

BENEFITING FROM THE ENVIRONMENT IN A CHANGING CLIMATE

Climate Change and Natural Resources
– Adaptation actions to sustain ecosystem services



USAID | **SOUTHERN AFRICA**

FROM THE AMERICAN PEOPLE



Institute of
Natural Resources



GROW

BENEFITING FROM THE ENVIRONMENT IN A CHANGING CLIMATE

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The aim of the booklet is to provide communities living in the Lesotho Highlands an insight into the benefits adaptations such as sustainable land management practises can have on the rangelands and their livelihoods in a changing climate.

The Lesotho Highlands Climate Change Adaptation Project

Climate change could have severe consequences for both the people and natural environment in the Lesotho Highlands. Lesotho has called for assistance to ease livelihoods of communities who are subjected to greater challenges due to climate change (LMS, 2007¹). The inability of communities in the mountain zones of Lesotho to adapt in the face of the impacts of climate change not only threatens their own livelihoods, but also the production of water from the catchment, which sustains the Lesotho Highlands Water Project, and which in turn affects the economy of Lesotho as well as South Africa.

The overall goal of the Climate Change Adaptation Project in the Lesotho Highlands is to build capacities of local communities, NGO networks and government departments in order to understand and adapt to the likely impacts of climate change in the mountain catchment areas of Lesotho. The initiative aims to achieve this by tackling the interrelated issues of poverty, environmental degradation and biodiversity loss.

The Climate Change Adaptation Project is funded by USAID, and is being implement in partnership by the Institute of natural Resources, Serumula Development Association and GROW Lesotho.



¹ Lesotho Meteorological Services (2007). Lesotho's National Adaptation Programme of Action (NAPA) on Climate Change. Ministry of Natural Resources, Maseru.

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The Lesotho highlands climate change adaptation project, which is funded by USAID, aims to identify climate change adaptation strategies and building capacity for adaptation in the Lesotho highlands to improve the resilience of livelihoods and to sustain ecosystem services.

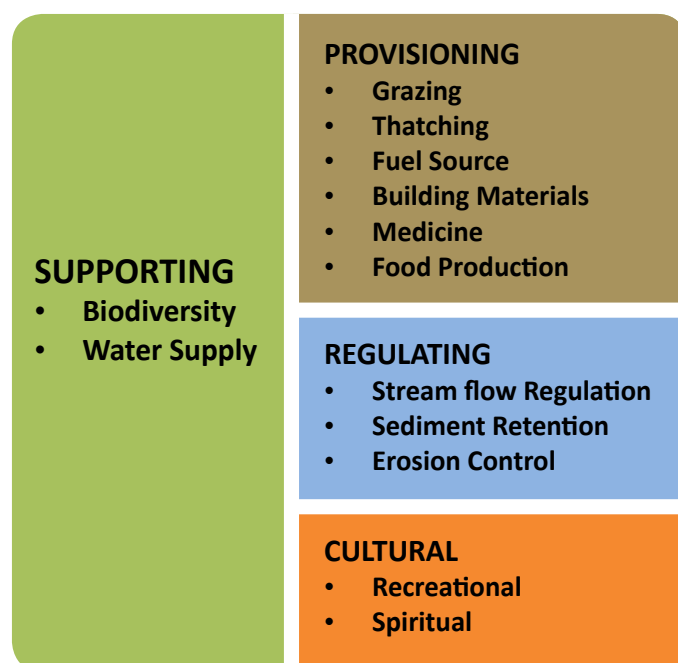
Climate change scenarios for Lesotho predict warmer climatic conditions and changes in seasonal precipitation. This will have serious implications for agriculture and the natural resources, which communities living in the Lesotho highlands rely on.

Biodiversity and healthy well functioning ecosystems provide natural solutions that build resilience and help communities adapt to the adverse impacts of climate change. Community livelihoods therefore depend on protecting the rangelands, wetlands, rivers, and all the natural areas, and ensuring that they are used wisely.

ECOSYSTEM SERVICES

An ecosystem is a community of animals and plants interacting with one another and with their physical environment. Ecosystems include physical and chemical components, such as soils, water, and nutrients that support the organisms living within them. These organisms may range from large animals and plants to microscopic bacteria. Ecosystems include the interactions among all organisms in a given habitat. Humans are part of ecosystems. The health and wellbeing of human populations depends upon the services provided by ecosystems and their components, i.e. organisms, soil, water, and nutrients. Therefore, ecosystem services can best be described as the benefits humans obtain from ecosystems (Millennium Ecosystem Assessment, 2005²).

According to the Millennium Ecosystem Assessment (2005), ecosystem services are categorized according to their functional groupings, which include provisioning, regulating, cultural and supporting services.



Climate change is likely to have an impact on ecosystem services, which will affect community livelihoods. Adaptions to improve the resilience of livelihoods and to sustain ecosystem services are required. The loss of ecosystem services through land transformation can be reduced through the implementation of Sustainable Land Management practices.

² Millennium Ecosystem Assessment, 2005. Ecosystems and human well-being, a framework for assessment. Island Press, Washington.
Source of Photographs: Institute of Natural Resources NPC, Serumula Development Association, and Prof Kevin Kirkman from the University of KwaZulu-Natal.

KEY ECOSYSTEM SERVICES

PROVISIONING SERVICES

Grazing for livestock



Thatching / roofing material



Fuel wood / materials



Building materials



Medicinal plants



Food production



**SUPPORTING
AND
REGULATING
SERVICES**

**Plants and
animals**



**Natural erosion
control**



**Capturing soil
lost from the
rangeland**



Supply of water



**Regulating the
flow of water**



CULTURAL SERVICES

Sports and recreation



Place of worship and beauty



SUSTAINABLE LAND MANAGEMENT

Sustainable Land Management is the adoption of land use systems that, through appropriate management practices, enables land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources (TerrAfrica, 2009³).

The high dependence of communities living in the Lesotho highlands on rain fed agriculture, the prevalence of poverty and food insecurity, and limited development of institutional and infrastructural capacities make coping with natural climate variability a perennial challenge.

- This challenge is being magnified by global climate change.
- These problems can exacerbate and be exacerbated by land degradation.
- Land degradation is not an inevitable result of climate variability and change, however, much depends upon how land resource users respond to climate changes.

Sustainable Land Management strategies and practices enable farmers and communities to adapt, as well as become more resilient, to climate change by increasing food production, conserving soil and water, enhancing food security and restoring productive natural resources.

³ TerrAfrica, 2009. Using sustainable land management practices to adapt to and mitigate climate change in sub-Saharan Africa, Resource guide version 1.0.

APPROPRIATE SUSTAINABLE LAND MANAGEMENT PRACTISES INCLUDE:

1 Rest grazing areas to allow grass to recover (ideally areas should be rested for the entire summer period).

Resting results in restored vigour of palatable grasses, resulting in a more vigorous productive grass sward able to better compete against shrub encroachment and provide greater soil protection.

Continuous livestock grazing



Camp rested from livestock grazing for a summer season



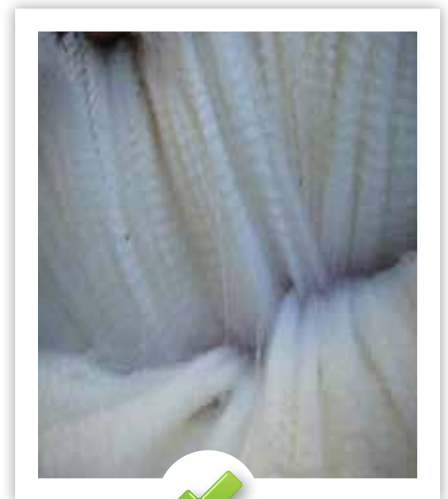
2 Improve quality of livestock and increase off-take.



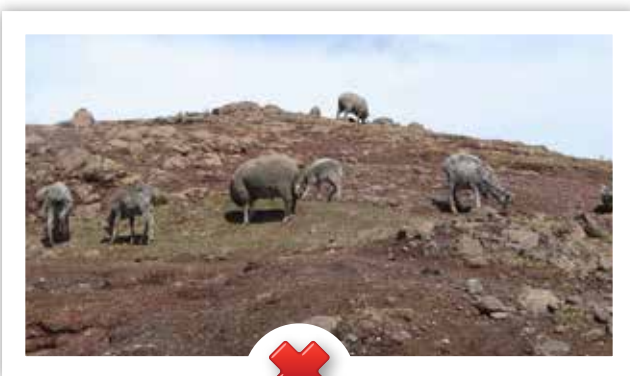
IMPROVED BREEDING STOCK



LIVESTOCK VACCINATION



GOOD QUALITY WOOL



OVERGRAZED & POOR QUALITY LIVESTOCK



POOR QUALITY LIVESTOCK

3 Rangeland rehabilitation – Stone packing eroded/denuded areas
(N.B. - exclusion of livestock from the site is required for an entire season).



4 Rangeland rehabilitation – Clearing of Chrysocoma shrubs
(N.B. - exclusion of livestock from the site is required for an entire season).



5 Rangeland rehabilitation – Reseeding denuded areas
(N.B. - exclusion of livestock from the site until denuded area has a suitable basal cover).



6 Appropriate Wetland Management – Reduce threats to wetlands including: overexploitation, overgrazing and trampling, soil erosion, cultivation and siltation.



The ultimate fate of gullied wetlands. Palatable plant species are almost entirely absent, the ability to store and filter water is substantially diminished, and sediments travel downstream to fill reservoirs.



CRAFT PRODUCTION FROM WETLAND GRASSES AND PRODUCTS

CONTROLLED GRAZING IN WETLANDS

CONTROLLED HARVESTING OF WETLAND PLANTS



“Lesotho shall adopt policies designed to protect and enhance the natural and cultural environment of Lesotho for the benefit of both present and future generations and shall endeavour to assure to all its citizens a sound and safe environment adequate for their health and wellbeing.”

-The Constitution of Lesotho







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