uganda's cattle corridor districts, farmers define CA as a farming practice involving the use of planting basins, soil cover crops, mulching, water harvesting, manure and fertilizers as well as the use of appropriate herbicides to control weed. It promotes minimal disturbance of the soil by tillage (zero tillage), balanced application of chemical inputs (only as required for improved soil quality and healthy crop and animal production), and careful management of residues and wastes. Some of the common best practices under CA being implemented by farmer groups include: i). the use of planting basins; ii). water harvesting; iii). mulching; and iv). minimum tillage through the use of herbicides.

## Planting Basins

*Preparation of planting basins*

In planting basins, seeds are not planted along the usual furrow but in small basins, which are small pits measuring 35cm long, 15 cm wide and 15 cm deep. These basins can be dug out using hand hoes in lieu of ploughs for the entire field. Planting basins enable the farmer to plant the crop after the first effective rains when the basins have captured rainwater and drained naturally. Seeds are placed in each basin at the appropriate seeding rate and covered with clod-free soil. The use of basins enhances the capture of rainwater from the first rains of the wet season in dryland areas that have erratic and unreliable rainfall. It also enables the precise application of both organic and inorganic fertilizer that is applied directly into the pit to reduce wastage without being more widely dispersed.

The basins are designed on the nature of the landscape where crop planting will take place. On flat lands or planes, basins can be established at 35 cm intervals along parallel lines/rows separated by 90cm from each other (see Figure 1). While for sloping land or land with pronounced elevations, basins may be constructed in a "z" arrangement along the contour (see Figure 2).

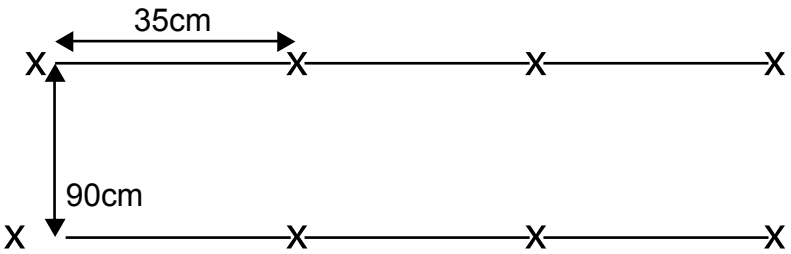



*Figure 1. A schematic illustration of the arrangement of rows and points for the digging of planting basins on a flat ground*

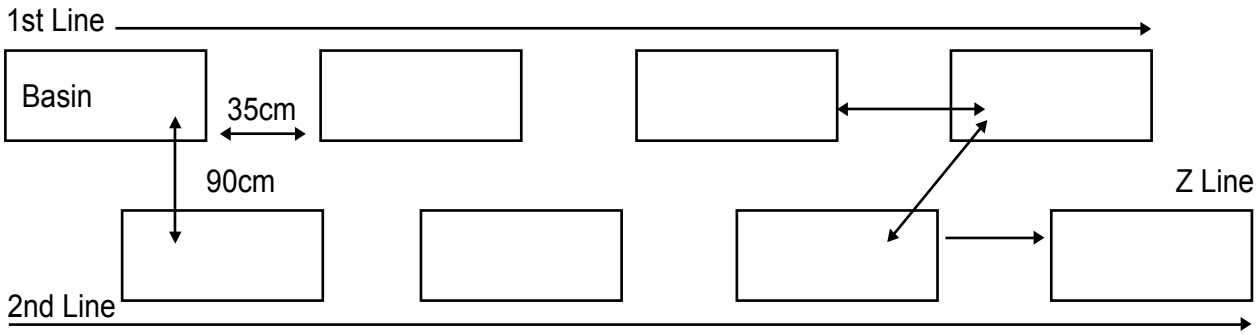



*Figure 2. A schematic representation of the recommended "Z" arrangement of planting basins along a contour*

Steps to follow in establishing and using planting basins include the following:

i. Mark out a straight line at the end of the field, up and down the slope to form a baseline for the demarcation of planting lines/rows.

ii. Use wooden pegs to mark out the start of planting rows at an interval of 90 cm. This distance can be measured out using a stick of appropriate length.

iii. Using a marked string with either bottle caps, knots or paint, use pegs to indicate the positions where the basins will be dug along the planting row (Figure 1).

iv. Starting at the first knot at one end of the string, for hilly places stand facing uphill and dig each basin about 35cm long, 15cm wide, and 15cm deep (Figure 3). Keep the soil dug from the basin on the down slope side of the basin, to use for covering planted seeds later on.

v. When the basins for that row have been made repeat steps iii. and iv. for the next row. The rows of basins can be in line with each other, or staggered. Sow seeds in the basin immediately after the first effective rains that fill the basin and when the basin is still moist. But this should be after the rainwater has collected in the basin and drained away.

vi. Sow seeds at an appropriate population and depth as per the crop being planted. For maize and beans, plant three and six seeds respectively per basin. For maize, place the seeds in an evenly spaced line, one at each end and one in the middle of the basin. While for beans, place two seeds at each end, two in the middle and two at the end of the basin.

vii. Cover the hole using the remaining heaped soil next to the basin leaving a level surface. Ensure that no stones or heavy clods cover the seeds otherwise they will not be able to push through to the soil surface.

*Figure 3. A schematic representation of the arrangement of dug out planting basins established on a flat plane*

## *Mulching*

Mulching is one of the CA tactics (see Figure 4). At farm level, dry plant materials such as grass, crop residues of maize, sorghum and millet are used as mulch[7]. Mulching reduces soil temperatures. It also enhances soil productivity through increased organic matter content, soil moisture storage, aggregate stability and on decomposition it releases nutrients thereby improving soil fertility. Often crop residues are left on the land as mulch to conserve moisture and add nutrients while at the same time curbing erosion.

[7] Mulch is any material applied to the surface of the soil to reduce loss of water by evaporation, keep down weed growth and regulate the surface temperatures of the soil.

Figure 4. A bean garden mulched between the planted rows using a dry grass

## Water harvesting using locally and affordable tanks constructed of burnt earth bricks

Water availability and accessibility is a serious challenge in most of the cattle corridor districts. This has serious implications for household livelihood strategies in these areas. Although at times the areas receive heavy precipitation, it is erratic, and farmers need technologies to harvest it. In these areas CA is promoting water harvesting technologies that include the use of affordable locally constructed tanks (above the ground and underground) to harvest water from iron or tile roofs. The construction of the tank involves digging a rectangular pit, which is used for the construction of an underground tank (see Figure 5). The size of the tanks usually depends on the need, interest and resources available. The materials required for this purpose include sand, cement, locally made burnt earth bricks, iron sheets, timber, plastic gutters and pipes, and tarpaulin[8]. The pit is constructed using the locally available bricks and plastered. The inside of the constructed tank is lined with tarpaulin to hold water and prevent it from seeping through the walls of the tank. On the tank, an overflow pipe may be added to lead water into a home garden for crop productivity. On the upper wall of the tank there is a window which is used to access and draw water from the tank.

*Figure 5. An illustration of a constructed underground water harvesting tank beside a house with an inlet or delivery plastic pipe from the plastic gutter on the house*

[8] Tarpaulin is a fabric made of canvas material coated with tar, wax, paint or some other waterproof substance. It is a heavy waterproof material that is used as a protective cover.

## Farmer-to-Farmer Exchange Visits

Farmers learn best from fellow farmers. Farmers generally learn more from other farmers and often make good extension workers. They tend to believe and trust each other's experiences more than messages brought by outsiders. Under this arrangement, lead farmers from the participating farmers' groups are selected to serve as model farmers, or as extension workers who can demonstrate good practice and facilitate learning. These types of farmers should have a proven record of results and be dynamic, hard-working, and committed individuals who are trusted by other farmers. Ideally there should be a mixture of young, old, men and women, with varying levels of resources, so that their experiences are relevant to a range of households in the community and other far away interested communities. Exchanges among host farmers benefit all participants. People who share the information develop the confidence and skills to teach their newfound skills and learn from their experiences, while visiting farmers can ask questions and share concerns.

*Lead farmer, demonstrating good practices and facilitating learning in Kaliro.*

# IX. Key Messages and Recommendations

## a. Ethiopia

The key messages recommendations that can be made for easing the programme or a similar one are detailed below.

*The need for improving early warning systems:* Enhanced use of early warning information in drought areas helps provide people with timely and important information that helps reduce their risk. It requires the integration of four main elements: risk knowledge, monitoring and predicting, information dissemination and response. Any failure of any aspect of the system will result in the failure of the whole system. Early warning systems can prepare governments and donors to respond to situations before they turn into emergencies and farmers to get prepared for upcoming incidents (positive or negative). The AIDM Project will speed up the use of EWS as a major activity, and work on improving the entire system by developing links between the different levels of a community that are involved.

*Gender analysis*: Gender analysis is becoming a key issue in development programmes. The AIDMP has set the activity plan in a gender-disaggregated manner. The monitoring of project activities has proven that the participation of males and females was found to be variable. Women actively participated in the soil and water conservation activities, outweighing male participation, and are also highly burdened by household activities. But their participation in trainings and some stereotypically gendered activities is reported to be much lower than planned. Though these figures are not discouraging, much work remains, highlighting the continued importance of gender analysis and the mainstreaming of gender issues.

*Environmental assessment:* Some AIDMP activities, such as hand dug well construction, small scale irrigation, conservation structures to increase discharge of capacity of springs and rivers, market center construction, can have negative environmental impacts if implemented without due care. It is important to address potential issues before implementing programme activities. This would include preparing programmatic environmental assessments, developing environmental mitigation and overseeing plans for effective monitoring during the implementation of activities that are expected to make an impact.

*Programme exit strategy:* It is vital to have an exit strategy to ensure that the progress of programme interventions continues after the AIDMP officially ends. Follow-up and monitoring will be crucial to helping communities gain confidence in handling new businesses and activities successfully so a plan for next steps are in place to ensure that programme gains are not lost.

*The need for maintenance of soil and water conservation (SWC) activities:* The SWC structures that have already been constructed under AIDMP are excellent, requiring only minor maintenance. However, because of the very nature of the structures, unexpected torrential rainfall and animal roaming effects, these structures are likely to be broken sometime in the year. In addition, some SWC structures are weak and likely to fail. These inconsistencies in their quality can be avoided by improving the capacity of the local people who implement and monitor these activities.

## b. Uganda

In Uganda's cattle corridor belt, the state of ecosystems, biological communities and species are continuously changing as a result of both natural processes and human activity. Most of the activities being undertaken under the SLM programme such as conservation agriculture and livestock husbandry may influence the environment positively or negatively. To be able to detect and understand these changes and the factors that influence them it will be essential to have effective ecological monitoring programmes such as participatory community-based approaches, where the monitoring activities are carried out by the resource or technology users themselves. Biological and ecological monitoring will

be crucial to the understanding of the success of SLM activities within the project areas. The best way to determine if land management plans are effectively working is to establish the direct surveillance of biological parameters such as the production of crops.

Sustainability of SLM practices in the community groups and six cattle corridor districts is highly possible given that the community groups have acquired the skills and knowledge and are motivated to continue carrying out SLM practices and pass on the knowledge to others. But in order to achieve SLM targets in the cattle corridor districts and elsewhere in the country, it is worth increasing the security of tenure in all recognized land. Fortunately in February 2013, the Cabinet of the Republic of Uganda approved the long-awaited National Land Policy of Uganda. This policy will provide a framework on how land will be managed and used in Uganda. The policy provides a basis and further strengthens the already existing land laws on issues such as inadequate land use planning, land fragmentation and the destruction of ecological systems. It promotes land-use rationalization and allows Ugandans to own land without any prescribed ceilings, through a well-regulated market and a Land Information Management System. The operation of land tenure and administration systems should protect the property rights of those undertaking investments in land improvements or SLM practices, while also facilitating the transfer of land to those who are able and willing to undertake such investments. This is fundamental to providing individual incentives for SLM (UNCCD & FAO, 2009).

There are many challenges to ensuring sustainable livelihoods for people in Uganda's cattle corridor. These include overgrazing, land clearing, resource overexploitation, and wild fires. Therefore, solutions to these should be developed and applied by locality. Many possibilities exist to support relevant actions, but efforts to understand the nature of impacts and implement corrective actions depends on the availability of resources. Therefore, greater recognition and support is needed for SLM practices and technologies in view of their contributions to poverty alleviation, food security, women's empowerment, climate change adaptation and mitigation, and rural development.

The SLM practices being implemented by the various communities, are contributing to the harmonization of the complementary goals of providing environmental, economic, and social opportunities for the benefit of present and future generations, while maintaining and enhancing the quality of land resources.

The project has created awareness about community actions that are detrimental to environmental health and sustainability, thereby contributing to the national actions to achieve some of the targets for some of the UN Millennium Development Goals (MDGs), particularly MDG One and MDG Seven. By supporting communities to adopt sustainable livelihoods and land management practices, the project is contributing to building the capacity of communities to maintain land productivity, increase production in both the livestock, and crop resources, increase income from sales of agro-based products and thereby improve their livelihoods.

Since most of the activities are dependent upon the rainy season, it is important that there is a timely release of funds when farmers are being supported financially so that they may take advantage of early rains, increasing the chance of crop survival and productivity. A delay in the release of funds may result in late planting or entirely missing the planting season, hence frustrating any efforts to implement SLM activities.

To realize the full benefits of hay making among some of the community groups, it may be necessary to complement it with the provision of water in homes and also feed supplements. With the continued lack of water sources near or at home, women will continue to take animals away in search of water, thereby compromising their security and reducing the time available to look after their children and engage in other life lifting activities. On the other hand, feed supplements (e.g., milk booster) are required to improve the productivity of animals at the time when the feeds are low in digestibility and essential nutrients for milk production. High milk production at such a time of general scarcity will

boost the incomes of groups to feed their animals on hay and act as motivation for others to adopt the practice.

It is important that SLM is mainstreamed into the budget and planning process at each level of government in a way that focuses resources and efforts across sectors on agreed SLM objectives. This will require reforms to the national budget system (for instance to allow SLM expenditures to be more accurately identified and tracked) and needs to be supported by broader public finance reforms that improve the effectiveness of the planning and management of public resources and their allocation in line with agreed priorities (UNCCD & FAO, 2009).

PEAPs, SEAPs and DEAPS, NEMA can provide technical assistance and backstopping as part of quality assurance and compliance with national standards during the training of environmental committees, but it may not be feasible for them to do it in all districts down to the parish level. District environment officers, therefore need to be technically competent and should be mandated by NEMA to carry out the training of environmental committees in the districts of their jurisdiction. To achieve this they need to be adequately facilitated with the basic requirements to enable the successful completion of the environmental action plans development processes. Furthermore, NEMA also needs to develop a tool-kit that is adaptable in the formulation of environmental actions plans and the drafting of bye-laws or ordinances. This will enable more districts to prepare environmental action plans and bye-laws than today when NEMA has to practically visit all the districts to train the environment committees.

As farmers practice conservation agriculture to improve their farm productivity there is a need to work on the marketing of, and value addition to, their produce to enhance the returns from their investments. Increased incomes from their investments will be crucial to their continued practicing of SLM and attracting other community members to adopt SLM practices.

Uganda's cattle corridor districts have plant species, which are already suited to the dryland conditions and with a great potential for food production and pharmaceutical products development. There is therefore a need to facilitate their inclusion in the agricultural systems to contribute to household food security, biodiversity conservation, climate change and variability adaptation in the cattle corridor areas. Moreover, Uganda's national programme of adaptation to climate change recognizes the need to promote the production of traditional foods, including wild foods as a means of ensuring resilience in times of food scarcity (NAPA, 2007).

There is a strong body of evidence from the SLM project implementation about how farming practices and land management in different contexts can be improved so as to halt and reverse land degradation. The challenge, however, is how to scale-up from successful but fragmented and localised initiatives to programmes that are fully integrated within the district, national and sectoral development plans and budgets and hence are both institutionally and financially sustainable. Addressing this challenge will require effective coordination across sectors and levels of government, the engagement of a wide range of stakeholders, and effective political leadership.

*Field Visit - Soil and Water Conservation Structures, Mille Woreda, Afar Regional State Ethiopia;*

*Field Visit  Kaliro District, Conservation Agriculture, Uganda – SLM Project*

# X. CONCLUSION

This report has detailed the opportunities and challenges of unlocking the development potential of the drylands. These lands cover more than 41 percent of the earth's land surface and are home to two billion people. Pastoralism is the most widespread land-use system in the drylands, which are also home to some 50 percent of the world's livestock.

The case studies of Ethiopia and Uganda—two countries with a high percentage of drylands—provide clear examples of development tactics that are appropriate for any country context. Key among these lessons learned is the emphasis in the drylands of an inclusive approach to development that involves all programme beneficiaries, particularly women, in designing and executing sustainable programmes to which they remain committed far into the future; utilizing traditional methods of conservation agriculture in concert with modern methods, but with a shared commitment to green policies that can save costs, ensure productive livelihoods and protect the environment; documenting best practices for the purposes of sharing them with other communities, particularly through farmer-to-farmer exchanges; disaster preparedness systems that are responsive to variable and changing climatic conditions; and mainstreaming local strategies into larger national initiatives that also engender cross-sectoral collaboration among various governmental bureaus for improved service delivery.

Specific lessons from the two case studies include a call for greater use of watershed management activities and gully rehabilitation; use of alternative building materials such as mud bricks; use of alternative energy sources such as solar panels; and capacity enhancement for the UNCCD/NAP focal point and interministerial committee on SLM to manage SLM country programmes.

The challenges posed by drylands development are often ubiquitous and range from bureaucratic delays caused by local political conditions or funder circumstances, to managing climatic challenges when access to natural resources is already stretched thin, to promoting greater access to markets and influential peer networks. The key to maximizing the development potential of the drylands—and ultimately all lands—is designing plans on a needs-based assessment of local conditions that anticipate challenges and maximize lessons learned from other country contexts.

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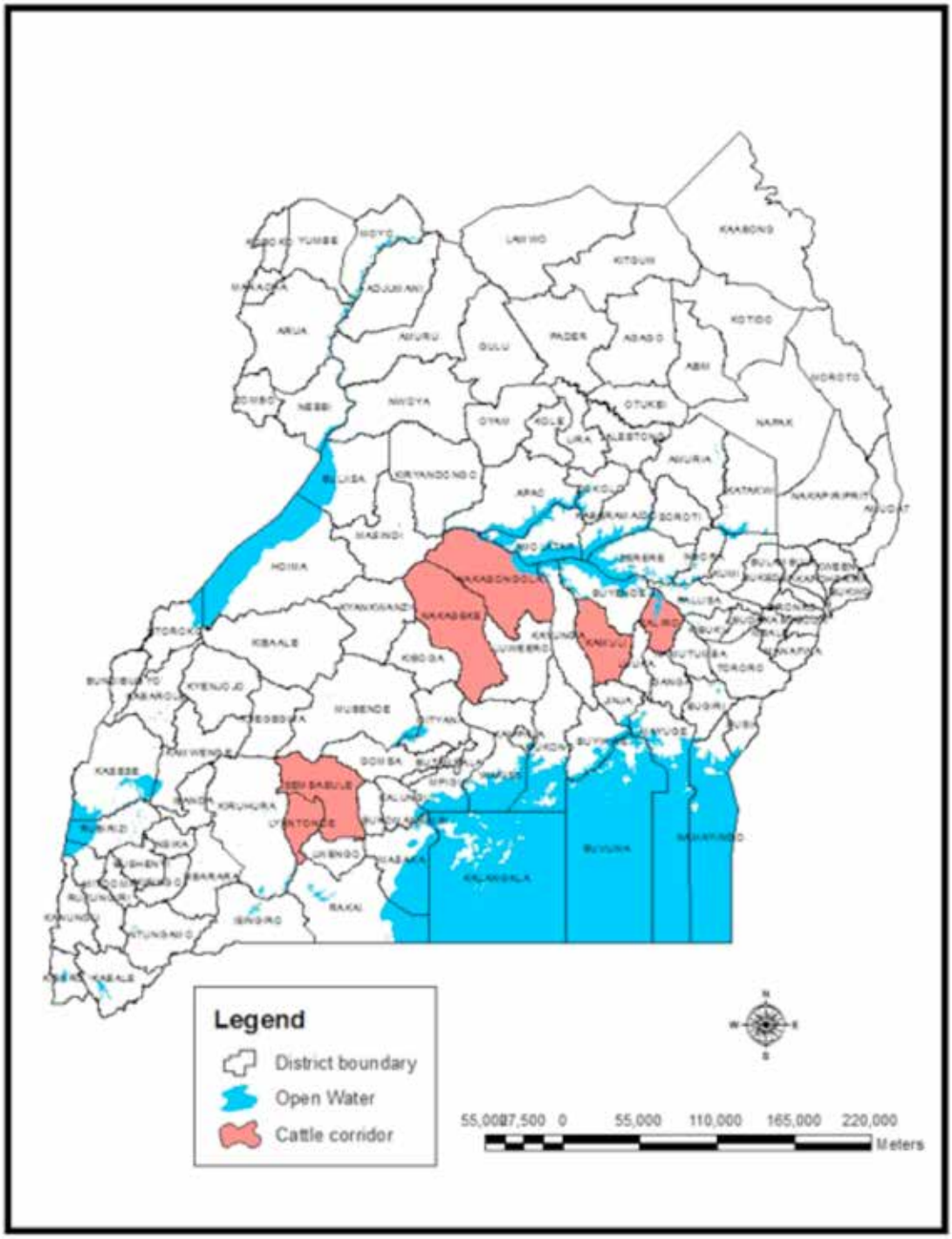
# Annex II: Country Maps

## a. Ethiopia: The Afar Region


Source: Semera University Greenification Project Proposal, 2012 People participated in the discussions and were interviewed.

## b. Uganda: The Six Cattle Corridor Districts




*Map of Uganda showing the six cattle corridor districts (marked in red) where the SLM mainstreaming project is being implemented.*

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United Nations Development Programme
Bureau for Policy and Programme Support
One United Nations Plaza
UNDP DDC
http://www.undp.org/drylandscentre
Email: ddc@undp.org