



**FAO/GLOBAL ENVIRONMENT FACILITY
PROJECT DOCUMENT**



Project title: Strengthening capacity for climate change adaptation through support to Integrated Watershed Management	
Project Symbol: GCP/LES/049/GFF	
Recipient Country: Lesotho	Resource Partner: Global Environment Facility (GEF)
FAO Project ID: 618527	GEF Project ID: 5124
Government/other counterparts: The Ministry of Forestry and Land Reclamation (MFLR), Ministry of Agriculture and Food Security (MAFS), Ministry of Energy, Meteorology and Water Affairs (MEMWA), Ministry of Local Government, Department of Environment (DOE) and National University of Lesotho (NUL))	
Expected OED (Starting Date): March 2015	Expected NTE (End date): February 2019
Contribution to FAO's Strategic Framework:	<ul style="list-style-type: none"> • Strategic objective/Organizational Result: SO2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. Organizational Outcomes 1 (output 1.1 and 1.2) • Lesotho Country Programme Framework (CPF): Priority Area 4. Natural resource conservation and utilization including adaptation to climate change
GEF Focal Area/LDCF/SCCF: Least Developed Country Fund	
GEF/LDCF/SCCF Strategic Objectives:	
<ul style="list-style-type: none"> • CCA1: Reducing vulnerability – Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level • CCA2: Increasing Adaptive Capacity: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level • CCA3: Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology 	
Environment impact assessment Category: A B C <input checked="" type="checkbox"/>	
Financing Plan:	
LDCF allocation	USD 3,592,694
Co-financing :	
GEF Agency (FAO)	USD 937,000
Government Programme	USD 7,500,000
Sub-total Co-Financing:	USD 8,437,000
Total Budget	USD 12,029,694

EXECUTIVE SUMMARY

In many parts of southern Africa, agricultural production is stagnant or even in decline, particularly in subsistence and smallholder agriculture. The reasons include lack of suitable inputs for production, environmental constraints and degradation, inadequate agricultural infrastructure, external shocks including volatile markets, and social stresses such as the impacts of HIV/AIDS and poverty. As an additional stressor, climate variability and climate change are impacting on agricultural livelihoods since resource-poor farmers are unable to cope with or adapt to climate risks. The Kingdom of Lesotho is a typical example of a country considered highly vulnerable to climate challenges. The country is over-reliant on rainfed agriculture for food production and has a large poor rural population engaged in subsistence farming. Vulnerability in Lesotho is characterized by fragile and substantially degraded soils, high levels of food insecurity and poverty, and lack of infrastructure which curtails the ability of the population to deal with increasing climate variability and climate change.

In response to the request from the Government of Lesotho, FAO has assisted Lesotho to prepare the proposal aimed at strengthening capacity for climate change adaptation through support to Integrated Watershed Management. The specific objectives are: (i) to implement sustainable land and water management practices (SLM/W) and resource conservation measures in selected watersheds to reduce vulnerability and enhance adaptive capacity at community level and (ii) to strengthen diversified livelihood strategies focusing on crop, livestock and agro-forestry systems at community level in selected watersheds in three most vulnerable livelihood zones. The project components include: (1) Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and climate-resilient livelihood strategies; (2) Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale; (3) Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds; (4) Strengthening diversified livelihood strategies and implementation of improved income generating activities at the community level and (5) Dissemination of best practices, project monitoring and evaluation.

The LDCF project focuses three livelihood zones covering three districts: Lowlands (Mafeteng), Senqu River Valley (Quthing) and Mountains (Thaba Tseka). The project will employ integrated watershed management approach at the local level to reduce the vulnerability and promote adaptive capacity to effectively respond to climate change impacts. 24 selected watersheds/communities and 1200 farm households will directly benefit from the project investments and technical assistance. The national and district level staff belong to the Ministry of Forestry and Land Reclamation (MFLR), Ministry of Agriculture and Food Security (MAFS), Ministry of Natural Resources (MNR), Ministry of Local Government and Department of Environment (DOE) and National University of Lesotho (NUL). Non-governmental Organizations (NGO)/Community Based Organizations (CBO) are the second level of beneficiaries through capacity development programmes.

The project contributes to national priorities under National Adaptation Programme of Action (NAPA), the Agriculture Sector Strategy (2003), the National Action Plan for Food Security (2006), the National Strategic Development Plan (2012/2017), SLM/W investment plan (2014/ 2024), the Lesotho Agriculture and Food Security Investment Plan (2014/2018) and Conservation Agriculture Strategic Framework (2012/2017). The project is aligned with GEF LDCF objectives: CCA1 - reducing vulnerability to adverse impacts of climate change, CCA2 - increasing adaptive capacity to respond to the impacts of climate change; CCA3 - adaptation technology transfer. The project is consistent with FAO's Strategic Objective (SO2): Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner and Country Programming Framework (CPF) Outcome: 4.3: Institutional and technical capacities for adaptation to climate change in agriculture strengthened and adaptive capacity of vulnerable communities enhanced.

The project will be implemented for a period of 48 months (4 years) with a total budget of USD 12,029,694 of which USD 3,592,694 is GEF LDCF resources.

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ACRONYMS

AMESD	Africa Monitoring of the Environment for Sustainable Development
APR	Annual Project Report
ASAP	Adaptation of Small-scale Agriculture Programme
AWP	Annual Work Plan
CA	Conservation Agriculture
CAADP	Comprehensive Africa Development Programme
CBNRM	community-based natural resource management
CBO	community-based organizations
CPF	country priority framework
CC	Community Council
DAOs	District Agriculture Officers
DDCC	District Development Coordination Committee
DFOs	District Forestry Officers
DGA	District Grazing Associations
DMA	Disaster Management Authority
DPU/O	District Planning Unit/Office
GA	Grazing Association
GDP	gross domestic product
GEF	Global Environment Facility
ICM	Integrated Catchment Management
IR	Inception Report
IRE	Intermediate Result
IW	Inception Workshop
IWM	Integrated Watershed Management
KPI	Key Performance Indicators
LAFSIP	Lesotho Agriculture and Food Security Investment Plan
LDCF	Least Developed Countries Fund
LENAFU	Lesotho National Farmers Union
LHDA	Lesotho Highlands Development Authority
LMS	Lesotho Meteorological Services
LRAP	Livelihoods Recovery through Agriculture Programme
LVAC	Lesotho Vulnerability Assessment Committee
MAFS	Ministry of Agriculture and Food Security
MDP	Ministry of Development Planning
MEMWA	Ministry of Energy, Meteorology and Water Affairs
MFLR	Ministry of Forestry and Land Reclamation
MLGC	Ministry of Local Government & Chieftainship
MOU	memorandum of understanding
MTEC	Ministry of Tourism, Environment and Culture
MTICM	Ministry of Trade, Industries, Cooperatives and Marketing
NAPFS	National Action Plan for Food Security
NAPA	National Adaptation Programmes of Action
NAP	National Action Programme
NDSC	National Desertification Steering Committee
NEC	National Environment Council
NEPAD	New Partnership for Africa
NGA	National Grazing Associations
NGO	non-governmental organisation
NRM	natural resource management
NSDP	National Strategic Development Plan
NUL	National University of Lesotho
PSFL	Private Sector Foundation of Lesotho
PIR	Project Implementation Review

PPG	Project Preparation Grant
RCU	Regional Coordinating Unit
RMA	Range Management Area
RMD	Range Management Division
SANRMP	Sustainable Agriculture and Natural Resource Management Programme
SANReMP	Sustainable Natural Resources Management Project
SC	Steering Committee
SIP	Strategic Investment Programme
SLM/W	sustainable land and water management
SWC	soil and water conservation
TCP	Technical Cooperation Programme
TRF	Traditional Rainfed Farming
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNDRMT	United Nations Disaster Management Team
UNFCCC	United Nations Framework Convention on Climate Change
USAID	U.S. Agency for International Development
WMO	World Meteorological Organization

SECTION 1 - RELEVANCE

1.1 GENERAL CONTEXT

A. General development context related to the project

Geographical and topographical features: Lesotho is a landlocked mountainous country situated in the southern part of Africa between the southern latitude 28⁰ and 31⁰, and eastern longitudes 27⁰ and 30⁰. The country comprises 30 588 km² of land surface that is entirely surrounded by the Republic of South Africa. Lesotho's main features are the Maloti Mountains which are part of the greater Drakensberg range. Lesotho is the only country in the world with the entire land surface situated more than 1000 m above sea level. The lowest point in the country, where Senqu River flows across the border is 1 388 m above sea level, while the highest part, Thabana Ntlenyana is 3 482 m above sea level.

Agro-ecological Zones: The country is divided into four agro-ecological zones on the basis of its geographical and topographical features (Fig. 1). The zones are often referred as livelihood zones: Lowlands, the Foothills, the Mountains and the Senqu River Valley. The Lowlands region covers an area of 5 200 km² or 17 % of the total surface. The southern Lowlands are characterised by poor soils and low rainfall, while the northern and central Lowlands have large deposits of volcanic soils. The Foothills comprise 4,588 km² of a strip of land that lies between 1 800 and 2 000 m above sea level, and forms 15 % of the total land area. The Foothills consists of very fertile land that is associated with high agricultural productivity.

The largest ecological region, the Mountains, covers an area of 18 047 km² and comprises high altitude plateau, bare rock outcrops, deep river valleys and wetlands. It is the source of many rivers which empty themselves towards the Indian and Atlantic Oceans. The region forms the main livestock grazing resources in Lesotho. The fourth region, the Senqu River Valley, forms a narrow strip of land along the Senqu River, and penetrates deep into the Drakensberg ranges. Senqu River Valley covers only 9 % (2 753 km²) of Lesotho's total area. The soils of the Senqu River valley vary from rich to very poor, thereby rendering the area the most unproductive region in the country.

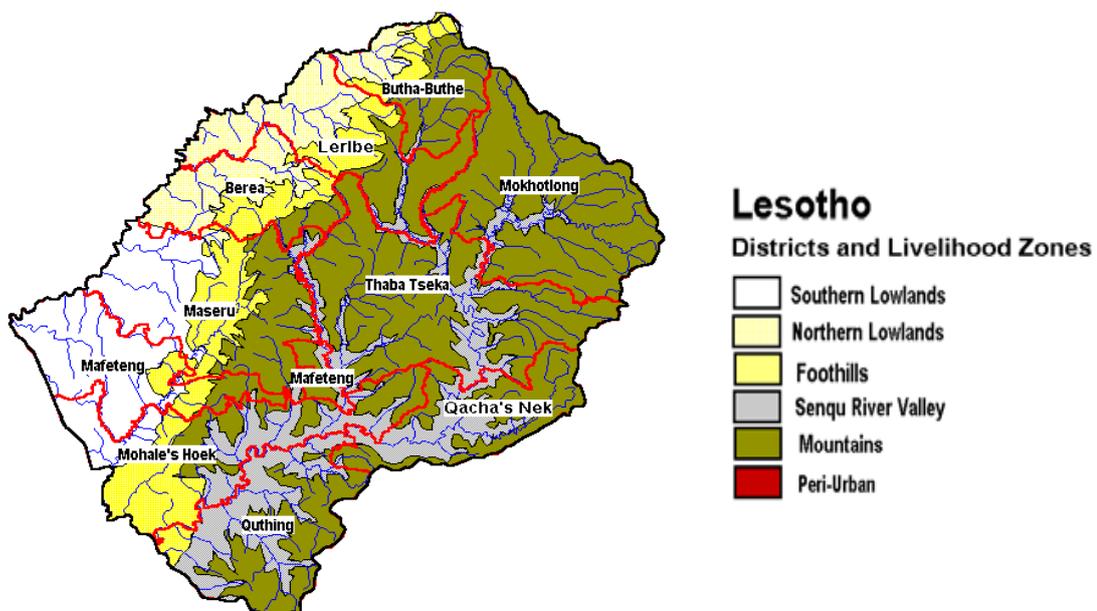


Figure 1: Lesotho districts and Livelihood zones (source: LVAC 2003).

Natural Resources: While Lesotho is endowed with relatively abundant water resources, it is known to be a resource poor country with minerals existing in non-economic deposits. The arable land not

only constitutes 9 % of total land area but that land is gradually shrinking due to severe soil erosion, land degradation and encroachment by human settlements. There is growing food deficit due to both agricultural production and productivity being undermined by increasing human and animal pressures, poor land management practices, and adverse weather conditions. The country is characterised by depleting vegetative cover due to overgrazing and deforestation which lead to serious impacts of environmental degradation. All of these factors are collectively responsible for Lesotho's downward spiral in providing food security for the citizens. There are no strategic reserves for providing food during the most difficult period of depleted household food reserves as being experienced now.

The climate is marked by four identifiable seasons. Normal annual rainfall of 700 mm is received during the months of October to April, with averages of 1 200 mm recorded in the mountain region. The low averages of 500 mm are recorded in the Senqu River Valley. Periodic droughts and hazardous farming conditions are a result of increasingly erratic precipitation, marked by high intensity, short-duration precipitation often associated with severe soil erosion. Snowfall during winter months of May-July is a common occurrence especially in the coldest region - the Mountains. Due to its altitude, the country remains cooler throughout the year than most other regions at the same latitude. Lesotho has a temperate climate, with hot summers and cold winters. Maseru and its surrounding lowlands often reach 30°C in the summer. Winters can be cold with the lowlands getting down to -7° C and the highlands to -18° C at times. The mean summer temperature is about 25° C and the mean winter temperate about 15° C.

Demographic features: The population of Lesotho is estimated at 1.88 million. In 1996, however, the population census estimated the population to be 1.84 million people, suggesting that the growth rate had gone down from 2.8% in the 1976 - 86 periods to 1.5% in the 1986 - 96 periods. The growth dropped further between 1996 and 2006 to 0.1%¹. Population distribution by ecological zones shows that most of the population is concentrated in the Lowland region. Population density increased from 53 people per km² in 1986 to 61 people per km² in 1996, and 62 people per km² in 2008. The density on arable land increased from 569 people per km² in 1986 to 588 people per km² in 1996. The landless are, therefore, compelled to migrate to the urban centres resulting in a myriad of social problems. According to the national 2006 population census, literacy rate has dropped to 66 percent in comparison with the censuses and surveys during which literacy rate was estimated at 80% in earlier years. It is still higher for females than males and it declines with increase in age².

Economy and its growth: Domestic economic growth was estimated to have slowed down in 2011 following a robust expansion in 2010. This mainly reflected varying patterns of subdued performance in all the main sectors of the economy. The secondary and tertiary sectors recorded 6.3 per cent and 2.9 per cent, respectively, while the primary (agriculture) sector registered 3.9 per cent in 2011. Real GDP growth was estimated at 4.3 per cent in 2011 compared with a revised 5.6 per cent in 2010. The primary sector grew at a slower rate of 3.9 per cent in 2011 compared with 4.0 per cent in 2010. The growth of the industry was largely underpinned by the strong recovery of the mining and quarrying sub-sector at the back of the surge in diamond prices during the year. The agriculture, forestry and fishing sub-sector contracted at an estimated rate of 1.8 per cent in 2011 compared with a strong growth of 10.9 per cent in the previous year. The contraction resulted from poor performance of the crops sub-sector, which was largely affected by heavy rains, floods and storms experienced during the 2010/2011 agricultural year.

It is estimated that close to 76% of households in Lesotho live in the rural areas and 70% derive all or part of their livelihoods from agriculture. Therefore, the contribution of this sector is of critical importance in determining livelihoods and the socio-economic conditions in Lesotho. The country's limited arable land together with a mountainous topography, variable climate and severe erosion constrain the agricultural sector to generate adequate levels of employment and incomes to support the increasing population, thereby aggravating the poverty situation over time. The unfavourable

¹ Bureau of Statistics. 2008. Statistical Yearbook. Government of Lesotho.

² Bureau of Statistics. 2006 Population and Housing Census Socio-economic Indicators. Government of Lesotho.

climate conditions in Lesotho have been found to be related to many indicators of poverty amongst rural and farming households. Despite the poor performance of agriculture, Lesotho still regards agriculture as having a critical contribution to the economy. It is believed that targeting agricultural development by enhancing its productivity is a potentially effective way of addressing the poverty situation in Lesotho.

Agricultural production trends: Lesotho's crop agriculture is dominated by maize, which accounted for 64% of the area planted in 1998/99. The other major cereal crops are sorghum, occupying a planted area of 14% during 1998/99, while wheat followed with a share of a planted area of 12% in the same year. Pulses occupied a share of area planted amounting to 10% in 1998/99. These are the most sensitive crops in terms of supporting the livelihood of the majority of the population in food security. The lowest total areas under cultivation were in 1990/91 at 136 500 hectares down from a high of 450 000 ha in 1960. It was 219 133 ha in 1998/99; and it has continued to drop, reaching 124 032 hectares in December 2011, representing a significant decrease of 39% below the previous season³.

The yield estimate per hectare for maize in 2011/12 season was 140kg per hectare, 78% lower than in the previous season. For 2012/13 cropping season, the total area planted to maize was 114 543 ha showing an increase of 17.25% compared to 97, 711 ha of the previous year. Generally, the total area under cultivation, production levels, and crop yields are very erratic, a factor much related to rainfall and inadequate capacity for resilience. Therefore, the country is heavily dependent on imports to satisfy the local demand for major staple crops, and quite frequency on donor support during the most critical periods of food deficit caused by droughts.

In the period 1960 to 1965 Lesotho's average annual grain production was 232,600 metric tons, the average yield per ha was 0.812 metric tons and average annual imports were 12 400 metric ton. In the period 2006 to 2010, the average annual grain production had fallen to 108 800 metric tons (a fall of 53%), average annual yield per ha was only 0.612 metric tons (a fall of 25%) and average annual grain imports had risen to 155 000 metric tons. In the same period the average area of grain harvested annually had fallen from 287,000 ha to 178 000 ha, a fall of 40%. Production for the 2014/15⁴ is estimated to be 85,774 metric tons (mt), for maize, 12 401mt for wheat, and 5,170mt for sorghum. Total national cereal requirement for this period will be 344 594 mt. Domestic production can only 30% of this demand, at 186 595 mt. The decline is attributed to late planting operations.

Forestry: There is no comprehensive and updated data on the extent of tree cover in Lesotho. However, it is generally known that the country is one of the least forested in Africa. Although the indigenous forests are of low occurrence they remain a very important resource to rural communities by providing fuelwood, construction material, medicine, forage and shelter. However, despite various efforts on conservation the destruction of this natural vegetation continues unabated, although the rate of depletion has not been ascertained quantitatively.

Lesotho is a grassland country, and does not have large natural forests. The Government through the Ministry of Forestry and Land Reclamation has embarked on woodlots projects throughout the country, aimed at afforestation and reforestation. Forest plantations account for 49,000 ha; while woodlands (indigenous forests) are estimated to cover 97 000 ha.⁵ The total land cover under forests is, therefore, 146 500 ha. Anecdotal evidence indicates: "*As the human population of Lesotho increased through the 1800s and 1900s, so the forest and shrubland patches and riparian vegetation were increasingly denuded in the ongoing quest by local people for firewood and building material.*"

³ Lesotho Vulnerability Assessment Committee. 2012. Lesotho Food Security and Vulnerability Monitoring Report. Disaster Management Authority, Prime Minister's Office.

⁴ Lesotho Vulnerability Assessment Committee. 2014. Early Warning Bulletin (in Lesotho Times dated July 17 -23, 2014). Disaster Management Authority, Prime Minister's Office. Maseru

⁵ Ramanyaka, T., Principal Forestry Officer (Research). 2014. Personal communication. Department of Forestry

*Today, very little remains*⁶. In the Sehonghong/Mashai area inhabitants are said to have experienced thick indigenous tree covers of *Cheche (Leucosidea sericea)*, *Lelotheoane (Buddleia salvifolia)* and willow (*Salix capensis*). Programmes to re-stock these would be a desirable undertaking.

Livestock and rangelands: Cattle, sheep and goats which are raised extensively on communal rangeland dominate the livestock sector. Cattle are mainly used for subsistence which includes draught power, milk, fuel sources, socio-cultural uses and ceremonies. Sheep are of the merino type and raised for the sale of their wool, slaughter and for ceremonial purposes. Goats are of the angora type and are mainly kept for their mohair. Horses and donkeys are kept for human transport and transportation of goods. The largest single monetary contribution to cash income from livestock is that provided by the sale of wool and mohair followed by sale of live animals.

Livestock numbers have fluctuated over the years reaching a peak in 1986/87. In 2010, cattle numbers were 626 343, sheep around 1 228 557 and 813,792 goats⁷. Livestock herd sizes are mainly controlled by natural factors such as fertility and mortality than planned management. In recent years, livestock theft has caused great concern among livestock farmers as it has become a common occurrence, not only in the mountain areas, but all over the country.

The major problem facing the livestock sub-sector is overstocking which has resulted in range degradation. It is estimated that Lesotho is overstocked by about 24%⁸. The communal nature of rangelands, that lacks the governance impetus to ensure that grazing management strategies are enforced effectively, is one of major contributing factors to the problem of overgrazing. For this reason, empowerment of user groups through formation of grazing associations presents itself as a viable option.

As a result, sheep production has dropped from 3 million kg in 1976 to slightly over 2 million kg in 1996, and yield from 2.9 kg to 2.4 kg per sheep during the same period. The decrease in mohair production has been comparatively smaller between 1988 and 1998 period, fluctuating around 1 kg per goat with a total production of 0.6 million kg. Mohair yields in South Africa average at about 2 kg per head (Government of Lesotho and African Development Fund, 2000). Poor nutrition associated with degraded range resources is responsible for low livestock productivity. The average lamb/kid survival rates are low at about 40%. Intensive livestock production is potentially well suited to Lesotho conditions as it poses little threat to environmental degradation, while at the same time having potential to bring greater returns per unit area of land. Dairy farming and poultry and rabbit farming are some of the intensive livestock production practices with potential in Lesotho.

Land tenure: Land administration in Lesotho has for a long time been governed by a dual system of customary law and the more formal statutory administration. The former was more prevalent in the rural areas while the latter was more applicable in urban areas. This dual system became increasingly problematic as the intersection between urban and rural area grew with the expanding peri-urban area. Effects of improper land management as influenced by the current dual land tenure system (state and customary land tenure system) and the chiefs' involvement and such disempowered legal inclusion of chiefs as replaced by local government administrative structures is widely discussed.⁹ A series of measures to reconcile this dual system have been taken over the years culminating in the enactment of the Land Act of 2010. The main input into the act was the land policy review commission which

⁶ Boshoff, A. and Graham, K. 2013. Historical Incidence of the Larger Mammals in the Free State (South Africa) and Lesotho. Centre for African Conservation Ecology and Nelson Mandela Metropolitan University, Port Elizabeth, South Africa

⁷ Bureau of Statistics. 2010. 2009/2010 Livestock Agricultural Census: Livestock Report. Government of Lesotho

⁸ Palmer, A. R. 2013. National Monitoring of Processes of Landscape Change. Sustainable Land Management project, Ministry of Forestry and Land Reclamation.

⁹ Daemane, MMM (2012). Problems of land tenure system in Lesotho since post-independence: Challenging perspectives for sustainable development in land administration and management. Journal of Sustainable Development in Africa (Volume 14, No.8, 2012)

assessed the land tenure system and evaluated its appropriateness in relation to equitable access, security of tenure, improved land productivity and efficient administration.

In reviewing these policies and eventually enacting the law, Lesotho received substantial support from the development partners, notably the United States of America and the World Bank. Institutional reforms including establishment of key institutions like Land Administration Authority (LAA) were undertaken. LAA is now making major strides towards reconciling the long standing customary land allocations practices with the dictates of the new act. The gender discriminations that were so pervasive in the customary law are now being eliminated as women can now own and inherit land.

In as far as the agricultural land is concerned, the land act attempts to deal with the twin evils of landlessness and land hoarding by clearly stipulating how the agricultural land should be used and looked after. In theory any crop land that is not utilized over three consecutive years is according to the act considered abandoned and therefore due for reallocation to people that can put it to good use. While this provision is difficult to implement due to political reasons it does however discourage land hoarding by speculators.

Whereas the legislative process have been useful in opening up land for commercial transactions and ensuring security of tenure for all gender groups, the entrenched customary practices in the rural areas will take time to give way to the espoused statutory practices. For instance, in most rural areas land rights for cropping are only respected over the cropping season. After harvest, communal grazing rights generally take over as livestock owners allow their animals to roam freely and graze on crop residues. This presents a major challenge for introducing and adopting conservation based production technologies such as Conservation Agriculture which requires controlled management of crop stubble. A lot of effort is therefore needed to gradually wean farming communities from their customary practices and help them abide by the dictates of the current statutes.

B. Climate change vulnerability and problems the project will address

Watersheds in Lesotho are severely affected by increasing climate variability. Watersheds in most vulnerable livelihood zones face threats of land degradation and declines in agricultural production. The major livelihood activities of the watersheds are dominated by the crop and livestock production sub-sectors. The agriculture sector contribution to the Gross Domestic Product (GDP) has declined from over 20 percent in the 1980s to the current 8 percent. This is partly attributed to recurring droughts and weather extremes, poor crop, livestock and rangeland management practices in watersheds. Approximately 90 percent of the farmers are subsistence growers, producing mainly for domestic consumption with little surplus for the market. Well over half of the rural population, extremely dependent on subsistence agriculture, lives below the poverty line.

The livestock sector is crucial for income generation, farm operations and food security of the rural population especially in the foothills and mountain watersheds. This sector is a major contributor to the country's GDP through production of wool, mohair, meat and milk, but is entirely dependent on communal grazing. About 70 percent of Lesotho's land area is rangelands. The annual soil loss from rangelands is estimated at 18 tonnes per hectare per year compared to 20 tonnes per hectare per year of soil lost from cropland.¹⁰ Overgrazing and the recurring droughts have reduced the regenerative capacity of grasslands and range resources, negatively affecting the carrying capacity as well as the number and quality of livestock. The impacts are likely to worsen under projected climate change scenarios.

Chronic food insecurity is a defining feature of poverty in the watersheds of Lesotho. The root causes of the problem are linked to the low levels of agricultural productivity and crop failures attributed to climate variability and extreme events and associated issues: land degradation and soil erosion, inefficient water control and management. In the decade 1995/96 to 2004/05, on average 33 414 ha of

¹⁰ National Resource Inventory of Lesotho. Ministry of Agriculture. 1988.

planted area (\approx 30-50%) failed each year: in the lowlands (17 069 ha), in the mountains (9 248 ha), in the foothills (5 180 ha) and in the Senqu River Valley (1 915 ha). Consequently, Lesotho is currently heavily dependent on imported food, estimated at 60 percent of its annual cereal demand. The 2006/07 growing season recorded one of the most severe droughts in the recent past. While the 2010/11 season was characterized by the worst floods in recent memory, the 2011/12 season started with a drought extending from the spring into the mid-summer of 2011 and seriously threatened the staple food production outlook for 2011/12. An analysis of crop yield time series from 1973/74 to 2009/10 indicated that yield levels are even less in recent years compared to the late 1970s owing to increased vulnerability to climate risks. The major reasons could be attributable to poor crop, livestock and natural resources management, in addition to inefficient use of agricultural inputs.

The underlying climate related causes of the watershed degradation and loss of livelihoods would be further fuelled by the projected **climate change** impacts on major livelihood zones of Lesotho supporting arable farming and livestock production. For example, according to the Lesotho Meteorological Services, models predict a temperature increase of 1.0 to 1.5 °C in 2030 and 2050. In the Second National Communication, climate change scenarios for annual temperature and seasonal precipitation for 100 years from the year 2010 through to 2100 were modelled.

Temperature predictions anticipate a gradual increase in annual mean temperature change ranging from 0.4 - 4.7°C in the north and variations from 1.6 - 3.8°C in the south by the year 2100. Overall, summer precipitation in the north will be slightly above normal for all scenarios while the southern region precipitation will be below normal. Autumn will experience an above normal precipitation in both northern and southern regions of the country. On the other hand, below normal winter precipitation for both the north and the southern region are predicted with the northern region showing a significant drop below normal.¹¹

As indicated in the most recent FAO studies, regardless of the various scenarios on climatic variability, frequency and intensity of extreme events, the majority of households in Lesotho are vulnerable to the slightest change in climate and it is crucial to create more awareness and action amongst policy-makers about the implication of changes in temperature and rainfall to the country's food security and well-being in the coming decades. The precipitation projections for Lesotho are significant and likely to have severe impacts on water resources, rangeland management and agriculture as the growing season is pushed forward and perhaps shortened. Furthermore, climate change might threaten the already declining staple grain production and further degrade rangelands in lowland, foothills and mountain areas.¹²

Climate change will also have detrimental impacts on the watersheds in the country already ravaged by recurrent droughts. This will, in particular, affect the wetland resources in the alpine zones of the mountain watersheds which sustain the perennial flow of the rivers and supply water to the Lesotho water development projects both in the highlands and lowlands. Moreover, high temperatures, reduced precipitation and climate variability could exacerbate incidences of soil erosion, land degradation and loss of valuable natural resources at watershed scale. The latter would also affect the lifespan and sustainability of the water development infrastructure. However, smallholder and subsistence farmers are even more highly vulnerable to a slight shift in climate variability. Hence building resilience at watershed scale is the first step towards national food security.

There are a number of institutional and systemic barriers to dealing with climate change risks in Lesotho. The NAPA listed inadequate capacity of national and local institutions and communities, and shortage of human resources with requisite skills as some of the major barriers to the implementation of climate change adaptation programmes and practices. Thus there is an urgent need for the

¹¹ Ministry of Energy, Meteorology and Water Affairs. 2013. Lesotho's Second Communication to the Conference of Parties of the United Nations Framework Convention on Climate Change. Maseru

¹² Dejene A., S. Midgely, M.V. Marake and S. Ramasamy. 2011. <http://www.fao.org/docrep/014/i2228e/i2228e00.pdf>. FAO Blue Book Series. Rome, Italy.

strengthening of technical expertise of national and local institutions and communities on climate change adaptation options to effectively respond to climate impacts, as well as for evaluating and prioritizing best practices in areas of sustainable land and water management, water harvesting, crop-livestock interactions, agro-forestry and rangeland management.

C. Institutional and policy framework

Institutional frameworks

The key Government Ministries involved with project implementation are: the Ministry of Forestry and Land Reclamation (MFLR), Ministry of Agriculture and Food Security (MAFS); Ministry of Local Government and Chieftainship (MLGC); Ministry of Energy, Meteorology and Water Affairs (MEMWA); and the Disaster Management Authority (DMA). In recognition of the cross-sectoral nature of climate change issues, Lesotho has adopted an all-inclusive approach which brings together multi-disciplinary expertise into a common purpose through regular consultations, workshops and seminars. The country has established the National Climate Change Committee. In addition to the sector partners and agencies, the Disaster Management Authority is an important stakeholder in terms of responding to potential disaster situations resulting from climate change.

National Environment Council (NEC): Cabinet has recently approved the establishment of NEC, comprising several ministers and various stakeholders, and chaired by the Minister responsible for the environment. The NEC is responsible for: Drafting environmental policy, harmonizing policies, plans and activities of government departments, ensuring coordination among stakeholders engaged in environmental protection and review and approve environmental impact assessments.

National Committee on Agriculture and Food Security: This committee comprises of Principal Secretaries for MFLR, MAFS, MLGC, MTICM, and chaired by Principal Secretary (PS) Ministry of Development Planning (MDP). Also the PSs and Ministers for Ministry of Trade, Industries, Cooperatives and Marketing (MTICM) and MAFS, meet monthly.

Ministry of Forestry and Land Reclamation (MFLR): The Ministry of Forestry and Land Reclamation (MFLR) is composed of three line departments: Forestry, Range Resources Management and Soil and Water Conservation. Its core mandate is to protect and rehabilitate the physical environment through forestry, management of rangeland resources, control of soil erosion and harvesting of water. The Ministry also ensures an enabling legal and regulatory framework to *enhance* sustainable natural resource management and food security. The proposed institutional arrangements for the department of Range Resources Management consist of a policy level advisory and coordination at the national level and policy implementation at the district and community levels.

There is a three-tier structure: National Grazing Association committee (NGA) at the national level; District Grazing Association Committee (DGA) at the district level and Grazing Association Committee (GA) at community level. There is currently a proposed structure which comprises of the district and village land management committee. The structure includes the Soil and Water Conservation, MEMWA, MLGC, and MAFS.

Ministry of Agriculture and Food Security (MAFS): The Ministry of Agriculture and Food Security comprises of the Departments of Livestock Services, Crops, Research and Agricultural Planning. The Ministry's core mandate is to develop national policies on agriculture and food security, management of crop and livestock issues, promote irrigation efficiency and water conservation in crop production, and manage agricultural research, information and extension services. The Ministry provides data on agriculture and environment through satellite linkage to the Africa Monitoring of the Environment for Sustainable Development (AMESD), and contributes to crop modelling and vulnerability mapping. It also provides training on climate risk management, and

research into adaptive technology, as well as resilient crop and livestock opportunities. The Department of Agricultural Planning serves as the National Livestock Policy Focal Point (or the hub).

The Irrigation Section in the Engineering Division of the Crops Department of the Ministry of Agriculture and Food Security (MAFS) is involved in the investigation of new irrigation technologies that can be applied in Lesotho. Its maintenance and repair workshop has the capacity to repair irrigation equipment. There is a lack of appropriate equipment for planning and design. Irrigation services are available from a number of departments and units in MAFS but are uncoordinated and poorly resourced. The Engineering Division of the Crops Department of MAFS itself provides planning, design and implementation support for, amongst many others, irrigation.

The Agronomy and Horticulture Divisions of the Crops Department of MAFS also have direct links to irrigation development. The Department of Soil and Water Conservation the MFLR is involved in irrigation development regarding dam planning, design and construction. The Division has qualified staff engaged on small dam design and implementation. The Extension Division of the Department of Field Services of MAFS is involved in irrigation through its decentralized District Agricultural Offices (DAOs). The Agricultural Research Division of the Department of Field Services of MAFS has an Irrigation Unit in its Engineering Section. One of its aims is to provide smallholder farmers with appropriate irrigation technologies and services to improve irrigation systems. The Unit is currently designing the Ram pump which uses kinetic energy to pump water.

Ministry of Energy, Meteorology and Water Affairs (MEMWA): The Ministry of Energy, Meteorology and Water Affairs comprises of the Lesotho Meteorological Services, the Departments of Water Affairs (Wetlands Unit), the Rural Water Supply (DRWS) and the Water Commission. MEMWA is responsible for developing national policies on Water and management of water resources. The DWA is responsible for general administration of the water sector, as well as data collection, and analysis. The Department of Rural Water supply (DRWS) is mandated to supply water to rural communities in Lesotho. The Commissioner of Water is mandated to promote coordination of programmes and activities within the water sector.

The Lesotho Meteorological Services (LMS) provides information on climate trends and predictions to support planning and implementation of effective response through integrated and comprehensive approaches to climate change adaptation. LMS acts as the Focal Point for climate change-related projects, functioning as Climate Change Secretariat, and with links to the WMO, IPCC and UNFCCC. LMS has submitted the First and Second National Communication to the Conference of the Parties to the UNFCCC which described the national circumstances, vulnerability to the impacts of climate change, and various sectoral adaptation and mitigation strategies.

The Ministry of Local Government and Chieftainship (MLGC): The Ministry of Local Government and Chieftainship promotes, deepens and consolidates a sustainable and effective system of local governance for improved service delivery. The ministry supports and strengthens local councils in providing quality services which include sustainable land management and administration. At district level there are District Councils (DCs), and Community Councils (CCs). The functions of the local Councils include the regulation, control and administration of natural resources, land allocation, grazing rights, fire protection, environment, forestry and agricultural improvement and village water supplies. Councils can establish committees, including a Finance Committee.

The Disaster Management Authority (DMA): The Disaster Management Authority (DMA) falls under the Prime Minister's Office and is responsible for conducting annual vulnerability assessment to assess vulnerable areas/ food insecurity. DMA manages the early warning system and responds to potential disaster situations resulting from climate change; it also coordinates and mainstreams disaster risk reduction actions, participates in vulnerability mapping and revises disaster management plans. DMA has established Disaster Management Teams at district and village levels; and provides training on disaster risk assessment and reduction (village Disaster management Team)

National University of Lesotho (NUL): The National University of Lesotho promotes national advancement through innovative teaching, learning, research and professional services through the Faculties of Agriculture and of Science and Technology. The University produces graduates in agriculture, natural resource management, and climatology and undertakes climate change-related research. The academic programmes include Hydrology and Water Resources Analysis, Management and Conservation of Soils, Rangelands, and Improvement of Agricultural Productivity.

Development partners: The emergency coordination structure of the United Nations system in Lesotho is the UN Disaster Risk Management Team (UNDRMT) which includes WFP, FAO, UNDP, UNICEF, UNFPA and WHO. The UNDRMT provides regular updates and coordinate on-going activities, challenges and achievements. Also on a monthly basis, the UN emergency coordination meets with Disaster Management Authority and relevant sector working groups. The UNDRMT in cooperation with the Government of Lesotho (GOL), through the Disaster Management Authority (DMA) has prepared the coordinated response plan including a rapid response and an emergency and recovery plan.

Policy frameworks

National Forestry Policy (1997): The policy of the Government of Lesotho is to maximize the contribution which forests can make to the alleviation of poverty, livelihood security and environmental protection in Lesotho and to enhance participation and contribution of women with regard to the following objectives and guiding principles: production and employment, environment protection and biodiversity conservation, forest protection, management and people's participation, public awareness, education and training, forestry research and gender issues in forestry development. At the district level, District Forestry Officers (DFO's) are responsible for implementing the Forest Policy and the National Forestry Programme. Other cooperating institutions are the relevant area-based NGOs, schools, other Government Ministries/Departments and the villagers and/or community-based Organisations (CBOs).

The decentralisation framework (2006) defines roles, responsibilities and procedures for planning budgets, resource allocation and project implementation. Under these guidelines, the District Planning Unit (DPU), the District Development Coordination Committee (DDCC), and the District Planning Office (DPO) are responsible for the planning process at the district level. The District Planning Unit is a forum of line ministry heads of division (HODs) that is convened by the District Administrator (DA). Its functions are to provide planning services for councils, to consider the councils' draft development proposals and to prepare district development plans for submission and discussion at DDCC. The District Development Coordinating Committees (DDCCs) are responsible for prioritizing and coordinating district plans. The District Administrator acts as the secretary to the DDCC while the District Council Secretary (DCS) acts as the secretary to the District Council. The District plans are submitted to DPU and forwarded to central government but the budget is allocated sectorally. This creates a gap in needs driven budget allocation.

National Strategic Development plan (NSDP) 2012/2017: The NSDP has integrated NAPA issues and identifies the following as primary areas of focus: Reversing land degradation and protecting water sources through integrated land and water resource management, improving national resilience to climate change, promoting biodiversity conservation, increasing clean energy production capacity and environment-friendly production methods and exploring opportunities for carbon trading, improving land use and physical planning as well as increasing densification and ring fencing of towns to avoid human encroachment on agricultural land and other fragile ecosystems, improving the delivery of environmental services, including waste and sanitation, and environmental health promotion and improving coordination, enforcement of laws, information and data for environmental planning and increasing public knowledge and protection of the environment

The National Range Resources Management Policy (Draft 2014): The National Range Resources Management Policy is still under review by the Ministry of Forestry and land Reclamation as such it

should be understood that there may be changes before it is approved by Cabinet. The policy identifies the key problems that affect the productivity of the range resources as: 1) Poor legislation enforcement, 2) Poor grazing controls, 3) Reduction in area of rangelands, 4) Uncontrolled wild fires, 5) Degraded rangelands, 6) Ineffective institutional arrangements, 7) Fragmented legal instruments and 8) Out-dated range resources management policy and legislation.

The stated policy goal is “to attain sustainable development and management of rangeland resources for the enhanced biodiversity, optimum productivity and improved livelihoods of the present and future generations”. The key objectives of the policy are: to raise public awareness and promote community and wider stakeholders’ active participation in rangeland resources management; to develop and implement efficient and effective strategies to avert land and vegetation degradation; to improve and maintain productivity of rangeland resources at optimum level so as to promote ecosystems balance; to rehabilitate and improve the quality of rangeland so as to enhance productivity of livestock and wildlife habitat; to conserve and increase the availability of native plant species for economic, social and cultural utilisation; to protect water resources and improve the water quality and yield; to enhance the aesthetic beauty of the landscape to increase opportunities for sustainable recreation and ecotourism; to improve income opportunities and quality of life of the rural communities; and to promote disaster, risk reduction, gender equity, as well as HIV and AIDS mainstreaming in range resources management. The policy identifies the following five priority areas: sustainable management of rangeland resources, conservation of biodiversity and maintenance of ecosystem, rangelands monitoring and research, maintenance and protection of wetland areas, and socio-economic dimensions.

The policy further recognizes that rangelands and range resources are part of the broad environment; as such management of the environment, and protection and conservation of the biodiversity is a shared national responsibility. The Ministry of Forestry and Land Reclamation, through the Department of Range Resources Management, will be custodian of this policy, and will work with relevant line ministries responsible for Agriculture and Food Security, Natural Resources, Mining, Tourism, Environment and Culture, Local Government and Chieftainship Affairs, Justice, Human Rights and Rehabilitation and Law and Constitutional Affairs, Education and Training, Home Affairs and Public Safety, Gender and Youth, Sports and Recreation, Public Service, and their corresponding institutions/agencies to ensure harmonisation of the policies and streamline implementation. The Ministry shall also coordinate the implementation initiatives by the private sector, NGO’s and community based organisations.

The document further proposes a three-tier structure comprising the National Grazing Associations Committee (NGA) at the national level, District Grazing Associations Committees (DGA) at the district level, and Grazing Associations Committee (GA) at the community level. The key mandate of NGA shall be to advise MFLR on policy and implementation strategies. The composition of the NGA shall be drawn from District Grazing Association, MFLR Senior Management, Local Government, other relevant key Ministries, Development Partners, Committee and Educational and Research Institutions.

The DGA shall provide the strategic directions for the range resources programmes at district level. The DGA shall report and make recommendations to the NGA. Representation to the DGA shall be drawn from the Grazing Associations, MFLR, Local Government, other Line Ministries, Non-Government Organization and relevant Community Based Organization. The document further provides that the implementation of the above structures will recognise the existing structures, and recommend reviews where appropriate.

Soil and Water Conservation policy (draft 2013): The Soil and water conservation policy (2013) is under review by the Ministry of Forestry and Land Reclamation and relevant ministries, as such it should be understood that there may be changes before it is approved and implemented. The policy outlines the causes of soil erosion as poor rangeland management, poor crop husbandry, uncontrolled veld burning, alien invasive and unsuitable vegetation, heavy rains/storms especially on poorly

managed land, extensive social and economic costs associated with reducing soil erosion, and poor rangeland management.

The policy also reflects on the degradation of water sources through the encroachment on wetlands by uncontrolled grazing, poorly designed roads, cropping and overharvesting. The stated policy goal is: “to protect land and improve productivity of the country’s biological diversity resources, by conserving the natural resource base, while maximizing the potential for sustainable land management, using appropriate structural and biological techniques. The objectives of the Soil and Water Conservation Policy are to: Minimize soil loss and rehabilitate degraded lands; implement integrated watershed management approach in order to conserve catchment ecologic integrity and promote social and economic development; maximize public participation on soil and water conservation activities within catchments; and improve the management of water resources to ensure regular provision of water supply within catchments.

The policy identifies the following seven priority areas that will be addressed in order to achieve the overall policy goal: 1) Watershed management and rehabilitation of degraded land, 2) Development of appropriate soil and water conservation techniques, 3) Optimization of soil fertility and maintenance of long-term food production levels, 4) Conservation of water resources. 5) Regulation of land based developments 6) Soil and water conservation research, 7) Gender equality, involvement of youth, people with disabilities, and those with HIV and AIDS. The institutional arrangements envisage policy level advisory and coordination at the national level and policy implementation at the district and community levels. Consequently, the policy envisions a three-tier structure comprising of the national land management committee at the national level, district land management committee at the district level and village land management committee at community level.

1.2 RATIONALE

A. Baseline projects and investments

Background: In an effort to contribute to addressing the technical shortcomings cited in the NAPA and make progress on implementing priority adaptation needs, FAO and the Government of Lesotho have piloted a Technical Cooperation Programme (TCP) project “*Strengthening capacity for climate change adaptation in the agriculture sector*” from 2009 to 2011. The overall development goal of the project was to contribute to the reduction of risks associated with climate change and variability among smallholder and subsistence farmers in three selected watersheds covering three livelihood zones in Lesotho. The TCP promoted an integrated and community-based approach in addressing climate change risks through strengthening of technical and institutional capacity at national, district and local levels. The emphasis was mainly on identifying, evaluating, prioritizing and testing locally relevant adaptation practices, focusing on selected areas of crops, livestock and forest-based livelihood systems, to stabilize and improve yields. The TCP, through targeted training strengthened the technical capacity of staff at district and community levels to address these issues.

The TCP was implemented in three districts (Thaba Tseka, Mafeteng and Mohale’sHoek) identified in the NAPA as the most vulnerable to climate change and variability. Rantsimane, a sub-catchment of the Senqu River in Thaba Tseka, represents the vulnerable areas of the mountain ecological and livelihood zones. Thaba-Tšoeu Ha Mafa, a sub-catchment of the Tsoaing River in Mafeteng, is on the transition zone, between the foothills and the mountains. Mabalane, a sub-catchment of the Kolo-La-Pere River in Mohale’s Hoek, is in one of the drought prone parts of the southern lowlands of Lesotho. The two lowland sub-catchments also represent the densely populated rural areas of the country. Taken together, these three catchments represent a major transect of vulnerability ranging from the south western lowlands to the mountain zones of Lesotho, via a transitional site between the southern lowlands and the foothills.

The Programme was structured in three well-defined phases, with planned transitions from one phase to the next. The first phase involved the assessment of climate change related impacts and

vulnerabilities on crop, livestock and forest-based livelihood systems in the sub-catchments. Furthermore, baseline studies on local climate-related vulnerabilities and coping and adaptation strategies were conducted, validated at national and local levels, and documented. During the second phase, an inventory of potential suitable adaptation practices (i.e. crops, livestock, crop-livestock interaction and agroforestry) relevant to southern lowland and mountain ecosystems was undertaken, drawing from various sources, with particular focus on the pilot sub-catchments in view of their specific vulnerabilities. These adaptation practices were screened using key criteria, notably: (i) comparison with the list of potential adaptation measures options suggested in the NAPA document; (ii) enhancement of both productivity and ecosystem services, and (iii) capacity to address drought risk management. Finally, field demonstrations were conducted on key potential adaptation practices identified above, for farm level application. All these practices are very well received by the local communities and have a very good potential for up-scaling in the three identified most vulnerable livelihood zones with a holistic perspective of Integrated Watershed Management Programme.

Baseline Programme (co-financing projects):

Integrated Watershed Management Programme: This programme, funded by the Government of Lesotho, is an on-going programme, since 2007 to-date. It supports the afforestation and rehabilitation of existing forest resources, rehabilitation and construction of water conservation infrastructures, protection of wetlands and reseeded of degraded rangelands. All the activities are aimed at enhancing food security in the short-term, through employment creation, and in the long-term through rehabilitation of degraded lands for sustainable production. Thus, it focuses on creating temporary employment for local communities to enable them to have access to food, through increased purchasing power as a result of earning wages.

The overall goal of the project is to rehabilitate degraded lands with an objective of arresting soil erosion and improving agricultural productivity. The objective, on the other hand is creation of temporary employment by engaging individuals in local communities in the rehabilitation of degraded lands. Each of the 80 political constituencies throughout the country identifies three micro-catchment areas for rehabilitation works annually. However, the investments are not considering climate change impacts and vulnerability, which is crucial to ensure sustainability in the long-run.

Components of the project are closely related to activities of the three departments of Ministry of Forestry and Land Reclamation (MFLR): i) Rehabilitation of existing forest reserves; ii) Engagement of forest rangers; iii) Purchase of tree seedlings from local farmers; iv) Planting of fruit trees along contour bunds; v) Bee-keeping for honey production. Soil and water conservation activities are: i) Rehabilitation of gullies through the construction of silt traps and check dams; ii) Construction of terraces and waterways; iii) Construction of dams; iv) Construction of roof/storage tanks; v) Re-seeding of degraded marginal fields. Range Resources Management activities were: i) Protection of wetlands through the sensitisation and training of herders; ii) Removal of invasive plants such as *Chrysocoma* species (*Sehalahala*); iii) Reseeding of degraded rangelands; and iv. Declaration of the areas to development purposes to ensure their protection from livestock grazing.

One of the main challenges is to sensitise and engage the communities in the rehabilitation of degraded lands, with a view to reaching sustainable natural resource management. The programme, by working through all structures of local government, ensures that communities are in charge of reversing erosion, tree planting, improving marginal lands and protecting water resources. Impacts of the Project with respect to the primary objectives of poverty alleviation and food security through rehabilitation of degraded lands, for a period of five years from 2007 indicates the potential opportunities if climate change impacts and vulnerabilities are considered explicitly. This gap will be addressed through the LDCF project.

The GEF LDCF will support additional activities especially to reduce the impacts of climate risks and build more robust sustainable land and water management technologies at the community level. Tested sustainable land and water management practices including soil erosion control, soil and water

conservation, water harvesting, run-off reduction, vegetative cover and range resources management will be promoted within the communities.

FAO-supported project: FAO is supporting an initiative “Capacity building in agribusiness development” that aims to enhance the capacity of Lesotho National Farmers’ Union (LENAFU) and the entrepreneurial skills of farmers’ organizations at national, district and field level in agribusiness management and marketing to enable them to better respond to market opportunities. It also aims to strengthen farmer-to-farmer cooperation and exchange of innovative practices and technologies. This will involve: providing training in leadership management, financial management, group promotion and other critical skills, ensuring active participation of women and other social groups in decision making roles and bodies; training farmer leaders and farmers in agribusiness development and management and to use, manage and adapt improved techniques, technologies and methods, including those related to conservation of natural resources, integrated pest management and appropriate post-harvest technologies, storage, processing and marketing. This project presents a very good opportunity to complement the agribusiness training with capacity building on climate resilient practices targeting this important group of stakeholders.

B. Remaining barriers to addressing climate change threats and vulnerabilities

Inadequate technical and institutional capacity: Despite the extreme form of vulnerability that is found in Lesotho today, and the growing interest by policy makers on issues of climate change, the country has not yet developed a climate change policy to support planning for national adaptation. Consequently, the country is unable to respond to challenges posed by climate change in a coordinated manner especially on improving diversified livelihood strategies at household level to reduce the loss due to climate risks and enhance sustainable land and water management (SLM/W) at watershed scale.

Similarly, several institutions recognize that failure to integrate climate change in the actions and measures that aim at addressing national development priorities tends to weaken the achievements of many noble initiatives. These institutions are not able to take action because of lack of capacity that cuts across all the issues referred to in the preceding text..

Insufficient information on climate vulnerability and risk: Several institutions are involved in collecting data and information that can be utilized to assess vulnerabilities and impacts. Currently, most of the information gathered is not translated appropriately into vulnerability and risk assessments. This results in institutions not utilizing the relevant data which may impact their livelihoods and health. Lesotho has a decentralised administration system with districts, community councils, agricultural resource centres and sub-centres. Community councillors, extensions officers are not in position to assist the communities they serve because they have not been provided with information on climate change impacts or crop suitability in different timescales. Furthermore, there is lack of a feedback mechanism through which primary users of information or beneficiaries could inform the packaging and targeting of appropriate forecasting.

Lack of experience with innovative resources management practices: Lack of experience with new and innovative technologies at community level is one of the barriers hampering widespread introduction of new practices. There are technologies such as conservation agriculture being introduced to manage extreme events such as drought. There are, however, challenges with low rate of adopting conservation agriculture. These challenges include: the labour intensive nature of the work involved, difficult access to inputs, communal grazing of crop residues despite the legislation that prohibits the practice, namely, legislation in the Range Management and Grazing Control Regulations of 1980, as amended. Permanent soil cover is not easy to attain as demanded by conservation agriculture. In addition, soil is heavily compacted upon by livestock, making it difficult for implements, especially hand-held planters or hoes, to penetrate in the next planting season.

In-adequate sensitisation and training of herders and livestock owners on range management and livestock husbandry practices: Issues related to range management and livestock production are intertwined due to heavy dependence of the latter on range forage resources. The barriers that affect introduction of innovative range and livestock management practices are: (I) in-adequate sensitisation and training of herders and livestock owners on range management and livestock husbandry practices; (ii) lack of integration of innovative grazing management systems and (iii) poor introduction of intensive livestock systems that exclude grazing, implying the necessity to, first produce surplus food from croplands for human consumption, then growing fodder on marginal lands in an agroforestry system. These barriers and unsustainable practices cause land degradation and inadequate resource base for promoting diversified livelihood strategies including agro-forestry systems and alternate tree crops.

C. Additional cost reasoning

Additional activities that will be financed by the LDCF include promotion of livelihood diversification and demonstration and adoption of improved adaptation practices in order to reduce vulnerability and enhance adaptive capacity. The adaptation interventions will be focused on sustainable land and water management (SLM/W) practices at watershed and community level, diversified livelihood and improved income generating activities at the household level. The project will be implemented in three most vulnerable districts following the agro ecological-zone approach. The component wise additional LDCF activities are described below:

Component 1: Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and diversified livelihoods in selected vulnerable livelihood zones

The proposed project will improve technical expertise of national, district level MFLR, MAFS, MEMWA, Disaster Management Authority, Ministry of Local Government, and National University of Lesotho staff on climate change adaptation especially focusing on household level livelihood diversification and sustainable resource management and conservation. An effective adaptation response to climate change can only result from the efforts of the institutional and technical capacity on climate change adaptation.

Sustainability of outcomes related to capacity development activities is always an issue. To ensure sustainability and continuous use of improved technical capacity, the training programmes and resources will be integrated into the regular training activities of the Government in each of the Ministry. In addition, all capacity development activities will be conducted in close involvement of National University of Lesotho (NUL) so that the government can access resource persons to organize similar training programmes even after completion of the project. The implementing partners will select appropriate trainees based on their involvement in capacity development programmes.

The LDCF project will train at least 150 government staff at national and district level. In addition, the LDCF resources will be used to train the local representatives from community based organizations (CBOs) on good practice examples of adaptation especially on livelihood strategies focusing on crops, livestock and agro-forestry, and sustainable land and water management (SLM/W) and soil and water conservation (At least 24 farmer groups (1 200 farm households) in selected watersheds of three livelihood zones. The LDCF project will complement the baseline project aimed to strengthen the national farmers union.

Component 2: Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale

Activities under this component will focus on improvement of databases, tools and methods for assessment of vulnerability and risks specifically in collaboration with the Disaster Management Authority (DMA). The project will provide training to at least 30 core staff at the Ministry of Forestry

and Land Reclamation (MFLR), Ministry of Natural Resources and the Ministry of Agriculture and Food Security which should lead to better interpretation of land use and land suitability database. Additional 10 staff in each district (30 total) will be trained on risk and vulnerability assessment, and translation into adaptation actions. In addition, a comprehensive risk and vulnerability assessment for current and future period will be updated for the 3 livelihood zones. The vulnerability and risk assessment and spatial information products to be generated will be critical for designing adaptation practices under component 3 and 4.

Component 3: Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds

The proposed LCDF project will introduce and transfer Sustainable Land and Water Management (SLM/W) and conservation measures and climate-resilient practices to enhance adaptation in 24 communities in three livelihood zones. Water conservation techniques and soil management practices to control soil erosion and enhance resource conservation (e.g. conservation agriculture, Machobane Farming System, zero tillage and other minimum disturbance techniques) in watershed scale will be promoted based on the existing and future climate risks.

The project will analyse and propose adjustments to cropping practices and systems applicable at different temporal and spatial scales. Short-term adjustment will explore practices to optimise production without major system changes. These include changes in planting dates and cultivars, changes in external inputs, water conservation and land use management practices. The long-term adjustments or major structural changes may include changes in land allocation, enhancement of irrigation efficiency and changes in farming systems and land use due to farmer's response to the differential crop suitability under climate change.

Furthermore, the proposed LCDF project will also introduce improved soil conservation measures, improved vegetation cover and innovative range resource management measures. Introduction of crop varieties tolerant to heat and water stress and better compatibility to new agricultural technologies e.g. crop varieties with higher "harvest index" will help maintain irrigation efficiency under conditions of reduced water supplies or enhanced demands. Crop substitution may be useful also for the conservation of soil moisture e.g. some crops use less water and are more water and heat resistant, so that they tolerate dry weather better than others.

Component 4: Strengthening diversified livelihood strategies and dissemination of improved income generating activities at the community level

The prominent options for diversified livelihoods in Lesotho are crop - livestock, agro-forestry systems, agri-horticulture systems and small scale income generating and livelihood diversification activities. Animal production and management (focusing on wool and mohair on mountain ecosystem and dairy in lowland areas) in the long term will be successful. Livestock should be integrated with cropping activities to diversify the risks. The baseline projects described above focuses on broader deforestation related issues. A holistic approach combined with a robust community participatory analysis is needed to build diversified livelihood systems.

The proposed LCDF project will focus on Agro-forestry and agri-horticulture systems in smallholder rural areas that retain wild fruit trees in their fields. The trees serve as a source of fuelwood (dead branches) and provide shelter, fodder for livestock and food. These agro-forestry systems can serve as windbreaks and also serve as a source of fuel wood, timber and in some cases, veneer wood. Sometimes the orchards are under-planted to pasture in order to include a livestock enterprise. There are additional benefits for the local communities from beekeeping component within the orchard. The LCDF will support farmers to grow fodder tree and shrub species in "fodder banks" for livestock. These trees also provide other benefits such as fuel wood and poles that can contribute additional household income.

Component 5: Dissemination of best practices, project monitoring and evaluation

This component will cover development of a communication strategy and ensure dissemination of good practice examples and case study results for wider adoption. National level replication foresees development of a communication strategy in close collaboration with the MFLR, MAFS and other implementing partners. The communication and dissemination strategy will review current mechanisms and prepare detailed guidelines for communication of project results and good practices. Case studies will be documented and will be compiled into simple documents for dissemination among the stakeholders. Dissemination of land use data will be ensured through customized database to be developed in the Ministry of Forestry and Land Reclamation (MFLR). The vulnerability and risk information products will be hosted and disseminated through the Disaster Management Authority.

The proposed LCDF will also support establishment of a monitoring and evaluation system to monitor impact and outcome indicators, including LCDF/SCCF Adaptation Monitoring and Assessment Tool (AMAT) indicators (Attached separately). It will include mid-term and final evaluations, and wide dissemination of best-practices to facilitate their scale-up by the Government and non-government organizations.

1.3 FAO's COMPARATIVE ADVANTAGE

FAO has been implementing several projects in Lesotho in the field of agriculture, food security, disaster preparedness and emergency response. FAO's comparative advantage for the proposed project lies in its long-standing experiences working with the Ministry of Agriculture and Food Security and Ministry of Forestry and Land Reclamation on issues related to climate variability and climate change. The project draws on lessons learned from a project on "Strengthening Capacity for Climate Change Adaptation in Agriculture" technically assisted by FAO to the Government of Lesotho¹³. Through this project, FAO has supported identification of viable adaptation options in agriculture. The project included development of technical and institutional capacity, and adaptation practices in three districts. Several FAO's ongoing and pipeline programmes are complementary to the proposed project and will build on already established institutional systems.

FAO's activities are guided by a clear targeting policy which ensures that they reach poor rural women and men, who are usually the most vulnerable to climate change. FAO's operations are consistent with national priorities especially on sustainable agriculture and food security. The proposed project matches with FAO's comparative advantage in capacity development in agriculture. FAO has been supporting Lesotho's efforts to develop more resilient agriculture systems and national food security strategies. Technical support will be provided locally from the national level expertise and also from FAO decentralized offices in the region and from headquarters.

1.4 PARTICIPANTS AND OTHER STAKEHOLDERS

The MFLR will be the National Focal Point and facilitate the implementation of the Project. In this capacity MFLR will work closely with the relevant departments of the Ministry of Agriculture and Food Security (MAFS), Ministry of Energy, Water and Meteorology (MOEWM) and Department of Environment (DOE) and the Disaster Management Authority (DMA) and the National University of Lesotho. The National Project Steering Committee (NPSC) constituted as part of the Technical Cooperation Project (TCP) funded by FAO with representatives of the above-mentioned line ministries chaired by the Principal Secretary of MFLR will be sustained through the proposed LDCF.

¹³ Dejene A., S. Midgely, M.V. Marake and S. Ramasamy. 2011. Strengthening Capacity for Climate Change Adaptation in Agriculture: Experience and Lessons from Lesotho. FAO Blue Book Series. Rome, Italy. Weblink: <http://www.fao.org/docrep/014/i2228e/i2228e00.pdf>

The collaborating ministries and/or departments shall be represented in the NPSC by ranking officers of at least a director-level position to expedite consultation and authoritative decision-making. The NPSC will be responsible for reviewing overall progress of the Project and provide the administrative decision-making to overcome constraints during implementation.

The district level protocols for implementation will be made in consultation with the district authorities and community based organizations at the local level. The district structures will oversee the day-to-day activities of the project and provide overall guidance on the implementation of the project activities. The key stakeholders and beneficiaries of the LDCF include:

- the direct beneficiaries will be approximately 3 000 rural households living in three selected catchments covering lowland, mountain and foothills livelihood zones identified as highly vulnerable by the NAPA process. An additional 1 500 to 2 000 rural households could be indirect beneficiaries;
- a team of technical staff drawn from the Ministry of Forestry and Land Reclamation, the Ministry of Agriculture and Food Security, the Ministry of Energy, Water and Meteorology, Department of Crops, Department of Livestock, Lesotho Meteorological Services, Department of Rural Water Supply, Department of Water Affairs, Agricultural Research Department and the Disaster Management authority will be trained and will play a catalytic role to implement the project and scale-up the activities to the similar areas in the country and ensure sustainability;
- the relevant government agencies in the three selected districts (Quthing, Mafeteng and Thaba-Tseka) will benefit from enhanced capacity in addressing location-specific climate change risks and development of alternative adaptation options. In these districts, local authorities and communities will be trained;
- National University of Lesotho will be engaged to provide improved risk reduction and adaptation practices. This will facilitate effective research and development linkages.
- bilateral and multilateral agencies and NGOs (E.g. OXFAM) working in agriculture and food security and natural resources management would have access to evaluated tools and methods including the information and knowledge on impacts, vulnerabilities and adaptation practices.

1.5 LESSONS LEARNED FROM PAST AND RELATED WORK INCLUDING EVALUATIONS

Strengthening Capacity for Climate Change Adaptation in Agricultural Sector (FAO-TCP)

The objectives of the FAO's Technical Cooperation Project (TCP) were: to promote an integrated and community-based approach to addressing climate change risks by strengthening the technical and institutional capacity of key stakeholders at national and local levels and to evaluating and prioritising best practices focused on selected areas of crop, livestock and forest-based livelihood systems. The major outputs included - climate change-related impacts and vulnerabilities on crop, livestock and forest-based livelihood systems in the three major livelihood zones of the country assessed and produced, and baseline studies on local climate-related vulnerabilities, and coping and adaptation strategies documented and produced.

An inventory of suitable location-specific adaptation practices documented, and field demonstrations conducted on selected adaptation practices for farm-level application and up-scaling and training programmes to strengthen technical capacity to address climate-related vulnerabilities and risks provided at national, district and community level, and suitable adaptation strategies and practices in agriculture-based livelihood (i.e. crops, livestock and agroforestry) promoted. The project life was for 18 months from 2009 to 2011 for an amount of USD 372 000 in three livelihood zones: Rantsimane in ThabaTseka (Mountain), Mabalane in Mohale's Hoek (Lowland) and Thaba Ts'oeu in Mafeteng (Lowland). The experiences from the project are described below.

Achievements, constraints and lessons learned:

- Community demonstrations were implemented in all the pilot sites. However, it was not possible to explore all emerging issues within the duration of the project. Activities were further affected by inclement weather conditions, which prevented many agroforestry and cropping option demonstrations. Several important issues need to be taken into account to facilitate the institutionalization of success stories and their expansion to other communities and districts nationwide.
- The project timelines for implementation and phasing-out activities were insufficient. Responses to seriously mismanaged rangeland and herd development require implementation timeframes far exceeding those of the project. Follow-up projects will therefore need to support MFLR and MAFS to strengthen existing or planned programmes in this regard. Project timelines should be reviewed at this stage to ensure successful implementation and a transition to sustainability. Although project activities were institutionalized into their respective district departmental portfolios, the lessons to be drawn from screening and demonstration studies would have been more useful if these had taken place during the project.
- With regard to sustainable implementation at community level, two modes of engagement were feasible in the context of the project. The first was a **communal approach**, especially for issues of rangelands, community woodlots, trees on pasture and rangelands. The second was **intervention at individual household level**. On both counts, it was critical that there be full involvement by the community and beneficiary households from the outset. The project engaged strongly with the communities during inception and momentum towards full participation was accelerated through the on-farm demonstration phase. At the end of the project, measureable and sustainable results were already evident in some livestock and agroforestry systems. The challenge is now to scale up from the pilot experiences. As the scaling-up phase could not be carried out within the pilot phase timelines, there is a need for a follow-up project to facilitate community engagement beyond the pilot sites.
- The aim of the project was to adopt a systems-based approach transcending sectoral interests. In this regard, it is particularly important that all relevant and stakeholder ministries are adequately briefed and committed to achieving the project objective through collaboration. In the context of this project, MAFS was core to the interventions and, although improvement was possible, the extension services of the Ministry recorded a commendable performance in institutionalizing activities at district, resource centre and community levels. Climate change resilience-building will be most effective when approached in an integrated systems-based manner. Within the context of agricultural and rural development, urban- and rural-focused authorities must find improved ways of collaborating in order to develop the necessary value chain for agricultural inputs and outputs, and create a market economy at district and national level. The building and strengthening of supportive infrastructure and financial mechanisms to link the rural economy to a modern urban-driven market economy will require a much longer-term effort than that envisioned by a follow-up project.
- A high degree of reality in devising feasible activities and outcomes rooted in the local context was core strength of the project. The focus on community-based adaptation strategies should ensure that science-based responses are embedded in local knowledge, practices and circumstances (both biophysical and socioeconomic), that they are understood, wanted and implemented by farmers participating in the project, and that they lead to improved livelihoods. Community participation in baseline studies and validation processes, followed by community involvement in the demonstrations, helped to ensure that outcomes were rooted in the local context.
- Many development projects based on grants have fostered the development of a “**hand-out mentality**” or “**dependency syndrome**” not only in Lesotho but in many other developing

countries in the region. The granting of credit that requires re-payment, on the other hand, tests the commitment and practical orientation of a farmer and is closely linked to long-term sustainability. The project favoured the latter approach, which was supported by communities and farmers in all three pilot sites during the baseline and validation processes. However, implementation of the pilot demonstration required the provision of some support to farmers in order to spread and reduce the risk burden. In addition, if the choice of farmers participating in the project is based on their ability to afford to test the technologies recommended, the project might be perceived as intended only for those who have the means and would also require a longer time period for incubation. Follow-up projects should continue to wean farmers from grant-dependency to independent implementation.

- Success needs to be measured if it is to be scaled up to other communities; conversely, the up-scaling of mistakes and absence of benefit should be avoided at all cost. Monitoring and evaluation (M&E) procedures should therefore be undertaken concurrently with project implementation. The first phase of the project included baseline studies that were subsequently validated, providing the basis for future M&E and evidence of positive change. M&E is a key component that should not be compromised by financial or time constraints.
- It is known that poverty makes communities more vulnerable to climate change. It has been argued that women in the south are more vulnerable than men to the effects of climate change. Creating an explicit link between gender and poverty, it is suggested that women are generally poorer than men and depend more on the primary resources that are most threatened by climate change, especially in agriculture. Women also bear the burden of caring for the sick and, as increased levels of sickness are expected to result from climate change, will bear the costs of climate change disproportionately. It is crucial to consider whether the particular vulnerability of women to the effects of climate change is for economic reasons, as a result of greater poverty, or social reasons, as a result of women's specific roles and responsibilities.
- It was felt that analyses of vulnerability should explicitly recognize poverty as the primary variable, because of the preponderance of evidence at global and local levels that it is the poor who will suffer most from loss of livelihood related to gradual climate change, and also from sudden disastrous climatic events (such as floods and droughts), as they have little scope for adaptation, resistance and insurance. This would seem to override most other considerations. Most gender-specific characteristics that make people vulnerable to climate change (heavy dependence on local natural resources, lack of alternative income possibilities, responsibility for care of the sick, and so on) are characteristics of women in societies of extreme poverty such as Lesotho. It is important, therefore, to recognize that poverty is not gender-neutral. This project sought to understand and highlight the particular gender aspects of climate change vulnerability of the poor and it is hoped that such recognition will lead not only to more efficient programmes for dealing with the effects of climate change, but also to greater gender equity.
- The project also sought to ensure that the above principles informed all climate change vulnerability interventions undertaken in the context of the climate convention. It took a gender-sensitive approach to such interventions as indigenous poultry, the use of covered-roof water-harvesting tanks to provide drinking water to the household, and agroforestry interventions addressing food security, income generation for women and fuel-wood concerns.

Challenges and recommendations

- It is **recommended** that the programme be replicated over much wider areas of Lesotho. Adaptation to climate change may take place at different temporal and spatial scales. At the temporal scale, there may be short-, medium- and long-term adaptation options and, at the

spatial scale, household-, district and national-level options. The project piloted certain practices at household level and these should be carefully evaluated before being scaled up to community or district level. Up-scaling depends on adapting innovation to suit the end users – both farmers and institutions – under variable conditions. This will require an understanding of the principles underlying the innovation, achievable through capacity-building and greater investment in time and financial resources than was available under the project. If this is not taken into account, the tested practices and technologies may remain isolated.

- The options available to the project made it impossible to enter the planting season without prior studies of the current understanding of such adaptation in the communities. In addition, the targeted training of both communities and implementing partners determined the nature of entry points in both time and space. In order to successfully achieve both horizontal (more farmers and communities) and vertical (institutionalization) up-scaling, strategic catalytic projects are required to follow up and raise awareness of the successes achieved in the pilot communities.
- Some of the priority adaptation practices that were identified and screened for piloting in the three districts required a minimum of two stable agricultural seasons to show tangible results. The project also experienced an unusually rainy growing season and an extended early season drought, which shifted the planting season to late summer. These circumstances made it difficult to showcase promising climate change adaptation practices and technologies. It is recommended that, in the future, long-term perspectives be preferred to short-term surgical interventions and initiatives that motivate the need for follow-up projects.
- On the technical intervention side, challenges were encountered in the agroforestry and livestock aspects of the project. Agroforestry interventions required more than two years to be fully explored. In addition, the project collected information on native tree and shrub species for woodlots, fodder banks, and live fences and hedges, with the aim of using this information to recommend species for pilot sites in the 2011 planting season; this proved impossible. Follow-up projects should thus conclude such partially implemented initiatives to secure the overall impact of investments.
- The selection and testing of suitable dual-purpose fodder species and varieties for farmers who would otherwise not be interested in planting fodder only for animals would require an additional planting season. It is recommended that the selection and testing of fodder species form part of the activities of follow-up projects. In all three pilot catchments, a recommended livestock option was the introduction of hardier dual-purpose chickens for both food security and income generation. In order to be sustainable, this requires a nutrition and health plan, including vaccinations against common chicken diseases in the area. It is recommended that such support be provided. Finally, follow-up projects should ameliorate the effects of conventional technology-focused approaches that do not take into account the systematic participation of farmers and that lead to low adoption rates and, as a result, the low impact of pilot investments.

Sustainable Natural Resources Management Project (SANReMP)

Goal was to improve food security, family nutrition and incomes for households in the programme area – Mafeteng, Mohale’s Hoek, Quthing. The purpose of the programme was to secure the sustained increase in agricultural production and productivity through investments that: promote the effective delivery of core support services responsive to the needs and priorities of poor rural households; promote agricultural diversification and intensification with due attention to sustainable natural resource use and management; and strengthen institutional capacity of the decentralized district administrations as the focal points for programming, implementation, monitoring and evaluation; and empower local communities through Participatory Community Planning (PCP) processes. The project

was implemented in three districts of Mafeteng, Mohale'sHoek and Quthing at a total budget of USD 13.7 over a period of six years (2005 – 2011).

The key lessons learned:

Crop production under the traditional rainfed farming (TRF) system in the southern districts of Lesotho is a complex undertaking. More efforts are needed by the MAFS research and extension services, together with development partners, NGOs and the private sector, to develop innovative and viable crop production systems. Keyhole gardens and conservation farming, which have been developed by NGOs in the southern districts and which are most popular in the southern districts, are examples that this is possible. Machobane Farming System was not implemented as designed.

It is recommended that skills in the technique be developed among relevant district staff. Farmers do not favour the system, citing labour intensiveness and conflict with communal grazing systems, which makes it difficult to grow off season crops. The MFS is labour intensive, and extension staff lack knowledge on the system. Practical training rather than theoretical training on the MFS is needed to be able to translate training into action.

There exists a potential for low cost, small scale irrigation systems, including low-pressure, gravity-fed sprinklers. The design of community or group-based production systems, such as community gardens and irrigation schemes, should include much attention to formation of a formal group, with a constitution, a management committee, a fund for operation and maintenance, and a system to ensure productive use of the land owned by old, poor, sickly or absent farmers when they are not cultivating their land. Training on group organization, business and marketing aspects, should complement training on production.

There exists a potential for fruit trees and fruit production in the southern districts, which are prone to drought. Fruit trees are perennials that can withstand drought conditions to some extent. Preferably, fruit production would be combined with interventions to improve water availability, for example using roof water harvesting, and effective water use, for example drip irrigation.

Involvement and performance of the extension service was critical to the successful implementation of programme activities, but was below expectation. To improve this situation requires: (i) a better understanding of the programme on their part, the objectives, strategies, expected results, and the role they have to play; (ii) the required technical competence on aspects of crop and livestock production, which was sometimes too low to provide effective support to farmers; (iii) resources; (iv) management.

The fact that the programme design only mentioned small stock and cattle, has contributed to missing critical considerations, such as access to markets and services, for intensive livestock production activities including layers, broilers and pigs. In the future, a broader set of possible livestock interventions should be considered at the design stage, linked to the target group.

The pass-on system for intensive livestock production has not performed particularly well, and may have left some beneficiaries worse off than they were before. Future interventions should prioritize people who already are in a similar business, especially for poultry and piggery projects. Targeting of beneficiaries was not always well considered, which contributed to the failure of some activities, for example piggery at Ha Ramosootheroane and Likhutlong in Mohale's Hoek. The distribution of breeding stock to WMGAs for increased production and productivity of small stock has a potential for success, but must carefully consider the genetic quality of ewes that are intended for improvement, and joining ratios which have a significant bearing on lambing percentages.

The construction of new shearing sheds, in combination with training of shearers and classers, was highly relevant in addressing the constraints of livestock farmers. Long distance travel to existing shearing sheds was effectively reduced and with that, livestock mortalities and other risks. The

advantage of shearing on time was realized: efficient clip preparation, packaging and timely consignment means more returns to the farmers because of reduced marketing costs and catching the market at its peak.

An integrated watershed management approach would have been more effective than isolated programme activities scattered over a large geographical area. A small sub-catchment such as Sekhutlong in Mohale's Hoek, could have served as a good example for the implementation of different conservation and production-related activities in a coordinated manner, to demonstrate how these activities relate and can reinforce each other. SANReMP has been implemented in the same areas where the government's poverty relief programme was being implemented, using paid labour. It is not realistic to expect the target group to work for free under such circumstances. It is, however, gratifying that in the areas where work was done through voluntary labour, there is evidence of better recovery of the natural resources, most likely because of SANReMP's capacity building efforts.

Land and water management activities such as construction of small dams, reseeded of rangelands and structural soil conservation measures are generally considered to be public works which do not benefit individuals and do not yield benefits in the short term. For example, there will typically be a waiting period of at least three years before livestock can graze a reseeded area. It is difficult especially for poor households to devote their time to such activities when they don't get paid. However, paid labour is not a solution. Implementation of soil conservation measures, including Food-for-Work and the Lesotho Fund for Community Development which is paying people for their labour, only show short-term results due to lack of maintenance afterwards. Sustainable farming practices on crop land need to be well integrated and implemented concurrently with the conservation efforts if success is to be achieved.

Soil and water management initiatives that are implemented by individual households, such as tree nurseries, and those that are implemented by groups that have come together based on a shared interest, as is the case with range management under a Grazing Association, have a better chance of success than activities which are implemented and looked after by the overall community. The communities involved in implementation of land and water management activities understand the reasons for engaging in such activities and the benefits. Community awareness and capacity building was well integrated, which has been a key success factor under SANReMP. However, most training was one-off, which is not enough to ensure sustainability. Capacity building should be a continuous process that matches the different stages of programme delivery, so that the beneficiaries can establish relevance as they go along.

Long term maintenance is directly related to local governance structures. In areas where the Chief and the Councillor work closely together to issue grazing permits and close off areas for land recovery, the land and other natural resources are in much better shape than in places where this is not the case. Long term monitoring and support by districts and headquarters is needed to ensure that maintenance of conservation works is properly integrated with production strategies. This function has not been effectively put in place.

The most successful activities have been those that were identified by individuals or the community themselves; cases where people were already trying to improve production by themselves before receiving external support; activities that are part of the existing farming system or that can easily blend with the existing farming system; and activities that demonstrate positive results within a short period of time. Targeting can be across the spectrum of the rural population, including landless and (below) subsistence farmers.

However, the more variation there is among the target group, the more complicated implementation becomes, because programme interventions must match the level of resources, skills, and interest that is typical for the different segments of a broader target group. Under SANReMP, most interventions were standard and not carefully matched to the correct beneficiaries, which has been a major reason why certain activities have not been sustained.

Beneficiary contribution is an important way to ensure that only capable and committed farmers are supported. Without clear criteria for beneficiary selection, requirements for beneficiary contribution, enforcement of the rules and data collection on actual contributions made, farmers may show interest only because the programme is distributing handouts and may not take responsibility for the assets they receive. This happened under SANReMP, which reduces impact and sustainability.

Training conducted was not sufficiently based on training needs assessment and as such is likely to have missed addressing some knowledge and skills gaps of staff and farmers. Focused training, guided by clear and relevant training modules and materials, is essential for enhancement of the technical competence of staff and farmers. The necessary modules and materials were not developed, in spite of recommendations to that effect. One-off training courses and classroom-based training without field practice are not effective: skills need to be built up through repeated training, with related modules, refresher training, and field practice that complements theory.

One of the biggest disruptions has been frequent staff transfers, which has negatively affected the quality of activities, supervision and reporting under both the MAFS and the MFLR. It could have served SANReMP well to have a few technical specialists included in the PCMU, to provide technical direction and backstopping, and to ensure continuity and reduce disruptions caused by government staff movements. Introducing sophisticated accounting packages such as FINPRO at district level for management of programme finances is not effective given the high staff turn-over. Such packages can be useful for a management unit, with districts allowed to use standard financial management tools of government.

Sustainable Land Management (SLM) Project

The goal of this Full Scale Project (FSP) is that sustainable land management provides a strong base for sustainable development in Lesotho while providing a range of global benefits to the region. In order to overcome these barriers and address the corresponding programmatic gaps, the specific objective of this FSP is that, supported by a knowledge management network, Lesotho is equipped at local and national levels with the techniques, approaches, capacity and strategy for upscaling successful SLM in support of national biodiversity conservation, food security and poverty reduction strategies. The project is implemented in the Community Council of Makhoalipana in mountain area around Semonkong, Maseru. It is 110,000 ha in size. The cost of the project (without co-financing) USD 2.344 million contributed by GEF, UNDP and Government of Lesotho over 4 years, with 'no-cost extension' to five (2010 – 2014).

The SLM model addresses the approach through four modules. These are the governance, the **SLM techniques**, the **alternative livelihoods** and the **support services** modules. The **governance module** focuses predominantly on the question of community-based natural resource management based on the lessons learned from the rangeland management interventions spanning a period of 30 years. This is because the issues that are seen with rangeland degradation are due to inadequate and dysfunctional governance structures for the management of communal lands. The **SLM techniques** module examines the full suite of possible interventions, from soil and water conservation techniques to range management techniques, forestry techniques and agronomic techniques.

These are very much in common with the SCCCA-IWM project. The enhanced and alternative **means of livelihood module** looks at the overall constraints in the area and examines and makes recommendations for a number of specific income generating activities of promise. The final substantive module looks at support services for rural livelihoods such as agricultural extension, livestock marketing, wool and mohair marketing, livestock registration to combat stock theft and enhance development of livestock population data base for rangeland management purposes. Monitoring and evaluation of the programmes are a vital element that should provide feedback and introduction of timely remedial actions. The key lessons learned from the project are:

Key Performance Indicators (KPIs) were set at unachievable levels. The process by which the KPIs were set during project development was not documented or justified based on research either within Lesotho or elsewhere. It is vital for the project to have challenging but attainable targets if a robust assessment of project performance is to be formed. Setting the indicators at unattainable levels predestines the project to failure. These were: 250,00 ha under SLM without due consideration to various constraints such as difficult accessibility due to rough terrain, inclement weather and other unforeseen eventualities; at least 50% increase over the baseline on social and economic indicators for households, such as diversification of incomes, reduction in poverty index, reduction in food vulnerability, etc.; the country to attain at least a 75% score on Composite Index for the SLM Enabling Environment¹⁴ against the baseline as measured by policy changes, availability of finance resources to address SLM at national level, functionality of SLM institutions etc.; and 25% improvement in vegetative cover. While the target was reduced to 10%, the result of the assessment for monitoring a change in the final year of the project scored 5 – 10% increase; almost similar to studies elsewhere in the country.

Study tour of the Chiefs, Councillors and project beneficiaries had a very positive impact in terms of learning and being enthused into doing better than seen in other areas. It is very desirable to integrate activities of the project, with well-defined roles and functions at district level. Functional relationship between government district staff and subject matter specialist at head office level should be made clear from the onset. This will ensure continuity and sustainability of activities. Project site staff should be well resourced in order to remain effective and in touch with the beneficiaries on regular basis. This must apply post project life, with support to be provided by government.

Project Steering Committee ought to make well informed decisions, and this requires them to visit the project site regularly, at least half yearly. Formation of Project Implementation Forum was a very plausible move because it provided feedback, interaction and exchange of views and ideas in a robust manner. It was formed at district level comprising Principal Chiefs, Community Council members and Council Secretary for Makhoalipana Council, District Coordinator (MFLR) and other staff, District Agricultural Officer and other MAFS staff, Local Government (Council Secretariat), Home Affairs (Livestock Registration) community-based organisation, representatives of grazing association committee and project management unit (UNDP office included).

For the first time, Small Grants Programme of the UNDP provided funds to grazing associations in the project area for various activities including purchase of breeding stock (rams). One of them went out of their way to buy more rams than had been offered under SGP. With little assistance, they were enticed to surpass the offer from the donor. The association purchased 10 on their own, when SGP had helped purchase 2 per group.

Amelioration of conflicts within the project communities was experienced: At Ts'enekeng, in one of the meetings with the Steering Committee, a beneficiary's testimony revealed that in the past, women were fond of gossiping about one another, where they gathered to draw water from a village well. That habit had changed because they then were more engaged about development issues around the SLM project activities. As a result conflicts amongst each did not occur any more. On another case, territorial boundary dispute that had been simmering for years, very serious fatal killing of a Chief by residents of neighbouring villages brought project activities to a halt for months. Their involvement in project programmes that were so dear to their hearts had mellowed down the tensions between the warring communities. In addition, a conflict management training course for Chiefs, Councillors and grazing association leaders managed to have the situation brought under control.

The pass-on system that was geared towards spreading distribution of dual purpose chickens and pigs was administrated by the grazing associations in the selection of recipients and development of regulations governing the distribution, care and passing-on from household to household. What was

¹⁴ This is a tool developed by TerrAfrica to measure changes in policy enabling environment, contemporary SLM tool being piloted in Nigeria.

learned from Ts'enekeng was the imposition of penalties for members who lost the chickens and pigs through negligence. The regulation regarded these as a loan that had to be paid back by passing-on to others, failing which they were required to pay back and join the end tail of the queue for the next passing-on. It is expected that the system continues, even after the end of the project, to benefit all the households village by village.

Much as pass-on system for intensive livestock production is a common practice in most agricultural projects, SLM interventions include this as a way of reducing over-dependence on grazing animals that exert pressure and inflict damage to rangelands; consequence of low carrying capacity would stem from increased livestock population. The project design had not made an allocation of funds for implementation of this activity, except for a study that was done. Government funds were only brought in, late in the life of the project, as an alternative source after realising that GEF funds could not be used for grants. Funds must therefore be provided during the project design, if means of livelihoods for the beneficiaries are to be supported.

Within the Makhoalipana Community Council, nine grazing associations were formed. In the fourth year of the project life, a Project Implementation Forum decided to create an umbrella body to take over and sustain operations of their programmes. While it was recommended that government continue to support the Forum meetings, each association would contribute towards their participation. This was a commendable commitment that should be encouraged in the project.

1.6 LINKS TO NATIONAL DEVELOPMENT GOALS, PLANS, POLICY AND LEGISLATION, AND LDCF AND FAO'S STRATEGIC OBJECTIVES

Links to national development goals, plans, policy and legislation

The project will contribute to the three GEF LDCF/SCCF objectives: CCA-1: Reducing vulnerability to adverse impacts of climate change, including variability; CCA-2: Increasing adaptive capacity to respond to the impacts of climate change; and CCA-3: promote transfer and adoption of adaptation technology. The overall goal is to promote sustainable natural resources management and to support crop, livestock and agro-forestry systems to reduce vulnerability and enhance climate resilience.

The proposed project will promote both immediate and longer-term risk reduction and adaptation measures. Specific adaptation activities will be implemented to improve the sustainable natural resources management and climate resilience of the defined baseline activities. The LDCF proposal targets a number of priorities of the NAPA (2007) and is directly related to the two priorities:

- Improve resilience of livestock production systems under extreme climatic conditions in various livelihood zones in Lesotho
- Promoting sustainable crop-based livelihood systems in foothills, lowlands and the Senqu River Valley

The major focus of the project is to implement climate change adaptation measures at local level to reduce vulnerability of local communities and improve their livelihoods and adaptive capacity. Scaling-up and transfer of climate resilient measures will be considered. All major ongoing and pipeline initiatives of the Government, development partners are taken into consideration to enhance synergies and to avoid potential duplications.

The main existing framework for implementing climate change adaptation in Lesotho is the **National Adaptation Programme of Action (NAPA)** which identifies regions and communities vulnerable to climate change and has listed 11 adaptation priorities. The NAPA presents a foundation for integrating climate change considerations into National Strategic Development Plan (NSDP 2011)¹⁵. The LDCF will address key and urgent issues prioritized in the first two priorities/options

¹⁵National Strategic Development Plan. 2011. Ministry of Finance and Economic Planning. Government of Lesotho.

- Improve resilience of livestock production systems under extreme climatic conditions in various livelihood zones in Lesotho
- Promoting sustainable crop-based livelihood systems in foothills, lowlands and the Senqu River Valley
- Capacity building and policy reform to integrate climate change in sectoral development plans

The proposed LDCF project is consistent with Lesotho's development priorities outlined in the **National Vision 2020** (2001-03), the **Poverty Reduction Strategy** (PRS, 2003), the Agriculture Sector Strategy of 2003, the Food Security Policy of 2005, the **National Action Plan for Food Security** (NAPFS, 2006) and the **National Strategic Development Plan (NSDP: 2012 - 2017)**. The Government policies and strategies have in all cases emphasized the statement of food security, employment generation, combating environmental and natural resources degradation in order to meet the World Food Summit target of reducing the number of hungry people by half by 2015 which is consistent with MDG-1 and attaining environmental sustainability (MDG-7). The LDCF also targets sustainable natural resources management with a view to reduce the vulnerability and enhance resilience.

The proposed LDCF links to regional programmes such as the **Comprehensive Africa Agriculture Development Programme** (CAADP) investment pillar on land and water management and increasing food supply and reducing hunger, as well as with the Africa Adaptation Programme. The UN Common Country Assessment (CCA) exercise in 2004 confirmed the long-term vision pursued by key Medium-Term National Planning Process such as the Poverty Reduction Strategy, the Agriculture Sector Strategy, the National Food Security Policy and the National HIV/AIDS Strategic Plan. It has been recognized that the country's food crisis has resulted from the nexus of poverty and natural resources degradation.

The Second National Communication to UNFCCC (2013) provides comprehensive and authoritative account of climate changes in Lesotho; which includes the strengthening institutional capacity and establishment of the multidisciplinary Steering Committee to lead the NAP process; forge greater technical and scientific cooperation; assist in the transfer, adaptation and acquisition of technologies; and increase popular participation in NAP implementation and evaluate and assess the impacts of the action programmes.

The implementation arrangements proposed in this project document are consistent with the structure of the National Desertification Steering Committee (NDSC) as presented in the Second National Communication to UNFCCC. A multi-disciplinary National Desertification Steering Committee (NDSC) has been established to advise and provide guidance on conservation, protection and sustainable use of the country's natural resources; and provide oversight in the transfer, adaptation and acquisition of technologies; and evaluate and assess the impacts of the action programmes.

The National Desertification Steering Committee (NDSC) committee includes National Environment Secretariat (Coordinator), MEMWA, MFLR, MAFS, MOLGC, DMA, National University of Lesotho. NDSC provides monthly reports on a progress regarding a number of issues including; land management, effective ways and means of reaching the grassroots communities; planning, implementation and monitoring of National, District and Local projects

However there are shortcomings in the structural arrangements; NES is a department of the Ministry of Environment with no authority over other departments and /or ministries dealing with the environment, as such its role can only be advisory. There is also a coordination gap in operational structures in the districts and local levels. The structures and their nomenclature have changed substantially over the recent years. Now at the districts have District Administrators instead of District Secretary. In addition, District Councils and Community councils have major role to play.

The district council is chaired by District Council Secretary. The district council have the membership consisting of departments at the district, selected number of representatives of the community councils and Representatives of NGOs. At the local level is the community councils, which are the planning structures at village level.

SLM/W investment plan (2014 – 2024): The proposed LDCF project is consistent with The SLM/W investment plan which identifies the following barriers to improved land management as the key driver of land degradation: 1) Low capacities at all levels; 2) Inadequacy of the extension service; 3) Lack of a programmatic approach to sustainable land management (SLM) - therefore SLM is not mainstreamed in development programmes and policies; and 4) Lack of funds to finance projects such as those proposed in the NAP. The goal of the Lesotho Sustainable Land and Water Management Strategic Investment Programme (L-SLWM-SIP) is to catalyse key sectors to co-operate to reduce land degradation, improve natural resources based livelihoods and restore ecosystem services, hence the country's capacity to adapt to the effects of climate change. The objective of the programme is to strengthen inter-sectoral co-operation in order to halt degradation, restore degraded lands and prevent future land degradation.

The L-SLWM-SIP will improve coordination and promote greater cohesion of service delivery to reduce duplication of efforts across the inter-related sectors. It will mainstream sustainable land and water management (SLWM) into relevant sector policies / strategies at national level, and harmonize policies through a joint multi-sector team of experts from GoL, NGOs, CBOs, donors, and private sector. At local level, the L-SLWM-SIP will support development of land use plans for SLWM, using a "bottom-up" approach starting with land users (individuals, village grazing associations), creating locally-owned plans, which will then be used to develop Community Council and District plans to ensure sustainable landscape and ecosystem functioning. The programme will catalyse adoption of SLWM technologies in the crop, range, wetland and forest / woodland ecosystems of Lesotho. These approaches have been proven at pilot levels in Lesotho, and include conservation agriculture, Machobane farming systems, agroforestry, and various soil and water conservation interventions.

In order to improve access to water for crop diversification and intensive livestock production, the programme will intensify household water harvesting and rehabilitate old ponds/ dams and construct new ones. The programme will also consolidate and rationalize the operations of various institutions that deal with issues of environment, water and soil conservation and land use. The program also provides instruments and mechanisms for innovative funding sources.

The Lesotho Agriculture and Food Security Investment Plan (LAFSIP – 2014 - 2018) is the medium-term strategic plan of the Government of Lesotho (GOL) aimed at achieving sustainable agricultural growth, poverty reduction and food security in the country within the framework of the New Partnership for Africa (NEPAD) Comprehensive Africa Agriculture Development Programme (CAADP). LAFSIP is fully aligned with the national goals of Lesotho National Strategic Development Plan (2012), Agricultural Sector Strategy (2006), the Subsidy Policy and the Food Security Policy (2005) and it has been informed by the National Forum on Agriculture and Food Security (2010) which reviewed the performance of the agriculture sector and explored ways for improvement.

LAFSIP has identified the following key challenges in the agricultural sector: 1) Climate change 2) Nature and structure of crop farming, 3) inadequate enabling environment for agricultural growth 4) poor rangeland management which reduces livestock productivity, 5) Land ownership 6) land and environmental degradation. The Overall Goal of LAFSIP is to contribute to Lesotho's accelerated and sustainable economic and social transformation process. The development objective aims to sustainably increase rural incomes and national food and nutrition security through commercialisation and diversification, sustainable use of natural resources, and reducing vulnerability and poverty reduction. LAFSIP covers all sub-sectors including crop and livestock development, small agribusiness development, processing, marketing and storage, and sustainable development of the natural resource base.

The LAFSIP also integrates investments in infrastructure, access to rural credit and strengthening land use planning and rangeland management. The investment plan has identified four strategic priority areas programmes for improving agricultural performance which are embedded in the proposed LDCF project: Resilient Livelihoods: Reducing Vulnerability and Managing Risk, Production, Productivity, Commercialization and Diversification, Sustainable Natural Resource Management, and. Human and Institutional Capacity Development.

CAADP Institutional Structure in Lesotho: The CAADP Steering Committee comprises of Principal Secretaries for Ministries of Agriculture and Food Security (MAFS), Ministry of Finance (MoF), Ministry of Development Planning (MoDP), Ministry of Trade, Industry, Cooperatives and Marketing (MTICM), Ministry of Local Government (MLG), Ministry of Forestry and Land Reclamation (MFLR), President of Lesotho National Farmers Union (LENAFU), Chief Executive of Private Sector Foundation of Lesotho (PSFL) and Executive Director Lesotho Council of Non-Governmental Organizations (LCN). This committee was the overseer of the whole CAADP process and the CAADP Country team reports to this committee for policy guidance during the CAADP implementation process.

The CAADP Country team drives the implementation process, and comprises of the Government Ministries, NGOs, NUL, Development partners, and farmer organizations. These include MAFS, MOF, MDP, MFLR, Disaster Management Authority (DMA), MTICM, Ministry of Energy Meteorology and Water (MEMWA), MLGC, LENAFU, LCN, PSFL, FAO, World Food Programme (WFP), and the National University of Lesotho (NUL).

Conservation Agriculture Strategic Framework (2012 – 2017): The proposed LDCF project recognizes Conservation Agriculture as the appropriate strategy for ensuring increased, efficient and sustainable agricultural production and land management in the farming systems of Lesotho. The objective of the CA strategy is to leverage the inclusion of CA in the national food security policy and strategy, promote sustainable agricultural production through practice of CA principles and appropriate technologies for smallholders and semi-commercial to commercial farmers to the extent that at least 50% of the arable land is under conservation agriculture in 20 years.

In the short to medium term, the CA strategy aims at 1) Increasing the yield from the current 0.5 tons per ha in conventional agriculture to 5.0 tons per ha on CA fields. 2) Increasing carbon sequestration through improvement in soil organic matter levels by 6% (0.5 to at least 3.0 % in CA fields and 3) Improving soil quality and health through reduced land degradation, reduced soil erosion and fertility and improved water conservation in CA catchments. The strategy also focuses on promoting coordinated and harmonized research and extension within the agricultural sector; and training extension personnel within MAFS and NGOs in CA.

Links to FAO's Strategic Objectives

This Project is aligned with FAO's Global Strategic Objective 2 (SO2): Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. The Project's focus to help local forest user groups improve their forest management practices while benefiting their own livelihoods will contribute in particular Organizational Outcome 1 (OO1) under SO2: Producers and Natural Resource Managers Adopt Practices that Increase and Improve the Provision of Goods and Services in the Agricultural Sector Production Systems in a Sustainable Manner. In addition, the Project's work to strengthen the relevant policy framework in Lesotho will contribute to SO2, OO2: Stakeholders in member countries strengthen governance – the policies, laws, management frameworks and institutions that are needed to support producers and resource managers – in the transition to sustainable agricultural sector production system.

The project fit into **FAO-Adapt**, an organization-wide framework programme launched in 2011. It provides general guidance and introduces principles as well as priority themes, actions and

implementation support to FAO's multi-disciplinary activities for climate change adaptation. FAO-Adapt provide an umbrella to FAO's adaptation activities, including short-term and long-term adaptation measures. FAO-Adapt aim to enhance coordination, efficiency and visibility of FAO's adaptation work. FAO's Interdepartmental Working Group (IDWG) on Climate Change and its subgroup on adaptation facilitate the implementation process of FAO-Adapt. Technical units in FAO Headquarters and decentralized offices lead the delivery of outputs and actions consolidated under the priority themes defined in the FAO-Adapt Framework Programme.

The Project is also aligned to, and contributing to, the “*FAO Country Programming Framework (CPF) (2013-2017)*”. In particular, it will contribute to the CPF's CPF Priority Area 4. Natural resource conservation and utilization including adaptation to climate change. The outcome 4.3 is related to climate change and institutional and technical capacities for adaptation to climate change in agriculture strengthened and adaptive capacity of vulnerable communities enhanced.

This includes four outputs: *Output 4.3.1: Improved policy advice and institutional capacity building*: Capacity building of national (institutions for climate change adaptation and policy advice and guidance in the integration of climate change priorities into agriculture and food security policies, programmes and action plans and support in the implementation of prioritized adaptation practices under the National Adaptation Programme of Action (NAPA)); *Output 4.3.2: Improved assessment, monitoring, disaster risk management* (Support in assessment and monitoring of climate risks and vulnerabilities, improvement of early warning systems and strengthening of capacities, and procedures for effective disaster risk management at all levels with emphasis on community based disaster risk management and facilitates integration to the longer-term climate change adaptation initiatives

The *Output 4.3.3: Improved community based adaptation approaches* to climate change in vulnerable districts and capacity building of local communities in the adoption of improved production practices, including adaptation innovations through ecosystem management and improved pasture, rangeland management and rehabilitation of degraded lands, promotion of Public Land and Private Land plantation and agro forestry to enhance coping capacity of farmers, and promotion of alternative energy sources and *Output 4.3.4: Improved knowledge management*, database of good practices, database on agriculture impacts of climate change on agriculture.

SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS

2.1 PROJECT STRATEGY

The proposed project will strengthen adaptation to climate change through **developing capacity of stakeholders** at national, district and local levels; with focus on addressing institutional, systemic capacity needs as well as individual skills gaps. At national level the project will build capacity in analyzing and developing relevant governance frameworks including policies, strategies, plans and programmes from a climate change lens. The project will ensure that climate change issues are mainstreamed into relevant frameworks using a gender-sensitive approach to planning. One of the key strategies will be to enhance coordination (horizontal, vertical, inter-sectoral), through a multi-stakeholder forum. This will ensure effective use of resources and coherent service delivery within and across the sectors and NGOs.

The project will **create awareness on climate change issues** among staff at central, district and community levels; as well as NGOs, farmer organizations and communities. Furthermore, information management will be strengthened through improvement of databases, tools and methods for assessment of vulnerability and risks; providing training on use of information; and interpretation of risk information and translation into adaptation actions to ensure that climate change information is sector-relevant and effectively disseminated.

The project will **promote resilience to climatic shocks** through development of skills and behaviour needed to overcome climate-induced changes in the environment through strengthening the capacity of the Disaster Management Authority to plan for, and mitigate likely future adverse impacts. The existing early warning system will be improved to provide useful climate risk information and analysis for planners, decision-makers, and farmers. A communication strategy will be developed and implemented to ensure effective dissemination of information from national to district and local level to promote informed adaptive behaviour at local level.

The project will promote **coordinated and harmonized climate related research and education**, improve linkages with regional and international research institutes, and provide training on research grant proposal writing for personnel within MAFS research department and NUL. Strengthening linkages between research, education and extension will ensure that outcomes of research initiatives are needs driven and effectively disseminated to communities for adoption.

At local level, the project will support improved **community based adaptation** approaches to climate change in 3 selected sites and capacity building of local communities in the adoption of improved livelihood strategies. The proposed project will also support implementation of land use plans, village water resource management plans, disaster management plans, range management plans, water and soil conservation and management plans, using a “bottom-up” approach starting with natural resource users (individuals, village disaster management teams, village water supply committees, village grazing associations, farmer organizations and women groups). The development of locally-owned plans will ensure ownership and sustainability; and will form the basis for development of Community Council and District plans.

By the end of the project, critical capacity will have been built through a strong cadre of national experts with broad understanding of the current and future climate scenarios; and more importantly improved capacity of local communities to continuously influence policy and development processes. The project will consistently document information, experiences and lessons learned and disseminate to a wide range of audience.

Rationale for selection of targeted livelihood zones and districts: Selection of target livelihood zones and districts are primarily based on the recommendations of the NAPA consultation workshops held throughout the country to assess vulnerable zones, identify communities at high risk of climate change and to formulate adaptation measures to ease climate change impacts on the vulnerable

communities. The consultation workshops were inclusive and key feedbacks were provided by the concerned stakeholders at the national, district and community levels.

Additionally, in-depth consultations were also carried out as part of the project preparation between March and July 2014 to come up with vulnerability zones considerations based on socio-economic indicators, agro-climatic conditions of the regions, climate change risks affecting the regions, poverty levels, population at risk, livestock statistics, drought severity and livelihoods. The assessment culminated into demarcation of the regions into three vulnerability zones namely; Zone I (*Southern Lowlands across the Senqu River Valley*), Zone II (*Mountains*), and Zone III (*Lowlands and Foothills*). The area under high climatic risk and also with poor socio-economic indicators denotes area of chronic vulnerability. A detailed description of the selected livelihood zones is presented in Annex IV.

2.2 PROJECT OBJECTIVES

The specific objectives of the project are: to implement sustainable land and water management practices (SLM/W) and resource conservation measures in selected watersheds to reduce vulnerability and enhance adaptive capacity at community level; and to strengthen diversified livelihood strategies focusing on crop, livestock and agro-forestry systems at community level in selected watersheds in three most vulnerable livelihood zones.

2.3 EXPECTED PROJECT OUTCOMES

Expected outcomes include:

- (i) Strengthened technical capacity in MFLR, MAFS, MEMWA, MoLGC, NUL and district and community representatives on sustainable land and water management
- (ii) Improved data, tools and methods for assessment of vulnerability and impacts of climate change on land suitability and land use at the national and district level focusing on most vulnerable watersheds;
- (iii) sustainable land and water management (SLM/W) practices (soil erosion control, soil and water harvesting, run-off reduction, vegetative cover, range resource management) successfully tested and adopted in selected watershed and catchments;
- (iv) communities aware of improved livelihood diversification and small-scale and household level income generation practices through wide dissemination at the community level;
- (v) Project implementation based on results based management and dissemination of best practices and lessons learned for future operations.

2.4 PROJECT COMPONENTS AND OUTPUTS

Component 1: Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and climate-resilient livelihood strategies

Outcome 1.1 Strengthened technical capacity in MFLR, MAFS, MNR, MLGC, DMA and NUL at national and district levels and community representatives on climate change adaptation and integrated watershed management

A number of capacity development initiatives were implemented focusing on integrated watershed management. However, these capacity development initiatives have not considered climate change related issues. There are significant gaps with respect to technical capacity related to livelihood diversification at the household level and sustainable land and water management (SLM/W). The project will enhance capacity through development of a coordination mechanism for ensuring collaboration, information exchange and effective policy implementation.

This will entail coordination across sectors, at sub-national level and between government and NGOs and CBOs; integration of climate change issues into relevant sector policies / strategies at national level, as well as project and development plans at district and local level using a gender-sensitive approach to planning; and promoting coordinated and harmonized research and education, and providing training on research grant proposal writing for personnel within MAFS research unit and NUL to improve access to finance for research.

Output 1.1.1: National level MFLR, MAFS, MNR, MLGC, DMA and National University of Lesotho (NUL) staff and district level forestry and natural resources staff trained on climate change adaptation, integrated watershed management and community mobilization

The first step in the technical capacity development at the national level will be to provide introductory training to the staff of MFLR, MAFS, MEWM and National University of Lesotho (NUL) on climate change adaptation with special focus on watershed management. This training will focus on selected 60 national level staff from the stakeholder organizations. The main activities will include capacity needs assessment, curriculum development, organizing training programme to the national level agencies in two phases.

The first training will be organized during the first year of the project and the second one during the third year of the project. There will be a training programme specifically focusing on research and development linkages on climate change adaptation to the national level research institutions on development of proposals.

The project will provide training to 90 staff within the three districts on community mobilization including enhancing consultation and involvement of users at grass-roots level to identify and contribute to action programmes in close collaboration with community councils. The district level trainings will focus on diversified livelihood strategies, land and water management and integrated watershed management. The staff will also be trained on establishing /reviving grazing associations, *holistic management* of rangelands, village water committees, village disaster management teams, agricultural commodity groups. Training will also be conducted on holding awareness and advocacy campaigns, leadership skills, gender mainstreaming, conflict management, diversified livelihood strategies and conservation Agriculture and Machobane Farming system.

The training programmes at national and district levels will be organized in close coordination with other LDCF projects especially IFAD-managed “Adaptation of Small-scale Agriculture Production (ASAP)”, UNDP Managed "Reducing vulnerability from climate change in the Foothills, Lowlands and the lower Senqu River Basin" and “Strengthening climate services in Lesotho for climate resilient development and adaptation to climate change (2nd phase of the LMS/GEF/UNEP LDCF NAPA Early Warning Project)”submitted by UNEP.

Lesotho decentralisation framework (2006) defines roles, responsibilities and procedures for planning budgets, resource allocation and project implementation. The project will build capacity of the District Planning Unit (DPU), the District Development Coordination Committee (DDCC), and the District Planning Office (DPO) in developing and prioritizing plans, as well as development of proposals. The project will provide training on: Planning and budgeting, including integrating climate change issues into plans, Project implementation, Monitoring and Evaluation, Leadership, Coordination and Conflict Management. Selection of participants for training programmes will follow the Government guidelines, especially in relation to gender. There will be a strong consideration to include at least 50% women participants in all training programmes.

Output 1.1.2: Training to the local representatives from community based organizations (CBOs) on good practice examples of sustainable land and water management, water harvesting, diversified livelihood strategies (at least 24 farmer groups (1200 farm households) in 3 livelihood zones will be trained).

At least 24 farmer groups from the three project sites will be trained on water harvesting, rehabilitation and maintenance of old ponds/ dams; conservation agriculture, Machobane Farming System, crops, agro-forestry, fruit and vegetable production, beekeeping, piggery and poultry production, wool and mohair production and marketing as well as range management.

The trainings will be augmented by field demonstrations of the technologies introduced. Field demonstrations will be conducted in 24 locations in the 3 project sites. The groups will also be trained on planning and budgeting, record keeping, financial management, basic farm management and operational systems, leadership, conflict management, and marketing. In the community level training programmes, women groups and women associations will be given preference.

The project will strengthen/ revive coordination of local institutions working on natural resource management at district and local level. The local government structures at district and community levels are not functional in all the three districts where the project will be implemented. The revival and training of these structures will ensure effective and sustainable land and water resources management.

Component 2: Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale

Outcome 2.1 Improved data, tools and methods for assessment of impact of climate change on land suitability and land use, vulnerability and risk at the national/district level implemented focusing on most vulnerable watersheds

The first activity under this component will focus on improvement of databases for most vulnerable livelihood zones. The proposed database in the Ministry of Forestry and Land Reclamation (MOFLR) will focus on crop, livestock and agro-forestry, land use and its suitability. In addition, a comprehensive risk and vulnerability assessment for current and future period will be conducted for 3 livelihood zones.

The Disaster Management Authority is given the mandate to conduct livelihood assessments in Lesotho. The Lesotho Vulnerability Assessment Committee (LVAC) was formed in 2002 as part of the regional effort to respond to the food security crisis that faced six SADC countries at the time. The LVAC is made up of several stakeholders including state and non-state actors. The Regional Vulnerability Assessment Committee (RVAC) under the Regional Vulnerability Assessments and Analyses Programme Management Unit (RVAA - PMU) of the SADC, the Directorate of Food and Natural Resources (FNR) assists governments to conduct vulnerability assessments to deal with the increasing demand for reliable and timely analysis of livelihood vulnerability. Since its establishment, the LVAC has been undertaking annual livelihood vulnerability assessments to inform decision making for interventions. At the initial stage LVAC focus was on emergency food needs assessments.

LVAC falls under the Disaster Management Authority (DMA) of the Prime Minister's Office and is mandated to provide information on vulnerable populations and provide recommendations to, for example the Ministry of Agriculture and Food Security, Ministry of Finance and Development Planning, the Ministry of Health and Social Welfare, international partners and local NGO's, on the appropriate responses. The aim of LVAC is to incorporate a deeper understanding of livelihoods in emergency and development programming and broaden early warning systems. After initial focus on emergency food needs, it became increasingly clear that responses to food crises need to go beyond short – term food aid needs to longer term livelihoods interventions. DMA is currently implementing the Lesotho Disaster Risk Reduction Early Warning Information System project which is funded by the World Bank and World Food Programme.

Output 2.1.1: Livelihood and land use (crop, livestock, agro-forestry) data base developed for most vulnerable watersheds (database will be established in Ministry of Forestry and Land Reclamation and linked to potential users at the national level) and relevant staff trained

The MAFS will collaborate with MFLR GIS Section to map the croplands and digitise data on ownership, size and demarcation of individual land, soil type, soil fertility and potential and actual yields, land capability classification for cropping suitability. The MFLR GIS Section will map vegetation type, and extent of land degradation. In addition, soil erosion study sites will be established for monitoring the rate of soil erosion, and organic matter for carbon sequestration. The data on livelihoods with gender disaggregation will be explicitly considered for building the data base. The LSPP is willing to map the land use patterns of the 3 selected project sites. This calls for the LSPP to work closely with MFLR GIS Sections. The work will be carried out through technical support from the centres of excellence at the regional level in Southern Africa through Letters of Agreement (LOA). An international expert will be employed for 10 weeks during the first year of the project to assess the current status of the data base, institutional issues and assist the national project coordinator to identify the suitable firm for development of LOA and execution of the work.

At least 50 core staff at MFLR, MAFS, MNR, Ministry of Local Government and NUL at the national level will be trained (out of which at least 20 will be women) on updated and use of the new data base on land use and its suitability under scenarios of climate change. Climate change risk analysis in Lesotho is still very new and poorly quantified. Furthermore, it is not made widely available for enabling transformation from the reactive climate change response to a more proactive response. The proposed project will build capacity of core staff in using climate change projections and retrieving data from GIS packages, analysis and interpretation of data, as well as translation of data into adaptation actions, ensuring that climate change information is sector-relevant. The project will enable staff to develop a communication strategy and build capacity of staff in effectively disseminating climatic information. Close coordination will be ensured with GEF LDCF project to be managed by IFAD and UNEP that have components and activities related to early warning systems and climate information services.

Output 2.1.2: Vulnerabilities and risks (current and future) assessed for the selected watersheds in 3 livelihood zones and spatial information on vulnerability available to facilitate adaptation planning by the Government and relevant staff trained

It was agreed that the DMA, MAFS, and LSPP will collaborate with the MFLR in conducting vulnerability assessments of the 3 selected project sites. At the district level MAFS, MFLR, DMA, MEMWA and MLGC (including women) will be trained on the use of spatial information production for decision making. The climate change projections available with the Lesotho Meteorological Services (LMS) will be used for vulnerability and risk assessment. The information products will be integrated with the national level database and delivered at the district level to decide on the adaptation practices. An international expert will be hired during the first year of the project to assess the data availability and design a comprehensive strategy for vulnerability and risk assessment. The international expert will be supported by a national expert who will assist to identify and compile the list of data sets available from different sources. Both the international and national expert will develop a strategy to implement the vulnerability and risk assessment and agree on the roles and responsibilities and will assist the NPC to select a firm to conduct the work. The vulnerability assessment will use gender disaggregated data to ensure weighted score to reflect the high level of vulnerability of women to climate variability and change.

The district level forestry, local government and natural resources staff (including women) will be trained on use of spatial information products for decision making. The project will train district level staff representing various ministries on the application of geo-information for scenario analysis to develop alternative planning strategies. The staff will be capacitated to identify and assess vulnerability and risks applying participatory spatial tools and techniques, determine the biophysical and socio-economic aspects of climate change and technology transfer to inform decision making and promote adaptive behaviour. The training programmes will be delivered by a technical center or a team of consultants to be identified during the project implementation. Introductory trainings will be carried out concurrently during the data collection and analysis phase of this output 2.2.1. In total 30

staff (10 staff from each district) will be trained in two phases during the project period. This should also include women participants.

Component 3: Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds

Outcome 3.1: Sustainable land and water management (SLM/W) practices (soil erosion control, soil and water conservation, water harvesting, run-off reduction, vegetative cover, range resource management) successfully adopted in selected 24 watershed and catchments.

The communal land tenure system of Lesotho is usually blamed for declining agricultural productivity in Lesotho. Individual pieces of land for crop production face serious threats from soil erosion, yet the fields are inherited from one generation to another. That means that lack of incentive to introduce acceptable standards for managing the land appropriately stems more from low level of dissemination of the know-how within the family. This is compounded by decline in the extension service and inadequate reach of improved technologies to the farming households. In addition, the low yields tend to lead to low income and affordability to apply good farming practices.

Historically, Lesotho is said to have been the granary of the southern part of Africa that exported grains to its neighbour. In 1932-33, there was an unprecedented drought which was especially damaging and forced many Basotho men to engage in migrant labour. Last 30 years, Lesotho has suffered from numerous droughts with the nation being especially hard hit during the first half of the 1980s, 2002-2004, and again in 2007. Summer rains in Lesotho are often violent; severity of these storms, coupled with heavy farming and the thin nature of Lesotho's soil, has resulted in massive erosion and donga formation. The government (under British rule) introduced soil erosion measures in as early as 1930s.¹⁶

Soil erosion control measures have been maintained to this day, while others fell by the wayside, consequences of which are the networks of gullies (dongas) that scar the Lesotho's landscape. Basotho gave different names to the conservation works in their fields, for instance, *makorota*, a derivative from an Afrikaans language (of the Boers in South Africa) of the neighbour, implying 'reduction in size of the land'. Researchers concluded that introduction of conservation measures brought more erosion problems than before and successive development projects did not achieve effective control over the years.¹⁷ Showers contend that the structural control measures introduced by the British government were responsible for much of the damage¹⁸.

The above statements indicate that the project must be very cautious in approaching sustainable land and water management practices (SLM/W) and implementation of conservation work on project sites. Participatory methods will be used in approaching the communities and selecting appropriate SLM/W practices and ensuring participation of vulnerable groups, including women. These will give comparative advantages to the application of the respective methods in relation to the long term sustainability for higher crop yields. The integrated watershed management expert envisaged for 12 months will assist the NPC to design the sustainable land and water management practices based on the local conditions.

¹⁶ Rosenberg S, and Weisfelder, R.F., 2013. Historical Dictionary of Lesotho, Second Edition. Scarecrow Press Inc., United Kingdom.

¹⁷ K. C. Nobe, D. W. Seckler. 1979. An economic and policy analysis of soil-water problems and conservation programs in the Kingdom of Lesotho. Maseru: Lesotho Agricultural Sector Analysis Project, 205pp. maps. (LASA Research Report No. 3).

¹⁸ Kate Barger Showers. 1982. Assessment of the land use potential of Ha Makhopo, Lesotho, southern Africa: a holistic approach to agricultural evaluation. Unpublished PhD thesis, Cornell University Graduate School, 312pp. maps.

The sustainable land and water management (SLM/W) practices including soil erosion control, soil and water conservation, water harvesting, run-off reduction, vegetative cover and range resources management practices as described above. The total beneficiaries include 1200 households and approximately 4800 individuals and total area covered will be 2400 hectares (100 hectares x 24 communities).

Output 3.1.1: Adaptive land use and sustainable land and water management (SLM/W) practices implemented in at least 24 communities in 3 livelihood zones (1200 households and 1200 hectares of arable land – approximately 1 hectare of arable land per household). The crops and cropping systems will be selected based on the detailed land suitability analysis to be conducted under component 2.

Current activities in the Ministry of Forestry and Land Reclamation (MFLR) are geared towards rehabilitating and reclaiming land, by implementing structural and biological measures. The practices include diversion furrows, silt traps, stone lines, terrace farming, contour farming, and protection of wetlands.

The diversion furrows are channels with a supporting ridge on the lower side constructed across the slope. The diversion furrows will be constructed above croplands to channel water to safe waterways hence protecting the fields from erosion due to excessive runoff. The purpose of a diversion furrow is to divert water from areas where it is in excess, to sites where it can be used or disposed of safely. Conditions where diversion furrow applies are areas where runoff from higher lying areas is damaging cropland, rangeland, farmsteads, or conservation practices such as terraces or strip-cropping.

The silt trap structures will be constructed by using gabions, loose rocks or any material that can trap soil during runoff or during heavy rainfall. These practices will be constructed as head structures or across the gully to trap the soil. The purpose of silt traps is to trap soil in gullies, so that vegetation can grow on the soil and hence stabilise the gully. However, implementation of silt traps depends on the local conditions. At the head of the gully where the gully is actively expanding due to conditions such as heavy rainfalls or soil qualities; and across the gully where the structure will be able to trap the soil from up the gully.

Similarly, stone lines will be considered to protect the rangelands or slopping areas and croplands in a micro-catchment by reducing the runoff speed that is a major cause of erosion. The stone lines also trap soil so that vegetation can grow and the stone line structures will be constructed with loose rocks on a slope along a contour. They are made on slopes where removal of vegetation cover, mainly by grazing animals, has left the most of the soil exposed. Similarly, terrace farming uses the topography of the land to slow water flow through a series of terraces that can prevent from gathering water flow speed and washing soil away from croplands. Contour farming replicates the effects of terrace farming, but on a smaller scale. Rather than planting crops in straight vertical rows, crops are planted following the contour of the landscape. Crops planted up and down hillsides create pathways for water to flow. Crops planted parallel to the land slow the flow of water that prevents soil erosion.

Wetlands that currently yield water for livestock and livelihood of the communities are under threat from over-utilisation by livestock. During dry periods, ice rats contribute to their destruction as a result foraging on the peaty (organic) soils, digging holes that get easily eroded during heavy rains. Protection of wetlands includes promotion of activities (re-vegetation, grazing management plans, and erosion control structures) that will enhance their functional ability: improved water quality, constant supply of water, control of floods, biological diversity conservation and carbon sequestration.

Building on the previous experiences in Lesotho notably on FAO TCP on Strengthening Capacity for Climate Change Adaptation, the project will introduce Conservation Agriculture (CA) in the selected communities as one of the options for sustainable land and water management. CA is a technology that will address a number of production challenges (e.g. scarcity of water, erosion, loss of soil

fertility). According to the strategy to upscale CA in Lesotho it is envisaged that by 2030 conservation agriculture will be a dominant farming system practiced by the majority of farmers in Lesotho, leading to increased and sustainable agricultural production, farm profitability and sustainable land management¹⁹. CA practice ideally prescribes adoption of three main principles: minimum soil disturbance, maximum soil cover, crop rotation and/or intercropping.

Currently the most prevalent CA technique practised in Lesotho is in the form of basins (*likoti*). Alongside the *Likoti*, mechanized operations also evolved over time with the use of animal and /or tractor drawn no-till planters. These no-till planters cut a narrow slot into the soil, place fertilizer and seeds into it and cover the slot again. The planting is done with minimal disturbance to the soil and can be carried out through mulch or crop residues as when using a jab-planter. Use of residual and /or crop cover and practice crop rotation are also recommended. Training on CA should be provided by recognized and established experts.

Early maturing, short season and drought tolerant varieties of maize, sorghum, wheat and beans are encouraged in the Southern Lowlands and Senqu River Valley while in the Mountains maize, wheat and pea varieties are encouraged. Winter legumes (pea) and summer legumes (bean) inter-planted into the main cereal crop can also be introduced in the southern Lowlands. It should be noted that Open Pollinated Variety (OPVs) seeds should be used as they can be used in subsequent season unlike hybrid seeds which have to be purchased every season.

The project will assess the feasibility of introducing the Machobane Farming System (MFS) which was developed in Lesotho by James Machobane in the 1950s. The MFS is an intensive, sustainable, low external input cropping system. Inter-planting and relay planting will be practiced where ever possible to make intensive use of the land, ensure harvest throughout the year and spread risk. A detailed list of integrated watershed management practices that contributes to adaptive land use and sustainable land and water management are provided in Annex V.

Output 3.1.2: Improved water harvesting structures at the household level implemented in 3 livelihood zones (At least 150 households possess water harvesting structures, which will also include women headed households)

The average rainfall of Lesotho is 788 mm and in general winters are dry and most of the rainfall occurs during the spring and summer, with 85 percent of the annual rainfall usually falling between October and April. Although, October is considered the start of the rainy season, which coincides with the planting season, agriculture has become precarious, as the rains often do not arrive until December and January, which is often too late for farmers to plant their crops. Similarly, early start of the rainfall followed by dry spells often reduces the yield drastically.

Small-scale water harvesting and storage facilities need to be promoted to reduce the crop yield variability and management of the dry spells. At the same time the small scale water harvesting structures would consider the preference by rural women and suitability for women headed households. Harvesting of rain water during early season wet spells (Nov – Dec) can compensate the late season water deficit (Jan – Mar). Construction of water tanks (stone built with cement), dams and ponds, in order to collect and store rainwater are often recommended. This makes the water available for livestock and crop production, through conventional but most preferably drip irrigation, during times of scarcity and drought. The water tanks are often preferred to be constructed close the house so that the roof water can also be effectively stored for both household use and also for irrigating crops.

Use of a ram pump that applies kinetic energy to drive itself and pump water up to head of 20 metres is the most ideal to transport water from the small ponds. It does not need any external source of energy such as electricity and solar that usually comes with heavy unsustainable running costs. The

¹⁹ Marake, M.V. Conservation Agriculture in Lesotho: Up-scaling Strategy Framework 2013-2017, Food and Agriculture Organization, 2013

pump was designed and tested by the Department of Agricultural Research (DAR), MAFS, though the assembly was done in South Africa. The output 3.1.2 will consider this practice based on the requirement and suitability at the local level.

Output 3.1.3: Improved vegetative cover and range resource management measures adopted in 24 communities to improve productive use of marginal lands (This will cover 600 households and 2400 individuals and cover a total area of 1200 hectares (approximately 50 hectares per community)).

Improvement of vegetative cover and range resources management measures include formation, strengthening and legal empowerment of grazing associations through community mobilisation. An integrated approach (considering the gender-sensitive approach to planning) will be designed during the first year of the project. National expert on rangeland management will work for 6 months during the first year and 6 months during the second year of the project to provide technical support for implementation of the activities related to the output 3.1.3 and will be supported by the livelihoods development and gender expert.

Procedure in Formation of Grazing Associations/Resource User Groups

Types of user groups can vary from one area to another, but in general owners of livestock make the largest and most active groups of natural resource users. In this respect, these are the grazing resources. Others are fuel wood users, herbalists and handcrafters, etc. The procedure is as follows:

Step 1: Sensitisation of communities.

Step 2: Identification of community interests.

Step 3: Election of village representatives (management committee).

Step 4: Formulation of user group constitution. Outline of the Constitution:

- (a). Preamble; (b). Objects; (c). Membership; (d). Finances; (e). Members' benefits; (f). Administration; (g). Election of office bearers; (h). Termination of membership; (i). Dispute resolution/conflict management; (j). Meetings of the Association; (k). Amendments to the Constitution; (l). Bye-laws; (m). Dissolution.

Step 5: Election of executive committee for user groups.

Step 6: Empower user groups through, a. Training on management skills for the executive and representatives, b. Training on technical skills; c. Study tours.

Step 7: Identify user group management constraints.

Step 8: Follow-up on groups to engage in formation of constitutions and registration.

Step 9: Develop management plans and enforcement.

Step 10: Monitoring.

Range inventory and monitoring²⁰ - Baseline assessments of rangeland condition and determination of carrying capacities will be made at the beginning in the first year, ensuring the active participation of women. Using a GPS to determine and record coordinates, permanent transects for monitoring changes in vegetation will be established. Annual assessment of vegetative condition and likely management and climatic impacts will be carried out.

Grazing management plans will be developed jointly by the technical staff of the Department of Range Resources Management of MFLR and the project beneficiaries involved in the management of range and livestock, ensuring active participation of women in both groups, the technical staff of MFLR, as well as of project beneficiaries. Data generated from range inventory will be used in development of the plans. Livestock population figures will be derived from collaboration with Councillors, Chiefs and owners of livestock, as well as from livestock registration (for tattooing and branding) of the Ministry of Home Affairs. Application of holistic management will be piloted and put into use, as this has proven to be a possible solution for reversing overgrazing.

²⁰ Detailed methodology is in the "Range Operations Manual" of the Department of Range Resources Management, Ministry of Forestry and Land Reclamation.

Component 4: Strengthening diversified livelihood strategies and implementation of improved income generating activities at the community level

Outcome 4.1: Diversified livelihood strategies and small scale and household level income generating activities successfully demonstrated and adopted by target 24 communities, including women headed households. This will directly benefit 750 households (3000 individuals). The total area to be covered under this investment will be approximately 375 hectares (approximately 0.5 hectare/household).

During the formulation phase, the project communities reported that poverty is the single most important reason for the current lack of adaptation; farmers require assistance to access improved seed suited to the climatic conditions, farming implements and other inputs, in particular women, who usually face more difficult conditions related to access to inputs. Most people living in the project sites practice subsistence agriculture and it is anticipated that they will continue producing rain-fed field crops. However, yields from rain-fed agriculture are low and as a result most households are food insecure. Crop production in Lesotho depends largely on traditional, low input, low output, rain-fed cereal production. The productivity of both crop and livestock production is low and has declined due to land degradation and poor husbandry. For instance grain yields have fallen from 1.4 t/ha in the 1970s to 0.4-0.5 t/ha in recent years, compared with 4.0 t/ha in the neighbouring South Africa with similar climatic environment.

The country's limited production potential is not fully exploited due to poor farming practices, limited use of quality seeds, inappropriate crop selection and lack of diversification. The country experiences recurrent cycles of drought, erratic rainfall, hail and frost. The consequence of this variability includes drastic crop failures, poor harvests and loss of livestock which exacerbate vulnerabilities, such as food insecurity and sustainable livelihoods. Heavy snowfall, strong winds and floods also pose considerable risks to the subsistence livelihoods of the Basotho people. Under climate change conditions, Lesotho is predicted to experience warmer climate with uneven patterns of precipitation. According to climate change scenarios, the frequency and intensity of floods, droughts and storms are expected to increase. Soils are mostly poor and levels of land degradation are high. The diversification of farming and the local economy was regarded as an important adaptation in all three sites during the pilot phase of the project.

Output 4.1.1: Community participation ensured in 24 community groups in selected watersheds of 3 livelihood zones and introductory sessions conducted and small-scale household level income generating and food and nutrition activities (e.g. horticulture, small ruminants, beekeeping) introduced to 750 households.

Keyhole and trench gardens: This is one of good practices and local adapted technology acknowledged as gender-sensitive and promoted by local NGOs and previous FAO project on adaptation. It will specifically target women headed farm families and those especially affected HIV/AIDS that has serious labour shortage. The project will also introduce keyhole and trench gardens (double dug) which are fast growing adaptation strategy to climate change in Lesotho. The two systems of home gardens have been promoted by local NGOs. Keyhole and trench gardens have proven an effective way to grow vegetables year round in semi-arid climate because they nourish the soil and help it retain moisture. These gardens reduce the labour required to produce food for the household which helps households affected by chronic illnesses and HIV/AIDS, and households headed by women or the elderly with limited labour capacity. Keyhole gardens and trench are easy to construct and advocate for use of locally available materials/ resources which include, among others; wood ash, manure, and aloe. The crops to be recommended for the keyhole gardens will ensure proper nutrient supply to the women, children and elderly. Domestic and grey water can be used to water these gardens. Home gardens can be complemented with roof water harvesting tanks (Output 3.1.2).

The benefits of keyhole and trench gardens include soil enrichment, moisture retention in arid or semi-arid climate, labour saving, reducing dependence on external inputs and year-round vegetable

production. Beneficiaries in this activity will provide stones, sand, and labour for the construction of the roof tanks while MFLR provides cement and technical supervision.

Homestead gardens: Lesotho's climate and elevation are suited to many temperate fruits and nuts and the cold winters reduce pests and increase the opportunity for organic production at the household level. Almost every rural household has one or more peach tree, some self-sown. Some households also have orchards or a few planted trees including apples, plums, apricots, grape vines, mulberries and prickly pears. Most households have one or more peach trees and plant a small home garden area, especially those who have access to water. For instance, 86% of all rural households had one tree, 66% of which were fruit trees²¹.

Most of these were planted in around the homestead. The fruits produced can be eaten fresh or dried. The prevalent fruit trees include peaches (*Prunus persica*), apples (*Pyrus malus*), apricots, (*Prunus armeniaca*), pears (*Pyrus communis*) and quinces. All of these grow very well in all the bioclimatic regions of the country and provide important nutrition to some of the poorer members of both the rural and urban communities. Fruit tree production can be combined with apiculture (bee keeping) and it would provide employment opportunities to rural women especially women headed households. Fruit tree production can also be combined with trainings on food preservation in the form of canning and drying. Thus fruit tree production combined with apiculture will be introduced in the target communities.

Development of water harvesting structure under output 3.1.2 can be linked with the development of horticulture. Water harvesting is relatively easy and inexpensive, and the topography of most of the country is ideal for gravity-fed irrigation and small hill-top reservoirs. Drip irrigation utilizing hill-top reservoirs and small dams (ponds), will be introduced in the project areas.

Small ruminants and poultry production: Livestock farming is important in Lesotho. The Lesotho's livestock sector consists of cattle, sheep, goats, horses, donkeys, pigs, and poultry. Livestock are kept for both economic and social reasons. Cattle are raised for mostly subsistence use including draught power, milk, fuel (dung), and meat. Cattle are also kept for socio-cultural uses such as *bohali* (bridewealth) and ceremonies. The sheep are of the merino type and are raised for the sale of their wool, slaughter as well as for ceremonial purposes. The goats are of the Angora type and are raised for the sale of mohair and ceremonial purposes. Horses and donkeys mostly serve transportation functions in the remote rugged interior of the country. Donkeys are used for transporting goods while horses are used for human transportation.

Livestock productivity is low in terms of off-take and animal fibre principally due to poor animal health and husbandry, low conception rates, weak lambing/kidding, weaning, and retarded growth. Low wool and mohair production are directly related to poor nutrition, infertility of breeding stock, and inadequate husbandry. Stock theft is widespread and has affected most households especially in areas adjacent to the border with South Africa. Rangelands are either under-or over-grazed. In remote areas, rangelands are under-grazed due to remoteness, stocking rates and the traditional patterns of winter spelling and rotational grazing. On the other hand, village pasture areas around settlements support high stocking rates and are severely degraded. Livestock are reared around homesteads for half the year due to the onset of winter, shearing, dipping or to minimize the risk of theft.

Short-cycle (intensive) animals which include pigs, chickens, and rabbits have been promoted to fight food insecurity and as sources of income. The advantages of short cycle animals are that they do not need range resources and can easily be managed by women and elders. Dual purpose chicks (Potchefstroom Koekoek) are the promoted type of chickens as they are hardy, produce eggs and meat. The project will distribute dual purpose chickens following the practice of the 'Neheletse system. 'Neheletse is a dynamic process of social and economic relationships that entails receiving a commodity, multiplying the commodity and retaining part of the output (production) of that

²¹Sechaba Consultants, Gardening Trends in Lesotho. Livelihoods Recovery through Agriculture Programme Discussion Paper 6. 2004

commodity and passing part of the output (production) of that commodity in the same form and quantity received²².

For instance, fertile hatching eggs in the case of poultry and small ruminants can be distributed to the more vulnerable households in the community, based on distribution criteria also agreed by the community. In turn, the beneficiaries are expected to also pass on fertilised eggs to other households identified by the community. The number of households acquiring animals is therefore expected to increase over time thus increasing the livestock asset base and enhancing food security at household level. If one of the initial stock dies or is stolen, the responsible farmer shall immediately report to the committee and if it is established that the cause of death or theft has been due to negligence, the farmer shall pay based on the cost of the damage at that time. The dual purpose chickens will be sourced from farmer groups who are producing the chickens through assistance of the IFAD funded Smallholder Agriculture Development Project.

Promoting Village Savings and Loans Associations (VSLAs): Promotion of VSLAs will aim to improve household level income generating activities described under the output 4.1.1. This activity will target women headed families to ensure financial resources for household level investments. VSLAs are based on the belief that for the extremely poor, particularly women, the right approach is to begin by building their financial assets and skills through savings, rather than debt²³. By having access to savings services and small loans, members can smooth irregular income patterns and meet basic household consumption needs rather than taking on significant debt they may be unable to repay. And when they do borrow from the VSLA, loan sizes are generally small and manageable.

At the end of every VSLAs' annual cycle, all outstanding loans are recovered and the loan fund is shared out. The loan fund (which includes lending profits) is divided by the total number of savings shares purchased by members during the cycle, to calculate a per-share value. Each member then receives his or her share according to the number of shares purchased by that member. Through participation in a VSLA members can diversify their activities, plant additional crops and even add new income generating activities.

Savings and Credit Clubs have been promoted in the country by NGOs (e.g. CARE Lesotho, and World Vision, Lesotho). Burial societies are the most prevalent community organizations in the country but the problems of burial societies are that members only enjoy benefits when their relative is late. The difference between burial Societies and VSLAs is that VSLAs have introduced the concept of savings and investment whereby members earn dividends every year depending on how much they have invested in the club. Local NGOs already engaged in VSLAs will be sourced to provide trainings. It is envisaged that 7 VSLAs will be established in the 3 project sites.

In order for farmers to make appropriate decisions on what and when to plant they need to be advised and capacitated. 100 farmer groups in the 3 project sites will be trained on all the technologies to be introduced which include CA, Machobane Farming System, home gardens, fruit tree production, beekeeping, dual purpose chickens, agroforestry and Village Savings and Loans Associations. The trainings will be augmented by field demonstrations of the technologies introduced.

Output 4.1.2 Field demonstration of locally relevant multi-purpose agro-forestry to protect and improve livelihood systems conducted in 24 locations and adopted by the stakeholders covering 375 hectares.

Windbreaks for protecting livelihood assets and as a source of fuel wood: The Lowlands areas are prone to strong winds which often cause considerable damage to local communities. Forest trees can be planted as windbreaks and for fuel. In the lowlands, where storm winds wreak havoc, the most

²²Tshabalala, M. Comprehensive Guidelines on 'Neheletse Final Report. Ministry of Agriculture and Food Security. 2006

²³ Hendricks, L. Village Savings and Loans: A Pathway to Financial Inclusion to Africa's Poorest Households. CARE, 2011

important adaptation is the planting of trees, windbreaks and hedges to protect both crops and homes. In the mountains, shelter for livestock and improved early warning systems were given high priority.

The LDCF project will focus on Agro-forestry in smallholder rural areas that protect their resources and provide additional benefits. The trees serve as a source of fuelwood (dead branches) and provide shelter, fodder for livestock and food. These agro-forestry systems can serve as windbreaks and also serve as a source of fuelwood, timber and in some cases, veneer wood. Sometimes the orchards are under-planted to pasture in order to include a livestock enterprise. There are additional benefits for the local communities from beekeeping component within the orchard. The LDCF will support farmers to grow fodder tree and shrub species for livestock. These trees also provide other benefits such as fuelwood and poles that can contribute additional household income. The intervention includes development of a replication strategy to ensure wider adoption of practices involving district level staff.

Multi-purpose agro-forestry systems (fodder trees): Multi-purpose agro-forestry systems are suitable for generating additional income for the households. Agroforestry in the form of planting fodder grasses, fodder trees and fodder sorghum will be introduced to relieve the overstocked rangelands. The fodder trees that will be introduced include tree lucerne or tagasaste (*Chamaecytisus palmensis*), *Telinemons pessulana*, saltbush (*Atriplex nummularia*, *A. lentiformis*), *Colutea arborescens* and tree lupin (*Lupinus arboreus*). These trees could be planted in rows intercropped with herbaceous annual or perennial fodder crops such as bana grass, elephant grass, lucerne, clover, rye grass, vetches (*Vicia* spp.), triticale, barley, oats and fodder sorghum.

Hedges and live fences: problems of trespassing are much higher in the lowlands than the mountains, but in both regions it is advisable to establish protective hedges and live fences around the homesteads, especially against livestock kept within the village but also trespassing humans. A number of species are suitable for live fencing, including *Agave americana*, which can also be used for fencing in livestock near the homestead. *Agave* has the added benefit in that it is used in the production of medicinal products, and its large inflorescence is eaten by livestock.

Component 5. Dissemination of best practices, project monitoring and evaluation

Outcome 5.1: Stakeholders and communities aware of improved SLM/W practices, livelihood diversification and household level income generation practices through wide dissemination

Output 5.1.1 A communication strategy established in close collaboration with the MOFLR, MAFS, MNR, Ministry of Local Government and Cheiftainship (MLGC) and NUL and implemented

Development and implementation of a communication strategy: Currently the relevant stakeholder ministries have various ways of communicating with communities. However, most communities are not reached by these communications materials. A communication strategy will be established in close collaboration with the Ministry of Forestry and Land Reclamation, Ministry of Agriculture and Food Security, Ministry of Energy, Meteorology and Water Affairs, Ministry of Local Government and The National University of Lesotho. Communication materials will be developed and disseminated through existing activities of the focal ministries to ensure sustainability.

Improved diversified livelihood strategies and household level income generating practices as well as improved integrated watershed management practices will be widely disseminated at the community level. This will be disseminated through extension services, field demonstration projects and study tours as well as print media, radio, television and farmers' field days. The project will also utilise individual farmers who achieve better results than their neighbours. The project will identify the practices and knowledge that make these farmers more successful and teach them to others in the area.

Case studies and lessons learned: Lessons learned will be identified involving stakeholders. They will then be assessed and documented. The lessons learned will be shared through field days

associated with demonstrations of best practices in the three project sites, with beneficiaries from all the sites visiting to learn from each other. This will be followed by dissemination of information on lessons learned through print and electronic media. Special focus will be given to package gender sensitive adaptation practices and in particular how they will impact on women headed households.

Dissemination and sharing of data: Dissemination of land use data will be ensured through customized database to be developed in Ministry of Forestry and Land Reclamation (MFLR). The vulnerability and risk information products will be hosted and disseminated through the Disaster Management Authority (DMA).

Outcome 5.2 Project implementation based on results based management and dissemination of best practices and lessons learned for future operations

At the commencement, the project must ensure that field activities are started as early as possible in order to allow time for assimilating, gathering, recording and disseminating beneficiaries' testimonies on their experiences and best practices. Projects tend to get bogged down on prolonged administrative matters during the settling-in phase, quite often oblivious to the need to get into action with speed.

The MFLR will launch a regular newsletter through which project activities will be disseminated. It will be supplemented by other print media (posters, brochures, pamphlets, fliers, etc.). This will complement the on-going television and radio programmes that are broadcast by the government media houses. The project will support development of effective facilities for internet technology, at least in the districts of Thaba Tseka, Mafeteng and Quthing, where project sites are located, so that storage/retrieval of data and project information are well founded and communicated widely.

Output 5.2.1: Systematic collection of field based data to monitor project outcome indicators at all levels and evaluations.

One of the criteria for selecting the project site was that it should be 'an area with no similar previous projects' so as to avoid communities that may be suffering from project fatigue, and so coupling that with a fair spatial distribution of development assistance. This being the case, then it means that there is a high likelihood that there will be no baseline data. Lesotho suffers from insufficient data in most spheres of development. All field data will, therefore, be collected in the first year. The available baseline data for three livelihood zones are provided in annex 1 and will be strengthened during the initial stages of project implementation. Additional baseline data will be collected during the first six months of the project and the base line data will focus on gender disaggregated indicators.

Two independent project evaluations will be conducted at project mid-term (after 2 years of project implementation) and at project completion. More details are provided in section 4.5.4.

2.5 ADAPTATION BENEFITS

These include: (i) comprehensive risk and vulnerability information available and institutions have capacities to integrate climate change adaptation into planning, programmes and activities (at least 170 staff from key institutions trained); (ii) target communities are aware of adverse impacts of climate change, and at least 1200 farm households have been trained on and are adopting climate resilient SLMW practices and livelihood strategies; (iii) increased food production in target communities. Precise indicators and targets are defined in the results matrix and the same has been incorporated into the AMAT tool.

2.6 COST EFFECTIVENESS

Arrangements for implementation are based on existing institutional structures at national and local levels. This has been done to improve cost effectiveness and also enhance project ownership. A

significant amount of Government staff will support implementation as part of Government co-financing. The Project has minimized international experts. This will reduce the costs associated with travel and consultancy fees. At the local level, the Project will rely extensively on community councils. The cost associated with mobilizing international experts is only USD 60 000.

2.7 INNOVATIVENESS

Holistic Management of rangelands is a decision-making framework which results in ecologically regenerative, economically viable and socially sound management of the world's grasslands. Holistic Management was first developed over 40 years ago by Allan Savory, a Zimbabwean biologist, game ranger, politician, farmer, and rancher, who was searching for ways to save the beautiful savannah and its wildlife in southern Africa. Holistic Management teaches people about relationship between large herds of wild herbivores and the grasslands and then helps people develop strategies for managing herds of domestic livestock to mimic those wild herds to heal the land.

It is based on four key principles that highlight the symbiotic relationship between herds of grazing animals, their predators and the grasslands. It embraces and honours the complexity of nature, and uses nature's models to bring practical approaches to land management, and restoration. The planning procedure embedded in the Holistic Management approach is designed to incorporate this complexity and work with it. It does take time, skills and discipline to use this decision-making framework successfully – but the economic, environmental and social benefits are enormous. Using Holistic Management practices, governments and development agencies can design and analyse policies and programmes using the holistic framework, so that they address the root cause of the problems they are trying to solve or prevent.

The holistic management decision making framework uses six key steps to guide the management of resources:

- Define what you are managing – by defining the whole, people are better able to manage it. The key is to get the right people to the table and identify the available resources, including money.
- Define what you want now and in the future – define a holistic context for future objectives, goals and actions. There are three components in a “holistic context” – the quality of life sought, what needs to be produced to live such lives and what their life-supporting environment must be like to sustain such lives far into the future.
- Watch out for bare ground – the earliest indicator of ecosystem health is soil cover. If the land is bare and there are few other signs of life, it's a poorly functioning environment. Bare ground can have deep impacts for people in both urban and rural environments such as increased flooding and decreased food production.
- Play with a full deck – there are eight tools for managing natural resources: money/labour, human creativity, grazing, animal impact, fire, rest, living organisms and technology. Grazing and animal impact have been added to the traditional land management toolbox to be used proactively as effective tools to restore ecosystem health.
- Test your decisions – there are seven questions that can help you test decisions to ensure they are socially, environmentally and financially sound for both the short and long term.
- Monitor proactively – At any time, assume your plan is wrong and use a feedback loop that includes monitoring for the earliest signs of failure, adjusting and re-planning.

SECTION 3 – FEASIBILITY

The project is closely linked to a number of policies and programmes of the Government of Lesotho. This provides opportunities to scale-up the project initiatives by the Government and other partners. Support to bottom up community participatory approaches are incorporated into the project design especially at the local level. Applying participatory approaches for decision making and implementation, and capacity development, will enable the poor and most vulnerable to engage in and benefit from local investments and take ownership of the interventions. There are opportunities to engage civil society and private sector and thus continuous support at local level is ensured and this will sustain the efforts. The efforts at the local level will be complemented by capacity development activities with the Government institutions at the national and district levels to provide continuous support services to promote local actions aimed at reducing vulnerability and interventions on sustainable land and water management.

3.1 ENVIRONMENTAL IMPACT ASSESSMENT

The project is designed to have positive benefits to the environment. No adverse environmental or social impacts are likely to compromise the project and it conforms to FAO’s pre-approved list of projects excluded from a detailed environmental assessment.

The project is classified as Category C under FAO’s guideline “Environmental Impact Assessment – Guidelines for FAO’s field projects”.

3.2 RISK MANAGEMENT

Risk and mitigation measures

Risks anticipated during project implementation and critical mitigation actions have been considered to facilitate effective planning and reduce any adverse impact on the performance of the project. In this project, there are four major potential risks identified. These are outlined in the matrix below:

Table 2. Expected risks, likely impacts and mitigation measures

Risk	Impact	Probability	Mitigation
Institutional conflicts over ownership of the project	Slow-down of project implementation and jeopardize integration of relevant	L	The project formulation process has secured the understanding and commitment to establish a Steering Committee of key relevant line Ministries (i.e. MFLR and MAFS and local government), Meteorological Services, Disaster Management Authority at both national and district levels in

	experiences into national programmes		order to ensure effective coordination and participatory decision-making.
Highly fragile environment for intensifying crop and livestock production	High-risk aversion to innovations among subsistence farmers and herders and high vulnerability to climate-related hazard	M	Building resilience of local ecosystem and ensuring stability in yields with little or no expansion on cropland or rangeland and optimal use of chemicals and fertilizer. Reducing vulnerability through reliance on improved farming practices, improved natural resources management including erosion control, micro-scale water control, pasture and fodder management, agroforestry and diversification of livelihood options.
Conflicts in the management of communally owned resources	Could lead to low interest in participation and failure of communally implemented innovations/practice.	M	Participatory approach in decision-making and building community consensus at the initial stage including some training on conflict management of common resources.
Sustainability/institutionalization of technical assistance related to data base development and management and capacity development activities	Inefficient utilization of the resources and non-use of database and technical expertise for implementation of adaptation practices	L	The concerned ministries and institutions were consulted and a thorough assessment was done to identify the host institution for data collection and management especially related to the land use and vulnerability and risk assessment. The capacity development activities under component 1 and 2 are designed based on the needs assessment and participants will be identified in close consultation with the respective ministries. The training resources will be integrated into the regular training activities.

SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS

4.1 INSTITUTIONAL ARRANGEMENTS

A. General institutional context and responsibilities

The integrated watershed management in Lesotho is a complex issue which presents diverse challenges. Therefore, effective climate change adaptation requires a multi-stakeholder approach. Thus, a stakeholder engagement plan will be prepared within 3 months after start of the project to ensure participation of all relevant government agencies and direct beneficiaries including women, farmers and livestock herders. During the project preparation phase, local representatives were consulted to identify women headed households especially for household level livelihood diversification activities. Representatives of women groups and village council representatives participated in the final workshop. Baseline data collection during the first six months of the project will quantify the exact number of women beneficiaries.

Under the project, the Ministry of Forestry and Land Reclamation (MFLR) will be the National Focal Point in facilitating the implementation of the Project, and will work closely with the Ministry of Agriculture and Food Security (MAFS), Ministry of Energy Meteorology, Water Affairs (MEMWA); Department of Environment (DOE), the Disaster Management Authority (DMA) and the National University of Lesotho (NUL). The National Project Steering Committee (NPSC) will be constituted with representatives from implementing partners, FAO and other development partners such as UNDP and IFAD. The Steering Committee will be chaired by the Principal Secretary of MFLR. The NPSC will be responsible for reviewing overall progress of the project and provide guidance and decisions to overcome constraints during implementation. The stakeholder mapping is presented below.

Table 3. Key stakeholders and their roles and responsibilities

Institution	Expectation / Relevance
Ministry of Forestry and Land Reclamation (MFLR)	<ul style="list-style-type: none"> • National Focal Point in facilitating the implementation of the Project • Capacity building, protection and rehabilitation of the physical environment through forestry, management of rangeland resources, control of soil erosion, and water harvesting • Small dam planning, design and construction
Ministry of Agriculture and Food Security (MAFS),	<ul style="list-style-type: none"> • Knowledge management on crop, livestock, and irrigation planning and design, • Support on agricultural research, information and extension services / community mobilization including LENAFU • Capacity building on GIS, crop modelling and vulnerability mapping
Ministry of Energy Meteorology, Water	<ul style="list-style-type: none"> • Provide information on climate trends and predictions to support planning and implementation of response to impact of climate change

Affairs (MEMWA);	<ul style="list-style-type: none"> • Capacity building on GIS, modelling and vulnerability mapping • Capacity building on climate change adaptation • Supply water to rural communities
Ministry of Local Government and Chieftainship (MLGC)	<ul style="list-style-type: none"> • Support and strengthening decentralized planning and implementation of sustainable land and natural resource management and administration • Protection of grazing land and agro- forestry initiatives • Integration of climate change issues into district development plans • Capacity building of district and community councils
Department of Environment (DOE)	<ul style="list-style-type: none"> • Knowledge management and awareness raising on environmental issues • Capacity building on environmental policy
Disaster Management Authority (DMA)	<ul style="list-style-type: none"> • Conduct vulnerability assessment and crop forecast to assess vulnerable areas/ food insecurity • Management of early warning system and response to potential disaster situations resulting from climate change • Coordinate and mainstreams disaster risk reduction actions, through Disaster Management Teams • Capacity building in vulnerability mapping and development of disaster management plans
National University of Lesotho (NUL)	<ul style="list-style-type: none"> • Conduct climate change-related research • Capacity building on agriculture, climatology, hydrology, water resources analysis, management and conservation of soils and range resources
Food and Agricultural organization (FAO),	<ul style="list-style-type: none"> • Provide Project oversight to ensure compliance to GEF policies and guidelines • Provide financial and narrative reports to GEF • Provide technical support on climate change related issues, including conservation agriculture, by drawing upon its capacity at the global, regional and national levels • Ensure that the Project efficiently and effectively meets its objectives and achieves expected outcomes and outputs as outlined in the Project document
United Nations Development Programme (UNDP)	<ul style="list-style-type: none"> • Share lessons and best practices from relevant UNDP-supported activities and projects in Lesotho • Member of project Steering Committee
International Fund for Agricultural Development (IFAD)	<ul style="list-style-type: none"> • Key partner through small holder agricultural development programme in support of commercialization of agriculture and diversified livelihoods • Capacity building in market-oriented production • Share lessons and best practices from relevant IFAD-supported programmes.
Natural resource users, grazing associations and resource user groups (Direct beneficiaries)	<ul style="list-style-type: none"> • Extensive indigenous technical knowledge and familiarity with concepts of group action, committee operations etc. • Commitment to SLM/W because of livelihood interests in a sustainable environment • Strong potential interest in achieving SLM/W and different resource users may have different SLM/W priorities • Gender differences may arise in SLM/W decision making • Political and other factional differences may hinder consensus and decision making in some local contexts • Leading agents of SLM/W through user groups or associations
Community Councils	<ul style="list-style-type: none"> • Legal authority for SLM/W, but little capacity to exert this authority at field level • Committed to fulfilling their NRM responsibilities, but currently uncertain how to go about this • Still exploring all aspects of their new role as local authorities • Likely to embrace user group concept as a way of fulfilling their legal responsibilities • Decision making could be hindered by (party) politics or other internal differences • Locus of legal authority for SLM/W and supervise government field staff who, under the newly decentralized system, are administratively answerable to Community Councils • Supervise and guide resource user groups acting on their behalf and provide

	modest levels of resourcing to these groups for their daily operations
NGOs	<ul style="list-style-type: none"> • Strong technical and institutional expertise in SLM/W and related fields • Detailed understanding of local development needs, opportunities, constraints • Currently engaged in various SLM/W-related activities, notably on-farm • Long standing interest in the environmental and SLM/W sectors • Members of project Steering Committee • Potential collaborator in SLM/W model development, training and knowledge management/ networking activities
Informal organizations especially women groups/Women associations	<ul style="list-style-type: none"> • Represent and ensure that women participate and benefit from the project. women representatives

All relevant stakeholders at national and district level were consulted during the project design stage. These stakeholders included government ministries, non-government organizations, farmer organisations and development partners. Stakeholder ministries were briefed and made commitments to achieve the project objectives through collaboration. All relevant stakeholders were appraised about the project during the inception and project preparation completion workshops. In order for sustainable implementation of the project at community level, community meetings were held in the project sites and the project introduced to them. Community members had inputs into what livelihoods, and integrated water management strategies they wished to be introduced in their communities.

The community meetings were also attended by traditional authorities and community councillors. The relevant stakeholder ministries at district level e.g. Ministry of Agriculture and Food Security, Disaster Management Authority, also participated in the community meetings. This was to make them aware of the project at resource centre and community levels. Representatives of the target communities participated in the project preparation completion workshops where they gave inputs.

With regard to sustainable implementation at community level, two modes of engagement were feasible in the context of the project. The first was a communal approach, especially for issues of rangelands, community woodlots, trees on pasture and rangelands. The second was intervention at individual household level. On both counts, it was critical that there be full involvement by the community and beneficiary households from the outset. The project engaged strongly with the communities during inception and momentum towards full participation was accelerated through the on-farm demonstration phase.

Lessons from the pilot phase of the project were that communities and farmers in all three pilot sites did not favour grants as practiced under many development projects in the country. The ‘*Neheletse* system’ would ensure that beneficiaries consider the inputs given to them as credit which requires repayment. However, other inputs would be grants. The use of OPVs ensures that beneficiaries plant seeds obtained from their production and this will be sustained from season to season. A major component of the project is strengthening capacity at national, district and community levels and this will ensure sustainability. This means capacity building empowers stakeholders at all levels to deal with climate change impacts and this will be sustained beyond the life of the project.

B. Coordination with other ongoing and planned initiatives

The project will build on the lessons learned from the FAO-supported TCP pilot project “**Strengthening capacity for climate change adaptation in the agricultural sector**” that focused on building the capacity of farmers to better respond to climate change impacts and increase food security. The project focused on subsistence farmers and has fostered the linkages between Government and Non- Governmental Organizations. Several successfully tested adaptation practices will be scaled-up through this LDCF project.

The project will closely work with the UNDP/LDCF and IFAD/LDCF projects as this is important for exchanging lessons and avoiding any duplication. These include the IFAD-managed **“Adaptation of Small-scale Agriculture Production (ASAP)”** which is under preparation and **“Reducing vulnerability from climate change in the Foothills, Lowlands and the lower Senqu River Basin”** proposal recently submitted by UNDP.

The IFAD LDCF project incorporates adaptation into the Smallholder Agriculture Development Programme which supports commercialization of Lesotho’s agriculture. The programme will focus on smallholder farmers who are already engaged in market-oriented production or have good potential to become commercially active. The nature of the agricultural sector in Lesotho at the moment is such that the majority of farmers/households are subsistence farmers (about 90% as mentioned in earlier sections) producing mainly for household consumption with little surplus for the market. And this group of stakeholders will be the main target of the proposed LDCF project. The projects will be complementary, one contributing to the commercial agriculture sub-programme of the National Action Plan for Food Security and the other to the ‘household’ food security sub-programme.

The focus of the UNDP-led proposal (which builds on the land rehabilitation programme of the Ministry of Forestry and Land Reclamation – MFLR) is on strengthening the tools and capacity of MFLR (at national and constituency/district level) **for mainstreaming climate change adaptation into land rehabilitation** (the main tool being a geo-based agro-ecological and hydrological information system), implementation of climate-smart land rehabilitation pilots and mainstreaming CCA into national land management strategies.

These projects will be implemented or involve more or less the same Ministries and Departments which provides an opportunity for coordination but also a risk of duplication. So an inter-institutional coordination arrangement has been agreed between the concerned Ministries. This will be established during project implementation stage. There will have to be strong interaction particularly between FAO and UNDP supported teams during preparation of these projects.

Close coordination is expected with the recently submitted LDCF/UNEP project on “Strengthening climate services in Lesotho for climate resilient development and adaptation to climate change (2nd phase of the LMS/GEF/UNEP LDCF NAPA Early Warning Project)”. The project objective is to strengthen the climate monitoring capabilities, early warning systems and human resources in Lesotho in order to effectively address climate impacts and better plan adaptation to climate change. The Lesotho Meteorological Services (primary executing partner), Disaster Management Authority, Ministry of Energy, Meteorology and Water Affairs are the implementing partners of the project. The outputs related data base development and assessment of risks and vulnerability will benefit from this project.

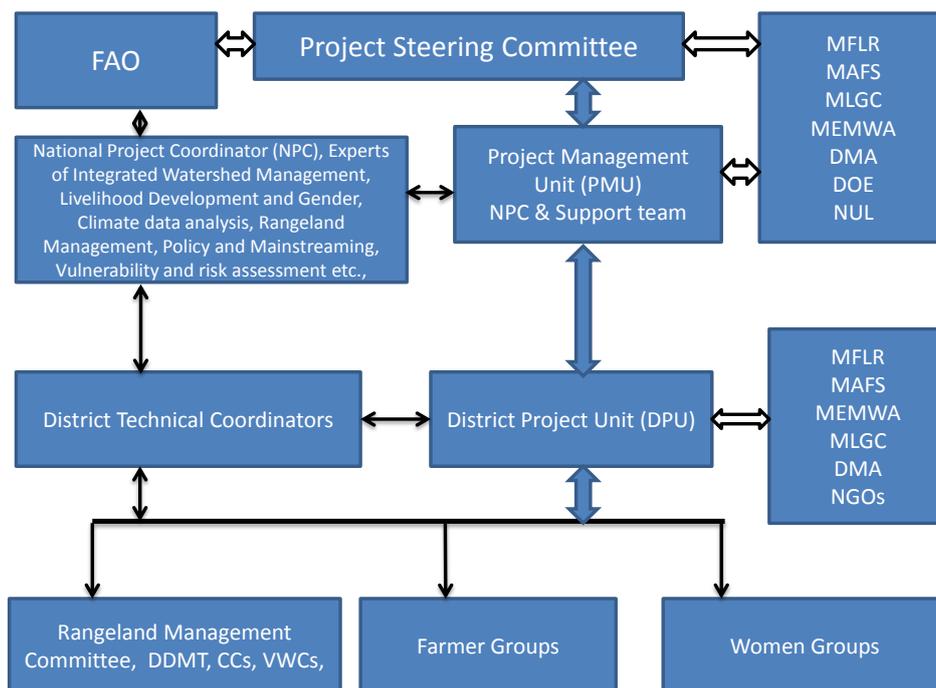
The project will build on lessons learned from other past and ongoing projects, including: the IFAD-supported SANReMP project that strongly focuses on natural resource management and economic agricultural activities; and the **“Health, Economic and Agriculture Livelihood training for Households in the Senqu River Valley- HEALTH SRV Project”** that aimed to improve the capacity of vulnerable rural households to cope with recurrent drought through improved agricultural production systems. Close coordination is expected with the World Bank project on **Smallholder Agricultural Development Project (SADP)** as FAO’s Investment Centre Division is closely involved in implementation support missions.

Coordination arrangement will be established with the activities supported by the Government of Lesotho under the Disaster Risk reduction funds provided by the Government of Japan. Specific collaboration arrangement will be established with programmes and projects under UNDP’s Environment and Energy unit. These include GEF funded projects on Sustainable Land Management and Lesotho Renewable Energy-Based Rural Electrification, and Japanese funded Africa Adaptation Programme. The three projects are implemented through the Ministry of Forestry and Land

Reclamation and the Ministry of Natural Resources. The project will also explore the merits and will look at the possible lessons learnt from the African Monitoring of Environment for Sustainable Development (AMESD) Programme - a partnership pan- African programme between the African Union Commission (AUC) and the European Union (EU).

4.2 IMPLEMENTATION ARRANGEMENTS

The proposed project will be implemented through a multi-stakeholder forum comprising of relevant government ministries, development partners, and non-government organizations. The project implementation will also be supported by various technical experts to ensure achievement of outcomes. As confirmed through the stakeholder analysis and validation workshop, these management arrangements will support the strengthening of institutions responsible for climate change adaptation issues. The following structure depicts the envisaged implementation arrangements:



Note: The block solid arrows represent existing Government institutional arrangements and their reporting lines. The block arrows with white fill represent the interaction between Government, International and Non-governmental agencies through different programmes or through already established mechanisms, the solid lines represent project based arrangement for technical support financed through the LDCF grant, The technical team is not a parallel structure, but will work within/with the Project Management Unit (PMU) at the national level and District Project Unit (DPU) at the district level.

Project Steering Committee (PSC): The Ministry of Forestry and Land Reclamation will be the primary executing partner of this project. The Execution arrangements for the project will include a multi-agency Project Steering Committee (PSC), comprising of MAFS, MLGC, DMA, DOE, NUL, MEMWA, FAO, UNDP, IFAD and NGOs. The Project Steering Committee will be chaired by the Principal Secretary (PS) MFLR. As chair of the Steering Committee, the Principal Secretary for MFLR will have the primary responsibility to provide overall directions.

The PSC will:

- ensure that all project activities and outputs are in accordance with the project document;
- review, amend (if appropriate) and endorse all Annual Work Plans and Budgets of the project;
- review project progress and achievement of planned results as presented in six-monthly Project Progress Reports, Project Implementation Reviews (PIRs) and Financial Reports;

- provide inputs to the mid-term and final evaluations, review findings and provide comments;
- advise on issues and problems arising from project implementation, submitted for consideration by the Project Management Unit or by various stakeholders;
- facilitate dissemination and integration of project outcomes into national policies and programmes as appropriate; and
- facilitate collaboration amongst stakeholders and ensure the timely availability of co-financing.

The Project Steering Committee will meet regularly, at least every three months, and extraordinarily whenever circumstances require. The National Project Coordinator (NPC) will serve as Secretary of the PSC with the responsibility to call meetings, distribute information and follow up on their recommendations. Activities relevant to a particular ministry or institution will be closely aligned with its regular functions and mandate. For example, the land use assessment and land use data base will be aligned with the existing GIS unit of the Ministry of Forestry and Land Reclamation and the tools and methodologies for vulnerability and risk assessment will be aligned with the Disaster Management Authority (DMA). This will ensure sustainability of and ownership of the specific activities by concerned ministries/institutions. Detailed consultations about the ownership of the individual activities have been carried out during the project preparation.

Project management structure and roles and responsibilities of executing partners

Project Management Unit (PMU): The daily management of the project will be entrusted to a Project Management Unit, comprised of a National Project Coordinator (NPC), National Technical Advisor (NTA), Livelihood specialist, Capacity building Specialist, M&E specialist, Data management Specialist. The Project Management Unit (PMU) will perform the tasks below::

- Formulation and coordination of the overall project implementation plan and annual work plans;
- Mobilization and coordination of consultants and other project inputs;
- Monitoring of technical inputs and general performance;
- Providing secretariat services to the PSC;
- Making arrangements for project evaluations, progress reporting and records keeping;
- Representation of the project at relevant national and international forums;
- Coordination with other national and regional initiatives and organizations.

A team of experts will work under the supervision of the National Technical Advisor (NTA) to provide support to the project management unit. Ad hoc technical advisory teams, comprised of both consultants and key technical government staff, will also support the PMU.

The National Project Coordinator (NPC): The NPC will be a senior staff member designated by MFLR, and will be the lead person responsible for ensuring smooth execution of the project on behalf of the Government of Lesotho. The salary and allowances of the NPC will be financed by the Government. The NPC is responsible to the Government for the successful implementation of the Project and the achievement of project results. The duties of the NPC include (i) acting as the responsible focal point at the MFLR; (ii) ensuring all necessary inputs from Government personnel are provided by MFLR and its outfits to enable implementation of the proposed component activities; (iii) reviewing and providing input to annual work plans and budgets in consultation/collaboration with FAO; and (iv) to participate in the selection of consultants.

National Technical Advisor (NTA) (Climate change adaptation and integrated watershed management): The NTA will directly support the NPC in the PMU and ensure integration of all relevant activities into the Project work plan and activities. The NTA reports to the BH on operational issues and to the LTO/LTU on technical issues. The NTA is a full time position for the entire duration of the project.

The NTA will support all aspects of the day-to-day execution of the Project. The NTA will also be responsible for providing technical advice and guidance in his/her area of technical expertise. The NTA will collaborate with the NPC in reporting on project progress, and will prepare semi-annual project progress reports and assist the FAO Lead Technical Officer (LTO) in the preparation of annual Project Implementation Reviews (PIRs). In addition the NTA will:

- Prepare consolidated annual work plans and budgets and draft consultant TORs;
- Ensure latest and best international practices and approaches are reflected in the planning and implementation of Project activities;
- Support the M&E specialist in the design and implementation of the M&E plan;
- Participate in recruitment, selection and supervision of local and international consultants;
- Support design of the Project's work with stakeholders in the pilot areas;
- Propose an approach to managing and sharing knowledge, and to identifying and disseminating lessons learned;
- Provide on-the-job capacity development to all members of the PMU;
- Prepare progress reports;
- Communicate, advocate and engage in policy dialogue.

District Project Unit (DPU): The District Project Unit (DPU) will comprise of the District Project Technical Team (DTT) and the District Technical Coordinator (DTC). The DTT will be drawn from MFLR, MAFS, DMA (DDMT), MEMWA, MOLGC, and will be responsible for developing seasonal and annual plans and budget, organizing meetings and trainings and providing overall technical support in project implementation. The team will also review the progress, monitor field activities and support local community mobilisers. The DPU will be responsible for overall reporting of the project to the PMU. While this multi-disciplinary team is expected to cooperate and collaborate in implementing this project, the primary agricultural extension and advisory services will be provided by the respective technical units (crops and livestock) of the Ministry of Agriculture and Food Security (MAFS). The Ministry of Forestry and Land Reclamation (MFLR) will take the lead in delivering the rangeland management and agro-forestry advisory services.

District Technical Coordinators (DTC): Three District Technical Coordinators (DTC) will be recruited by FAO and will be responsible for the coordination of all district level activities. The DTCs are the Project's key strategic mechanism for coordination and implementation of the project activities. The DTC will take the lead in communicating with local government and key stakeholders, advising on the preparation of local work plans, designing and running training for local government officials and DTT, designing local activities, trouble shooting at the local level, ensuring Project inputs are delivered effectively to local governments and Farmer groups, and ensuring linkages along the communication line as stipulated in the communication strategy.

Project site implementation: At project site, the project implementation will involve community councils (CCs), Village Disaster Management Teams (VDMTs), village water committees (VWCs), and village grazing associations (VGAs), Lesotho National Farmers Union (LENAFU), and the District agricultural cluster under the Federation of Lesotho Women Entrepreneurs (FELWE).

FAO's role and responsibilities, both as the GEF Agency and as an executing agency, including delineation of responsibilities internally within FAO

FAO will be the GEF implementing and executing agency. As the GEF Agency, FAO will be responsible for Project oversight to ensure that project implementation adheres to GEF policies and criteria, and that the Project efficiently and effectively meets its objectives and achieves expected outcomes and outputs in accordance with the Project document. FAO will report on Project progress to the GEF Secretariat and financial reporting will be to the GEF Trustee. FAO will closely supervise and provide technical guidance to the Project by drawing upon its capacity at the global, regional and national levels, through the concerned units at FAO-HQ, the Regional Office in Accra and the FAO Representation in Lesotho.

In addition, at the request of the Government of Lesotho, the project will be executed by FAO via its Direct Execution (DEX) modality in close consultation with MFLR. FAO, in consultation with the NPC, will deliver procurement and contracting services to the project using FAO rules and procedures, as well as financial services to manage the GEF resources.

The **FAO Representative in Lesotho** will be the **Budget Holder** (BH) responsible for the timely operational, administrative and financial management of the project. The Budget Holder, working closely with the PMU, the FAO Lead Technical Officer and Lead Technical Unit, will be responsible for:

- a) management of GEF resources in accordance with the Project Document, and approved Annual Work Plans and Budgets;
- b) procurement of goods and contracting of services for the project and financial reporting in accordance with FAO rules and procedures;
- c) preparation of annual/six-monthly budget revisions, as required, for submission to the LTO/LTU and the GEF Coordination Unit;
- d) preparation of six-monthly financial reports to be submitted to the GEF Unit and shared with the executing partners and the PSC;
- e) represent FAO in the PSC.

The BH will also be responsible for reviewing and giving no-objection to Annual Work Plans and Budgets (AWP/B), Project Progress Reports and co-financing reports submitted by the Project Management Unit, in consultation with the FAO Lead Technical Officer (LTO), Lead Technical Unit (LTU) and the GEF Coordination Unit.

The FAO Lead Technical Unit (LTU): The Climate, Energy and Tenure Division (NRC) of FAO will be the LTU/LTO within FAO for this Project and will provide overall technical guidance to its implementation.

FAO Lead Technical Officer (LTO): A Natural Resources Officer in NRC will be designated LTO. The LTO will work in close consultation with the FAO Budget Holder and with the National Project Coordinator (NPC). Under the general technical oversight of the LTU, the LTO will provide technical guidance to the Project team to ensure delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical backstopping from all the concerned FAO units represented in the Project Task Force. The LTO will:

- Review and provide clearance to TORs for consultancies, LOAs and contracts, in consultation with the LTU and relevant technical officers in FAO;
- Participate in the selection of consultants and firms to be hired with GEF funding;
- Review and provide technical comments to draft technical products/reports and, as necessary, ensure clearance by relevant FAO technical officers of final technical products delivered by consultants and contract holders financed by GEF resources before the final payment can be processed;
- Review and approve project progress reports submitted by the Project Management Unit to the BH;
- Support the BH in reviewing, revising and giving no-objection to AWP/B to be approved by the Project Steering Committee;
- Prepare the annual Project Implementation Review (PIR) report to be submitted to the LTU and the GEF Coordination (TCI) for clearance. The PIR will subsequently be submitted to the GEF Secretariat and Evaluation Office as part of the Annual Monitoring Review report;
- Field annual (or as needed) backstopping missions;
- With the LTU, review and clear TORs for the mid-term evaluation, participate in the mid-term workshop with all key project stakeholders, development of an eventual agreed adjustment plan in project execution approach, and supervise its implementation;

- With the LTU, review and clear TORs for the final evaluation, participate in the final project closure workshop with all key project stakeholders and the development of and follow up on recommendations on how to ensure sustainability of project outputs and results after the end of the project.

FAO Project Task Force (FAO-PTF): The BH will establish a multi-disciplinary PTF to support the project. Members of the task force will be responsible for supervision of activities in their area of technical competence in collaboration with the LTO and BH. The FAO-PTF will be led by the Budget Holder and include the LTU, LTO, the GEF Coordination Unit, and other technical units. The main role of the task force is to provide technical guidance to the LTO and the PMU for the implementation of the project, contribute to specific project activities as required, and troubleshoot should implementation issues arise.

FAO GEF Coordination Unit in Investment Centre Division (GCU): GCU will review and approve PPRs, annual PIRs and financial reports and budget revisions. The GCU will undertake supervision missions if considered necessary in consultation with the LTU, LTO and the BH. The PIRs will be included in the FAO GEF Annual Monitoring Review submitted to GEF by the GCU. The GCU will ensure that the project’s mid-term review and final evaluation meet GEF requirements by reviewing evaluation ToRs and draft evaluation reports. Should the PIRs or mid-term review highlight risks affecting the timely and effective implementation of the project, the GCU will work closely with the BH and LTO to make the needed adjustments in the project’s implementation strategy.

The **Investment Centre Division Budget Group (TCID)** will provide final clearance of any budget revisions. The **FAO Finance Division** will provide annual Financial Reports to the GEF Trustee and, in collaboration with the GEF Coordination Unit and the TCID Budget Group, call for project funds on a six-monthly basis from the GEF Trustee.

4.3 FINANCIAL PLANNING AND MANAGEMENT

4.3.1 Financial plan (by component, outputs and co-financier)

Table 4. Financial plan for each of the components

Component	Co-funders		GEF	Total
	FAO	Government		
Component 1: Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and climate-resilient livelihood strategies	150,000	800,000	241,888	1,191,888
Component 2: Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale	100,000	750,000	397,188	1,247,188
Component 3: Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds	200,000	3,500,000	1,469,742	5,169,742
Component 4: Strengthening diversified livelihood strategies and implementation of improved income generating activities at the community level	392,381	1,642,857	988,828	3,024,066

Component 5: Dissemination of best practices, project monitoring and evaluation	50,000	450,000	291,688	791,688
Project Management	44,619	357,143	203,360	605,122
Total	937,000	7,500,000	3,592,694	12,029,694

4.3.2 GEF/LDCF/SCCF Inputs

The GEF funds will finance inputs needed to generate the outputs and outcomes under the Project. These include: (i) local and international consultants for technical support and Project management; (ii) Strengthening of technical and institutional capacities and integrating adaptation into national food and agriculture policies, strategies and plans; (iii) assessment, monitoring and providing advance early warning information on vulnerabilities, risks of climate change and agrometeorological forecasts to assist better adaptation planning; (iv) LoA/contracts with technical institutions and service providers supporting the delivery of specific Project activities on the ground; (v) Improving awareness, knowledge and communication on climate impacts and adaptation; (vi) Prioritizing and implementing local investment by promoting Community Based Adaptation (CBA) to strengthen livelihood strategies and transfer of adaptation technology in targeted areas. Disseminating international flights and local transport and minor office equipment; and (vii) training and awareness raising material.

4.3.3 Government inputs

The Government of Lesotho, through the MFLR will provide in-kind support in terms of office facilities (including electricity, telephone and fax line, internet line facility, cleaning, etc.) and time of key staff, including the NPC. The district level offices will provide technical assistance, coordination and participation in project activities. The Government will also provide substantial investments into agriculture and livestock across all the selected districts. These investments are estimated to value in total of US\$ 7.5 million during the project period.

4.4.4 FAO inputs

FAO will provide technical assistance, backstopping, training and supervision of the execution of activities financed by GEF resources. The GEF project will complement and be co-financed by several projects and activities implemented by the FAO Representation in Lesotho funded by the FAO Technical Cooperation Programme (TCP) and by various donors through trust fund arrangements (see table below).

With a total value of USD 12,013,364 these contributions will be managed as an integral part of the GEF project by FAO and will be assessed and recorded each year by the Project team in accordance with GEF policies and procedures.

4.4.5 Other co-financiers inputs

Table 5. Co-financing and baseline projects and details of their activities and co-financing volume

Project name	Relevant activity	Co-financing volume (USD Millions)	Agency
Technical Support to the COMESA-EAC-SADC Programme on Climate Change Adaptation and Mitigation in	At national level, this will contribute to reversing trends in deforestation and adverse land use practices, applying	USD 500,000	FAO

the Eastern and Southern Africa Region SRO/RAF/307/COM	adaptation strategies for food security, the protection and sustainable use of water resources and promoting biodiversity. The technical support will contribute to the mainstreaming of specific adaptation activities in agricultural investment operations.		
Capacity building in agribusiness development: Lesotho National Farmers Union TCP/LES/3403 (13/VI/LES/222)	To contribute to food security by improving market access and increasing incomes of members of farmer associations at all levels	USD 437 000	FAO
Integrated Watershed Management (Poverty Alleviation) Project	It supports the afforestation and rehabilitation of existing forest resources, construction of water resource infrastructures, protection of wetlands and reseeded of degraded rangelands. Livelihood diversification, sustainable land and water management practices at the community level.	USD 7,500,000 for three districts for 4 years (activities worth of USD 2,500,000 per district)	Ministry of Forestry and Land Reclamation (MFLR), Government of Lesotho

4.4.6. Financial management of and reporting on GEF/LDCF/SCCF resources

Financial Records: FAO shall maintain a separate account in United States dollars for the Project's GEF resources showing all income and expenditures. Expenditures incurred in a currency other than United States dollars shall be converted into United States dollars at the United Nations operational rate of exchange on the date of the transaction. FAO shall administer the Project in accordance with its regulations, rules and directives.

Financial Reports: The BH shall prepare six-monthly project expenditure accounts and final accounts for the project, showing amount budgeted for the year, amount expended since the beginning of the year, and separately, the un-liquidated obligations as follows:

1. Details of project expenditures on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document, as at 30 June and 31 December each year.
2. Final accounts on completion of the Project on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document.
3. A final statement of account in line with FAO Oracle Project budget codes, reflecting actual final expenditures under the Project, when all obligations have been liquidated.

The BH will submit the above financial reports for review and monitoring by the LTO and the FAO GCU. Financial reports for submission to the donor (GEF) will be prepared in accordance with the provisions in the GEF Financial Procedures Agreement and submitted by the FAO Finance Division.

Budget Revisions: Semi-annual budget revisions will be prepared by the BH in accordance with FAO standard guidelines and procedures.

Responsibility for Cost Overruns: The BH is authorized to enter into commitments or incur expenditures up to a maximum of 20 percent over and above the annual amount foreseen in the Project budget under any budget sub-line provided the total cost of the annual budget is not exceeded.

Any cost overrun (expenditure in excess of the budgeted amount) on a specific budget sub-line over and above the 20 percent flexibility should be discussed with the GCU/TCIB with a view to ascertaining whether it will involve a major change in Project scope or design. If it is deemed to be a minor change, the BH shall prepare a budget revision in accordance with FAO standard procedures. If it involves a major change in the Project's objectives or scope, a budget revision and justification should be prepared by the BH for discussion with the GEF Secretariat.

Savings in one budget sub-line may not be applied to overruns of more than 20 percent in other sub-lines even if the total cost remains unchanged, unless this is specifically authorized by the GCU upon presentation of the request. In such a case, a revision to the Project document amending the budget will be prepared by the BH. Under no circumstances can expenditures exceed the approved total Project budget or be approved beyond the NTE date of the project. **Any over-expenditure is the responsibility of the BH.**

Audit: The Project shall be subject to the internal and external auditing procedures provided for in FAO financial regulations, rules and directives and in keeping with the Financial Procedures Agreement between the GEF Trustee and FAO. The audit regime at FAO consists of an external audit provided by the Auditor-General (or persons exercising an equivalent function) of a member nation appointed by the Governing Bodies of the Organization and reporting directly to them, and an internal audit function headed by the FAO Inspector-General who reports directly to the Director-General. This function operates as an integral part of the Organization under policies established by senior management, and furthermore has a reporting line to the governing bodies. Both functions are required under the Basic Texts of FAO which establish a framework for the terms of reference of each. Internal audits of impress accounts, records, bank reconciliation and asset verification take place at FAO field and liaison offices on a cyclical basis.

4.4. PROCUREMENT

Procurement planning should be in accordance with the Rules and Regulations of FAO. It requires analysis of needs and constraints, including forecast of the reasonable timeframe required to execute the procurement process. Procurement and delivery of inputs in technical cooperation projects follow FAO's rules and regulations for the procurement of supplies, equipment and services (i.e. Manual Sections 502 and 507). *Manual Section 502*: "Procurement of Goods, Works and Services" establishes the principles and procedures that apply to procurement of all goods, works and services on behalf of the Organization, in all offices and in all locations, with the exception of the procurement actions described in Appendix A – Procurement Not Governed by Manual Section 502. *Manual Section 507* establishes the principles and rules that govern the use of Letters of Agreement (LoA) by FAO for the timely acquisition of services from eligible entities in a transparent and impartial manner, taking into consideration economy and efficiency to achieve an optimum combination of expected whole life costs and benefits.

As per the guidance in FAO's Project Cycle Guide, the BH will draw up an annual procurement plan for major items which will be the basis of requests for procurement actions during implementation. The plan will include a description of the goods, works, or services to be procured, estimated budget and source of funding, schedule of procurement activities and proposed method of procurement. In situations where exact information is not yet available, the procurement plan should at least contain reasonable projections that will be corrected as information becomes available.

4.5 MONITORING AND REPORTING

Monitoring and evaluation of progress in achieving project results and objectives will be done based on the targets and indicators established in the project Results Framework (RF). The project Monitoring and Evaluation Plan has been budgeted at USD 135 500 based on the activities envisioned in the project document. Monitoring and evaluation activities will follow FAO and GEF monitoring and evaluation policies and guidelines. The Project monitoring and evaluation approach will also

facilitate learning and mainstreaming of project outcomes and lessons learned into good practice as well as national and local policies, plans and practices.

Impact of the field demonstrations on the improvement of adaptive capacity and enhancement of the economic benefit by the adaptation practices will be assessed based on the feedback from farmer groups and household survey. The data will be compared with the baseline study collected at the beginning. The good practices will be screened based on the indicators: environment friendliness, potential to reduce the impacts of climate risks, economic viability, sustainability, social acceptability, gender sensitivity, income generation, enterprise diversification, seasonal relevance and community's need.

4.5.1 Oversight and monitoring responsibilities

Monitoring and evaluation of adaptation project poses challenge due to wider ramification of the costs and benefits with externalities and spill-overs. Monitoring of the project outputs and outcomes will be done regularly throughout the project period. Output indicators and outcome indicators will be used for monitoring. The monitoring measures will be the following: 1) Trimester and annual reports of project implementation using approved format; 2) Trimester and annual review of the outputs and possible outcomes; 3) Progress review at the regional level and in district level line agencies; 4) National level progress review; 5) Project Steering Committee meeting in half yearly interval; 6) Field visits and observations by the district technical teams; and 7) Discussions with the farmers groups.

4.5.2. Indicators and information sources

The indicators for monitoring and assessment of the project outcomes and outputs were packaged using the LDCF Adaptation Monitoring and Assessment Tool (AMAT). Collection of data on indicators relevant to the project will be employed as per the M & E plan summary provided in section 4.5.4. In addition, the existing sources of data and information available at national level are presented in Annex VI. The data collection will be followed with a combination of household level survey and participatory approaches. Participatory methods allow the farmers groups to identify changes in behaviour resulting from the adaptation project. It will also help to look at distributional effects through who has benefited and who has not. This method also helps us to identify the strengths and weaknesses of the projects for future intervention, replication and up-scaling.

4.5.3 Reporting schedule

Specific reports that will be prepared under the M&E programme are: (i) project inception report; (ii) Annual Work Plan and Budget (AWP/B); (iii) PPRs; (iv) annual PIR; (v) technical reports; (vi) co-financing reports as necessary; and (viii) terminal report. In addition, assessment of the GEF-Adaptation Tracking Tools against the baseline will be required at midterm and final project evaluation.

Project Inception Report: Immediately after the IW, the PMO will prepare a Project inception report in consultation with the BH and other project partners. The Inception Report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the IW. To insure smooth transition between project design and inception, the IW and work planning process will benefit from the extensive input of parties responsible for providing technical support to the original project design.

The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. It will also include

a detailed first year AWP/B, a detailed project monitoring plan based on the monitoring and evaluation plan summary presented below. The draft inception report will be circulated to the LTO and the GCU and the NPD for review and comments before its finalization, no later than one month after the IW. The report should be cleared by the BH, LTO and the GCU and uploaded in Field Programme Management Information System (FPMIS) by the BH.

Annual Work Plan and Budget (AWP/B): The draft of the first AWP/B will be prepared by the PMO in consultation with the Project Task Force and reviewed at the project IW. IW inputs will be incorporated and the PMO will submit a final draft AWP/B within two weeks of the IW to the BH. For subsequent AWP/B, the PMO will organize a project progress review and planning meeting for its review. Once comments have been incorporated, the BH will circulate the AWP/B to the LTO and the GCU on a no-objection basis prior to uploading in FPMIS by the BH. The AWP/B must be linked to the project's RF indicators so that the project's work is contributing to the achievement of the indicators. The AWP/B should include detailed activities to be implemented to achieve the project outputs and output targets and divided into monthly timeframes and targets and milestone dates for output indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year.

Project Progress Reports (PPR): PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the project's Results Framework. The purpose of the PPR is to identify constraints, problems or bottlenecks that impede timely implementation and to take appropriate remedial action. In consultation with the PCC, the PMO will prepare semi-annual PPRs and submit them to the BH in a timely manner. Each PPR will be submitted by the BH to the LTO and GCU for review on a no-objection basis. In the event of LTO/GCU comments, the PMO will incorporate them and the revised PPR is re-submitted to the LTO for final endorsement prior to final approval by the GCU, uploading in FPMIS and sharing with stakeholders.

Annual Project Implementation Review (PIR): The PMO will prepare the annual PIR covering the period July (the previous year) through June (current year). The draft PIR will then be reviewed by the LTO and subsequently submitted by the BH to the GCU for review and approval no later than 10 September each year. The GCU will upload the final report on FPMIS and submit it to the GEF Secretariat and Evaluation Office as part of the Annual Monitoring Review report of the FAO-GEF portfolio. The GCU will provide the updated format when the first PIR is due.

Technical Reports: Technical reports will be prepared as part of Project outputs and to document and share project outcomes and lessons learned. The drafts of any technical reports must be submitted by the PMO to the BH who will share it with the LTO. The LTO will be responsible for ensuring appropriate technical review and clearance of said report for uploading to FPMIS. Copies of the technical reports will be distributed to Project partners as appropriate.

GEF 5 Tracking tool: Following the GEF policies and procedures, the Climate Change Adaptation LDCF Adaptation Monitoring and Assessment Tool (AMAT) will be submitted at three moments: (i) with the Project Document; (ii) at the project's mid-term evaluation; and (iii) with the Project's terminal evaluation or terminal report.

Co-financing Reports: The PMO will be responsible for collecting the required information and reporting on in-kind and cash co-financing as indicated in the project document/CEO Request. The PMO will submit the report to the BH in a timely manner on or before 31 July of every year covering the period July (the previous year) through June (current year).

Terminal Report: Within two months before the end date of the Execution Agreement, the PMO will submit to the BH a draft Terminal Report. The main purpose of the Terminal Report is to give guidance at ministerial or senior government level on the policy decisions required for the follow-up of the project, and to provide the donor with information on how the funds were utilized. The Terminal Report is

accordingly a concise account of the main products, results, conclusions and recommendations of the project, without unnecessary background, narrative or technical details.

The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for insuring sustainability of project results. Work is assessed, lessons learned are summarized, and recommendations are expressed in terms of their application to Lesotho's ongoing work to develop PFM. This report will specifically include the findings of the final evaluation. A final Project review meeting should be held to discuss the draft Terminal Report before it is finalized by the PMO and approved by the FAO LTO and the GCU.

4.5.4. Monitoring and evaluation plan summary

Table 6: Summary of the main M&E reports, responsible parties, timeframe and costs

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Inception Workshop, annual planning meetings, final project workshop	PMU, supported by the LTO/LTU, BH	Inception workshop within three months of project start up, annual workshops as per the schedule and work plan agreed and final workshop a month before closure of the project	Total five workshops/planning meetings @ US\$ 2500/event. Total cost works out to US\$ 12,500.
Baseline survey for impact evaluation (questionnaire design, survey, travel expenses)	PMU and external experts. The project team and LTO/LTU to provide support to design the survey questionnaire and collate data relevant to AMAT indicators.	Within three months from start of the project	USD 20 000
Mid-term Evaluation	External experts in consultation with the project team and other partners. FAO Office of Evaluation will make arrangements for the evaluation.	After completion of two years of implementation	USD 40 000 for independent consultants and associated costs. In addition the agency fee will pay for expenditures of FAO staff time and travel
Final impact evaluation	External independent consultants. FAO Office of Evaluation will make arrangements for the evaluation.	At the end of project implementation	USD 40 000 for external, independent consultants and associated costs. In addition the agency fee will pay for expenditures of FAO staff time and travel.
Supervision visits and rating of progress in PPRs and PIRs	LTO, other participating units	Annual or as required	The visits of the LTO/LTU will be paid by GEF agency fee. The visits of the NPD and NTC will be paid from the project travel budget
Monitoring by the district level agencies	The district level agencies in close collaboration with concerned implementing partners and PMU will coordinate the monitoring in collaboration with the technical experts.	Twice in a year	USD 12 000 (USD 4000 for each district)

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Project M & E reports (includes project progress reports, co-financing reports, terminal reports)	PMU, with inputs from NPC, NTA and other partners. The project implementation report by PMU supported by the LTO/LTU and cleared and submitted by the GCU to the GEF Secretariat.	Semi-annual/annual or as required	USD 11 000 (as completed by NTC and PMU)
Terminal Report	NTC, LTO/LTU, TCSR Report Unit	At least two months before the end date of the Execution Agreement	From respective contracts and consultants working for the project.
Total Budget			USD 135 500

4.6 PROVISION FOR EVALUATIONS

An independent Mid-Term Evaluation (MTE) will be undertaken towards the middle of Project Year Three to review progress and effectiveness of implementation in terms of achieving Project objective, outcomes and outputs. Findings and recommendations of this evaluation will be instrumental for bringing improvement in the overall project design and execution strategy for the remaining period of the project's term if necessary. FAO (the Office of Evaluation) will arrange for the MTE in consultation with project management. The evaluation will review the effectiveness, efficiency and timeliness of project implementation; analyse effectiveness of partnership arrangements; identify issues requiring decisions and remedial actions; propose any mid-course corrections and/or adjustments to the implementation strategy as necessary; and highlight technical achievements and lessons learned derived from project design, implementation and management.

An independent final evaluation will be carried out three months prior to the terminal review meeting of the project partners. The final evaluation would aim to identify the project impacts and the sustainability of project results and the degree of achievement of long-term results. This evaluation would also have the purpose of indicating future actions needed to expand on the existing project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to management authorities responsible for related issues to ensure replication and continuity of the processes initiated by the project.

4.7 COMMUNICATION AND VISIBILITY

Giving high visibility to the project and ensuring effective communications in support of the Project's message is to be addressed through a number of activities that have been incorporated into the Project design. These include: (i) the recruitment of one PMU staff member responsible for communications and knowledge management; (ii) the preparation of documents and communication tools that capture the Project's economic, ecological and social benefits; (iii) two high level national conferences to raise awareness and lobby for participatory SFM, and; (iv) several awareness raising activities. These inputs and activities will be integrated into the Project Workplan, and as such, will come out of the Project's technical activities rather than be stand-alone activities.

SECTION 5 – SUSTAINABILITY OF RESULTS

5.1 SOCIAL SUSTAINABILITY

All relevant stakeholders at national and district level were consulted during the project design stage. These stakeholders included government ministries, non-government organizations, farmer organisations and development partners. Stakeholder ministries were briefed and made commitments that they will strive to achieve the project objectives through collaboration. All relevant stakeholders were appraised about the project during the inception and project preparation completion workshops. In order for sustainable implementation of the project at community level, community meetings were held in the project sites and the project introduced to them. Community members had inputs into what livelihoods, and integrated water management strategies they wished to be introduced in their communities.

The community meetings were also attended by traditional authorities and community councillors. The relevant stakeholder ministries at district level e.g. Ministry of Agriculture and Food Security, Disaster Management Authority, also participated in the community meetings. This was to make them aware of the project at resource centre and community levels. Representative of the target communities participated in the project preparation completion workshops and have made critical inputs to enhance sustainability of income generating activities.

Lessons from the pilot phase of the project were that communities and farmers in all three pilot sites did not favour grants as practised under many development projects in the country. The '*Neheletse*' system would ensure that beneficiaries consider the inputs given to them as credit which requires repayment. However, other inputs would be grants. The use of OPVs ensures that beneficiaries plant seeds obtained from their production and this will be sustained from season to season. A major component of the project is strengthening capacity at national, district and community levels and this will ensure sustainability. This means capacity building empowers stakeholders at all levels to deal with climate change impacts and this will be sustained beyond the life of the project.

5.2 ENVIRONMENTAL SUSTAINABILITY

The Project is designed to yield environmental benefits. The Project aims to improve natural resources, agricultural production systems and rangelands. The Project also aims to contribute directly to sustainable management of agricultural resources. Hence the Project should only have positive impacts on the environment. There is no reason to expect that any of the Project activities should lead

to pollution, watershed degradation, the introduction of alien species or any other form of environmental damage.

5.3 SUSTAINABILITY OF CAPACITIES DEVELOPED

The Project builds on a proven approach to develop capacity of farmer groups through FFS. The Government and FAO have been working on FFS for several years, and have developed a full approach to develop this capacity. The Project works with and through the local government structure to develop their capacity to take on the Project challenges after the FAO and GEF funding is completed. Notably, the Project works with the farmer groups at the **Community Councils**. The Government is committed to establishing and equipping these, and in recent years it has developed these, establishing more than twenty. This Project will support these to perform their mandate – that is a *capacity development-by-doing* approach. After this Project, the Farmer Groups will have the technical and organizational skills.

5.4 APPROPRIATENESS OF TECHNOLOGY INTRODUCED

This Project is not technology centred. However, new methods and practices will play an important role in helping the FUGs to develop. These include forest practices that have already been piloted in Lesotho and have been proven to be locally suitable. There is no reason to expect that any of the practices/methods introduced and developed will be inappropriate. This situation will be monitored using standard FAO procedures and mechanisms.

5.5 REPLICABILITY AND SCALING UP

The livelihoods strategies to be introduced in the target communities have been tested in the country and in the pilot phase of the project as well as being suggested by the communities during community meetings. The inputs used in the technologies are locally available. The field demonstrations to be conducted will show the communities technologies that are feasible under local conditions and can be replicated. The technologies can also be easily up-scaled all over the country.

ANNEX 1: RESULTS MATRIX

Component 1: Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and climate-resilient livelihood strategies

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
Outcome 1.1 Strengthened technical capacity in MFLR, MAFS MNR, MLGC, DMA and NUL at national and district levels and community representatives on climate change adaptation and integrated watershed management	Number and type of targeted institutions with increased adaptive capacity to reduce risks of and response to climate variability	Limited training programmes organized at the watershed scale (score of 1 for indicator 2.2.2 of AMAT tool)	Score of 2 – Initial awareness raised	Tools and refined training packages ready (score of 2)	Implementation of training packages at the national and district levels (score of 3 substantial training for practical applications)	Mainstreaming training into Government's regular capacity development actions (score of 4 knowledge effectively transferred)	The national and district level staff are capable of implementing the adaptation projects and programmes	M&E reports.	Government is willing to mainstream capacity development actions into their regular activities
Output 1.1.1 National level MFLR, MAFS, MNR, MLGC, DMA and National University of Lesotho (NUL) staff and district level forestry and natural resources staff trained on climate change adaptation, integrated watershed management and community mobilization	Number of national level staff within MFLR, MAFS, MNR, MLGC, DMA and National University of Lesotho (NUL) staff at national and district level trained on climate change adaptation and integrated watershed management	FAO organized an introductory 3 days training in 2011, but focus on water shed related issues were minimum.	Training needs assessment, Preparation of draft curriculum and training manual; conduct of the first phase of training in 2 batches (30 participants each) at the national level and three batches at district levels	Refinement of the curriculum	Second phase of training in 2 batches (30 each) at the national level and 3 batches at the district level	Finalization of the training manual and integration into the regular training programmes	60 Government staff trained at the national level and 90 staff trained at the district levels	Training records, M&E reports	GoL maintains climate change action on adaptation as priority within development policy.
Output 1.1.2 Training to the local representatives from community based	Number of farmer groups and group representatives	Community level training activities are	First phase of training to CBOs and their representatives	First phase of training to remaining 4 communities	Second phase of the training to 12 communities	Second phase of the training to 12 communities	24 farmer groups (1200 household) and 60	Training records, M&E reports, Community mobilization	Community representatives understand and access necessary

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
organizations (CBOs) on good practice examples of sustainable land and water management, water harvesting, diversified livelihood strategies and range resources management (at least 24 farmer groups (1200 farm households) and 20 representatives in each of the three livelihood zones (60 representatives) and 20 representatives in each of the three livelihood zones (60 representatives) will be trained).	from CBOs trained on good practices of sustainable land and water management, water harvesting, diversified livelihood strategies and range resources management	very limited.	in 4 communities in each district (4 x 3 = 12)	(4 x 3 = 12)	trained in year 1.	trained in second year	representatives	reports	resources to implement the new knowledge gained from the training programmes.

Component 2: Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
Outcome 2.1 Improved data, tools and methods for assessment of impact of climate change on land suitability and land use, vulnerability and risk at the national/district	Risk and vulnerability assessment conducted. Updated risk and vulnerability assessment	Currently no comprehensive data bases available for use for policy and operational decisions and are not systematically	The Government agencies aware of what data sets are in place at the country level	The national implementing partners are exposed to new data bases and analytical tools and methods	Data base in place	The government agencies are capable of managing the data independently and update them when required	The Government agencies share the data to users and data sets are effectively used for decision making (The end project	M & E reports	The government would sustain the technical and operational capacity through their own budgets

level implemented focusing on most vulnerable watersheds	Relevant risk information disseminated to stakeholders	disseminated					target is to ensure the value of 1 for all three indicators – please refer the AMAT tool)		
Output 2.1.1 Livelihood and land use (crop, livestock, agro-forestry) data base developed for most vulnerable watersheds (database will be established in Ministry of Forestry and Land Reclamation and linked to potential users at the national level) and relevant staff trained (at least 30 core staff)	Data base and number of land use assessment conducted Number of national level staff trained	Currently no database exists No database training organized so far in the country	Assessment and conduct of feasibility study Data collection and mapping Training manual preparation	Assessments, data collection and analysis Conduct of training programme to selected staff	Data base design	Data quality checking and validation Update of data base and second phase of training to the staff	A comprehensive database available for use At least 30 national level staff trained and a manual validated and packaged	M&E reports, MFLR and the validation reports	The government agencies cooperate and regularly update the database
Output 2.1.2 Vulnerabilities and risks (current and future) assessed for the selected watersheds in 3 livelihood zones and spatial information on vulnerability available (at Disaster Management Authority) to facilitate adaptation planning by the Government and	Number of watersheds vulnerability and risks assessments conducted A product on spatial information on vulnerability Number of vulnerabilities and risks assessment trainings	No assessments conducted at the watershed scale No targeted training conducted to the district level staff	Data collection, downscaling for assessment of vulnerabilities and risks Synthesis of training resources and review of training manuals	Design a methodology and conduct of assessment Integration of the results of the analysis from output 2.2.1 into the training resources	Delivery of products to the target watersheds Conduct of the training to the district level staff	- Second phase of the training to the district level staff	At least 70% of the selected watersheds have comprehensive vulnerability and risks assessments At least 30 staff trained on use of the spatial information products for the decision making	Vulnerability and risks assessment products M&E reports of MFLR Vulnerabilities and risks assessments reports, M&E reports, DMA, MFLR	Sufficient data available and shared by concerned departments for analysis The district level staff are available for the training and motivated to make use of products for better informed decision making

relevant staff trained (total 30 staff – 10 staff from each district).	conducted								
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Component 3: Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
Outcome 3.1: Sustainable land and water management (SLM/W) practices (soil erosion control, soil and water conservation, water harvesting, run-off reduction, vegetative cover, range resource management) successfully adopted in selected watershed and catchments. (Total beneficiaries - 1200 households and 4800 individuals and total area covered will be 2400 hectares).	Percent target groups adopting adaptation technologies by type (refer AMAT indicators 3.1.1.1 & 3.1.1.2)	There are very few households have the capacity to reduce the impacts to some extent (only those having off-farm employment)	The local communities aware of the importance of SLM/W for reducing the impacts of climate variability	At least 25% of the selected communities are capable of implementing the SLM/W practices	At least 50% of the selected communities are capable of implementing the SLM/W practices	At least 75% of the selected communities are capable of implementing the SLM/W practices	The SLM/W practices are successfully demonstrated in all selected 24 communities and are being continued even after end of the project.	Monitoring and Evaluation reports	The SLM/W practices to be introduced to the communities are relevant and are capable of reducing the vulnerability and impacts
Output 3.1.1: Adaptive land use and sustainable land and water management practices implemented. (1200 households and 1200 hectares)	Number of communities practicing land use and sustainable land and water management practice	No communities practice land use and sustainable land and water management practice in selected watersheds	At least 3 communities in practice in land use and sustainable land and water management practice	At least 7 additional communities in practice in land use and sustainable land and water management practice	At least 8 additional communities in practice in land use and sustainable land and water management practice	At least 6 additional communities in practice in land use and sustainable land and water management practice	All 24 communities in practice in land use and sustainable land and water management practice	Field monitoring and supervision; M&E reports; Dept of Soil and Water Conservation (DSWC), MFLR	Community members are cooperative and agree to work as their sweat (in-kind) contributions.
Output 3.1.2:	At least 150	No households	At least 20 hh	At least 50	At least 50	At least 30	All 150 hh	Stone built water	Community

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
Improved water harvesting structures at the household level implemented	households possess water harvesting structures	possess water harvesting structures	possess water harvesting structures	additional hh possess water harvesting structures	additional hh possess water harvesting structures	additional hh possess water harvesting structures	possess water harvesting structures	tanks with irrigation systems and roof tanks in place Dept of Soil and Water Conservation, MFLR	members are cooperative and agree to work as their sweat (in-kind) contributions
Output 3.1.3: Improved vegetative cover and range resource management measures adopted to improve productive use of marginal lands (600 households and 2400 individuals and cover a total area of 1200 hectares)	At least 10% improvement in vegetative cover in 24 communities	Recommended stocking rates Animal Unit (AU)/ha: Thaba Tseka -5.6; Quthing – 6.0; Mafeteng – 7.8	Preparatory activities implemented to improve vegetative cover in all 24 communities	At least 3% improvement in vegetative cover in 24 community groups	At least 5% improvement in vegetative cover in 24 groups	At least 7% improvement in vegetative cover in 24 communities	At least 10% improvement in vegetative cover in all 24 community groups	Grazing associations/ schemes effectively in control and their reports. Range assessment reports; Dept of Range Resources Management	Community Councils and Chiefs delegate grazing control powers to grazing associations. Range condition monitoring is carried out annually

Component 4: Strengthening diversified livelihood strategies and implementation of improved income generating activities at the community level

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
Outcome 4.1: Diversified livelihood strategies and small scale and household level income generating activities successfully demonstrated and adopted by 24 target communities.(benefit 750	Households and communities have more secure access to livelihood assets % increase per capita income of farm households due to adaptation measures applied	2 – Poor access to livelihood assets No or limited income from diversified livelihood activities. The baseline income is very low due to low	Selected communities aware of the livelihood diversification and measures to protect their livelihood activities	20% of the selected communities are capable of increasing their income by 10% during the second year	40% of the selected communities are capable of increasing their income by 20% during the third year	60% of the selected communities are capable of increasing their income by 40% during the fourth year	At least 60% of the selected communities increase their household income by 40% (3 – 4) moderate to secure access to livelihood assets (Refer	Household survey and project M & E reports with AMAT indicators	The diversified livelihood strategies to be implemented are capable of increasing the income of the households

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
households (3000 individuals). Area covered under this investment 375 hectares).		levels of yield (~450 kg/ha)					AMAT tool)		
Output 4.1.1: Community participation ensured and introductory sessions conducted and small-scale household level income generating activities introduced to 750 households	Number of communities with active participation Number of introductory sessions Number of household level income generating activities	No active participation in community level activities and no sessions adopt household level income generating activities	Introductory sessions conducted in all 24 communities	At least 12 communities established small scale household level income generating activities	Additional 12 communities established small scale household level income generating activities	All 24 communities/ households practices small scale income generating activities	Sustainable mechanisms established to promote small scale income generating activities	M & E reports and independent evaluation	Suitable income generating activities are identified and communities are willing to adopt
Output 4.1.2: Field demonstration of locally relevant multi-purpose agro-forestry to protect livelihood systems implemented and adopted (375 hectares)	Number of field demonstrations on multi-purpose agro-forestry systems conducted Number of communities adopted the improved livelihood protection practices	There is no existing field demonstrations organized None of the selected communities adopted improved practices	Field demonstrations implemented in 8 communities covering three livelihood zones and at least 7 communities are capable of adopting the practice successfully	Field demonstrations planned and conducted in additional 8 communities and at least 7 communities are capable of adopting the practice successfully	Field demonstration planned and conducted in 8 communities and at least 7 communities are capable of adopting the practice successfully	All 24 communities aware of locally relevant multi-purpose agro-forestry systems for their livelihood protection and adopted by the district level institutions	Field demonstration conducted in all 24 communities with their active participation and replication strategy developed and agreed by the district level institutions	Field demonstration and evaluation reports	Locally relevant multi-purpose agro-forestry systems are available and preferable by the communities

Component 5: Dissemination of best practices, project monitoring and evaluation

Results chain	Indicators	Baseline	Milestones	End of	Means of	Assumptions
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			Year 1	Year 2	Year 3	Year 4	project target	verification and responsibility	
Outcome 5.1: Stakeholders and communities aware of improved SLM/W practices, livelihood diversification and household level income generating practices through wide dissemination	Strengthened capacity to transfer appropriate adaptation technologies (refer the indicator 3.2.2 of AMAT tool)	A score of 1 means no capacity achieved	Initial awareness raising and baseline assessments	Measures in place to increase the capacity to transfer appropriate technology	Moderate capacity achieved (AMAT score of 2)	High capacity achieved (AMAT score of 3)	The implementing partners are capable of transferring the technology to the beneficiaries	Communication strategy, case studies and data bases available in respective implementing partners	The adaptation technologies are relevant to the selected communities
Output 5.1.1 A communication strategy established in close collaboration with the MOFLR, MAFS, MNR, Ministry of Local Government and Cheiftainship (MLGC) and NUL and implemented	Communication strategy established and endorsed by the stakeholders and number of communication materials developed	There is no communication strategy currently available	Initial consultation workshops conducted with the relevant stakeholders in all three districts and at the national level and feedback from local community representatives incorporated	Draft communication strategy prepared and circulated for feedback from the implementing partners	Final communication strategy endorsed by the Government and ready for implementation and Communication materials developed based on the field activities and results of the field demonstrations incorporated	The communication strategy implemented and updated based on the experience and lessons learned and successful case studies documented and widely distributed among the development partners	A communication strategy established and adopted by all stakeholders and communication materials relevant to all successful SLM/WM practices and case studies documented and widely communicated	Reports of the consultation workshops and final communication strategy document and printed materials available with all stakeholders and community groups	Stakeholders are willing to adhere to the strategy; The communication materials are easy to understand and useful to replicate the practices by the national and district level stakeholders
Outcome 5.2: Project implementation based on results based management and dissemination of results for future upscaling (replication)	Monitoring and dissemination of adaptation for scaling up	There are limited data available to properly monitor the impact of the project	Baseline studies and initial assessments	Mid-term evaluation	Publication of results and wider dissemination	Final evaluation Replication and up scaling strategy discussed with implementing partners	The replication and up scaling strategy agreed and the results of the final evaluation integrated	M & E baseline reports, mid-term and final evaluation reports and replication and up scaling strategy	The implementing partners are willing to up-scale and replicate the successful interventions

Results chain	Indicators	Baseline	Milestones				End of project target	Means of verification and responsibility	Assumptions
			Year 1	Year 2	Year 3	Year 4			
5.2.1 Systematic collection of field based data to monitor project outcome indicators at all levels and evaluation conducted	<p>Indicator tracking table populated quarterly</p> <p>Project Implementation review, midterm and final evaluations conducted</p> <p>Number of publications based on field experiences to be used for recommendations</p>	<p>Generic data available and provided in annex, but not specific to the watersheds</p> <p>There are few examples available based on the FAO TCP project completed in 2011.</p>	<p>Baseline studies conducted and document available within six months</p> <p>Compilation of recommendations</p>	<p>One midterm evaluation</p> <p>Half yearly publication of newsletters and tested good practice examples for recommendations</p>	<p>Half yearly publication of newsletter</p> <p>1 video documentaries produced</p>	<p>One final evaluation</p> <p>Half yearly publication of newsletter</p> <p>2 video documentaries produced</p>	<p>All baseline studies completed</p> <p>The evaluation completed as per the standards</p>	<p>Base line data reports</p> <p>Evaluation reports</p>	<p>MFLR's Information Unit will have the capacity in terms of equipment</p> <p>MFLR Information Unit will play an active role; these videos will be placed on MFLR and FAO websites</p>

ANNEX 2: WORK PLAN

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
Component 1: Strengthening technical capacity of national and district level staff and institutions on sustainable land and water management and climate-resilient livelihood strategies																		
Output 1.1.1 National level MFLR, MAFS, MEMWA, and National University of Lesotho (NUL) staff and district level forestry and natural resources staff trained on climate change adaptation, integrated watershed management and community mobilization	<i>a. Establish a multi stakeholder project steering committee (PSC), PMU and DPU</i>	MFLR																
	<i>b. Develop comprehensive stakeholder involvement plan</i>	MFLR, MAFS, MEMWA, NUL FAO, UNDP, IFAD,																
	<i>c. Develop a training plan for the national level institutions and assessment of training needs</i>	MFLR, MAFS, MEMWA, NUL																
	<i>d. Preparation of training resources and testing</i>	MFLR, Technical Experts																
	<i>e. Implementation of training activities at the national level</i>																	
	<i>f. Develop a training plan and assessment of training needs at the district levels</i>	MFLR, Technical Experts																
	<i>g. Prepare customised training packages for district level staff</i>																	
	<i>h. Needs based implementation of training activities in all three districts</i>	MFLR, Technical Experts																
	<i>Ei. Integration of training resources into regular training programme</i>																	
Output 1.1.2 Training to the local representatives from community based organizations (CBOs) on good practice examples of sustainable land and water management, water harvesting, diversified livelihood strategies and range resources	<i>a. Develop a training plan for the community level</i>																	
	<i>b. Prepare customised training packages</i>																	
	<i>a. Needs based provision of</i>																	

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
management (at least 24 farmer groups (1200 farm households in each of the 3 livelihood zones	<i>training programme to the community and its representatives</i>																	
	<i>b. Preparation of relevant materials to be integrated with the districts and national level agencies for replication in other districts</i>	MFLR, Technical Experts																
Component 2: Assessing vulnerability of livelihoods and impacts of climate change on land suitability and use at watershed scale																		
2.1.1 Livelihood and land use (crop, livestock, agro-forestry) data base developed for most vulnerable watersheds (database will be established in Ministry of Forestry and Land Reclamation and linked to potential users at the national level) and relevant staff trained	<i>a. Assessment of existing land use and livelihood database and strengths and weaknesses</i>	DMA, MFLR, MAFS, LSPP																
	<i>b. Design of a comprehensive database model</i>																	
	<i>c. Selection of indicators and data sources for compiling the database</i>																	
	<i>d. Implementation of database management system for land use and livelihoods</i>																	
	<i>e. Development of training resources and training to the relevant staff to sustain and manage the database</i>																	
Output 2.1.2 Vulnerabilities and risks (current and future) assessed for the selected watersheds in 3 livelihood zones and spatial information on vulnerability available (at Disaseter Management Authority) to facilitate adaptation planning by the Government and relevant staff trained	<i>a. Assessment of existing vulnerability and risk assessments methods, tools and database and strengths and weaknesses</i>	DMA, MFLR, MAFS, LSPP																
	<i>b. Design of a comprehensive database model and spatial information systems</i>																	
	<i>c. Selection of indicators and data sources for compiling the database</i>																	
	<i>d. Analysis and implementation of spatial information products</i>																	

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
	<i>e. Development of training resources and training to the relevant staff to sustain and manage the database and information products</i>																	
Component 3: Promoting tested Sustainable Land and Water Management (SLM/W) practices to build resilience to climate risks in vulnerable sub-catchments and watersheds																		
Output 3.1.1 Adaptive land use and sustainable land and water management practices implemented in at least 24 communities in 3 livelihood zones. The crops and cropping systems will be selected based on the detailed land suitability analysis to be conducted under component 2.	<i>a. Inventory, screening, evaluation and synthesis of sustainable land and water management practices</i>	NPC, DC Conservation																
	<i>b. Stakeholder consultations and prioritization of investments</i>	NPC, DC, Conservation																
	<i>c. Detailed design of investment activities in close collaboration with the community</i>	NPC, DC, Conservation																
	<i>d. Implementation of sustainable land and water management practices</i>	NPC,DC Conservation																
	<i>a. Demonstration of adaptation benefits through field level activities</i>	NPC, DC Conservation																
3.1.2 Improved water harvesting structures at the household level implemented in 3 livelihood zones (At least 150 households possess water harvesting structures)	<i>a. Stakeholder consultation and identification of households based on the criteria</i>	NPC, DC Conservation																
	<i>b. Design of set of models for household level water harvesting structures</i>	NPC, DC Conservation																
	<i>c. Implementation of water harvesting structures</i>	NPC, DC Conservation																
	<i>d. Field level awareness raising and hands on training on maintenance of the system</i>	NPC, DC Conservation																
3.1.3 Improved vegetative cover and range resource management measures adopted in 12 communities to	<i>a. Community mobilisation for formation of grazing associations/schemes</i>	NPC, DC, Range																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
improve productive use of marginal lands .	<i>b. Support, training and guidance to user groups</i>																	
	<i>c. Range condition assessments</i>	NPC, DC, Range																
	<i>d. Development of grazing management plans</i>	NPC, DC, Range																
	<i>e. Implementation of grazing plans</i>	NPC, DC, Range																
	<i>f. Enforcement of grazing plans and protection of wetlands from grazing</i>	Grazing associations																
	Component 4: Strengthening diversified livelihood strategies and implementation of improved income generating activities at the community level																	
4.1.1 Community participation ensured in 24 community groups in selected watersheds of 3 livelihood zones and introductory sessions conducted and small-scale household level income generating activities (e.g. horticulture, small ruminants) introduced.	<i>a. Community mobilization linking to all relevant local level activities</i>	NGO, MFLR																
	<i>b. Inventory, screening, evaluation and synthesis of diversified strategies and small scale and household level income generating activities</i>	NGO, MFLR																
	<i>c. Design of suitable models of income generating activities and cost estimation</i>	MAFS																
	<i>d. Selection of beneficiaries based on the criteria and facilitation of community involvement</i>	MFLR																
	<i>e. Implementation of activities involving district and local level stakeholders</i>																	
	<i>f. Field level awareness raising and hands on training on maintenance of the system</i>	MFLR, NGO																
	<i>g. Engage communities and facilitation for selection of appropriate crop livestock</i>	NGO																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
	<i>systems</i>																	
	<i>h. Design and evaluation of appropriate models of crop livestock integration</i>	NGO																
	<i>i. Implementation of crop livestock integrated models in selected 12 communities based on the criteria</i>	MAFS																
	<i>j. Demonstration of models and awareness raising activities in parallel to implementation</i>	MFLR																
	<i>h. Hands on training to community councils and local representatives to promote village savings and loans</i>	MFLR, MAFS, NGO																
Output 4.1.2: Field demonstration of locally relevant multi-purpose agro-forestry to protect and improve livelihood systems conducted in 24 locations and adopted by the stakeholders	<i>a. Consultation with district and national level stakeholders and presentation of multi-purpose agro-forestry systems suitable for selected communities</i>	NGO, DAR (MAFS), NUL																
	<i>b. Implementation/field demonstration of windbreaks as source of fuel wood, multi-purpose fodder trees and hedges and live fences</i>	NGO, DAR, NUL																
	<i>c. Assessment of impact of the multi-purpose agro-forestry systems in-terms of income generation and livelihood asset protection</i>	DAR (MAFS)																
Component 5: Dissemination of best practices, project monitoring and evaluation																		
Output 5.1.1: A communication strategy established in close collaboration with the MOFLR, MAFS, MNR, Ministry of Local Government and Chieftainship (MLGC) and NUL and implemented	<i>a. Conduct of consultation workshops to develop a communication strategy</i>	MFLR, MAFS, MEWM, MLGC, DMA, NUL																
	<i>b. Prioritization of basic elements and</i>																	

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4												
	<i>governing/implementation principles of a communication strategy</i>																	
	<i>c. Develop a work plan for implementation of the communication strategy</i>																	
	<i>d. Develop communication materials based on the inventory, lessons learned and case studies</i>	MFLR, MAFS, MLGC, DMA																
	<i>e. Disseminate communication materials to the stakeholders in-line with the communication strategy</i>	MFLR, MAFS, MLGC, DMA																
5.2.1 Systematic collection of field based data to monitor project outcome indicators at all levels and evaluation	<i>a. Conduct a baseline socio-economic study in the three project sites</i>	PMC																
	<i>b. Collect field data to assess project impact, relevant AMAT indicators included</i>	PMC																
	<i>c. Evaluate the project at midterm to track progress on implementation</i>	FAO, MFLR																
	<i>a. e. Evaluate project achievements at end of project</i>	FAO, MFLR																

ANNEX 3: RESULTS BASED BUDGET

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
5300 Salaries professionals														
5300 Sub-total salaries professionals														
5570 International Consultants														
Land use and suitability	Week	10	3000	0	30000	0	0	0		30000	30000			
Vulnerability and risk assessment expert	Week	10	3000	0	30000	0	0	0		30000	30000			
Sub-total international Consultants				0	60000	0	0	0	0	60000	60000	0	0	0
National consultants														
National Technical Advisor (NTA)	Month	48	4200	36655	36655	54982	36655	36655		201600	50400	50400	50400	50400
District Technical Coordinators (3)	Month	144	2200	0	0	190080	126720	0		316800	79200	79200	79200	79200
Admin and operations officer	Month	48	4200	0	0	0	0	0	203360	203360	50840	50840	50840	50840
Rageland Management expert	Month	12	3000	6545	6545	9818	6545	6545		36000	18000	18000		
Livelihoods and Gender Expert	Month	12	3000	0	0	21600	14400	0		36000		18000	18000	
Climate data analysis and vulnerability and risk analysis	Month	12	3500	0	42000	0	0	0		42000	21000	21000		
Integrated Watershed Management Expert	Month	12	3500	7636	7636	11455	7636	7636		42000	21000	21000		
Policy and mainstreaming expert	Month	6	4200	25200	0	0	0	0		25200	12600	12600		
Community Mobilizers (6)	Month	144	200	0	0	17280	11520	0		28800	7200	7200	7200	7200
Driver	Month	48	1300	11345	11345	17018	11345	11345		62400	15600	15600	15600	15600
Sub-total national Consultants				87382	104182	322233	214822	62182	203360	994160	275840	293840	221240	203240
5570 Sub-total consultants				87382	164182	322233	214822	62182	203360	1054160	335840	293840	221240	203240

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
5650 Contracts														
Outcome 1: Capacity development support under component 1 (training needs assessment, curriculum development, delivery of training and manuals preparation)	Lumpsum	2	20000	40000	0	0	0	0	40000	20000		20000		
Output 2.1.1 Technical support for development of land use data base and implementation and conduct of relevant training programmes	Lumpsum	1	100000	0	100000	0	0	0	100000	50000	50000			
Output 2.2.2. Assessment of vulnerabilities and risks for three livelihood zones, conduct of the training programmes and delivery of products to the users at all levels	Lumpsum	1	40000	0	40000	0	0	0	40000	20000	20000			
Outcome 3.1: Inventory, screening, evaluation and synthesis of sustainable land and water management (SLM/W) practices and preparation of guidelines for implementation	Lumpsum	1	15000	0	0	15000	0	0	15000	15000				
Outcome 4.1: Inventory, screening, evaluation and synthesis of diversified livelihood strategies and small scale and household level income generating options	Lumpsum	1	15000	0	0	0	15000	0	15000	15000				
Output 4.1.1 & 4.1.2: Development of communication strategy and awareness products and communication at all levels	Lumpsum	1	20000	0	0	0	0	20000	20000	10000	10000			

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
Output 5.1.1: Establishment of baseline data, data collection and survey for analysis of impacts and outcomes (quantitative and qualitative assessment)	Lumps um	1	20000	0	0	0	0	20000		20000	20000			
Output 5.1.2 Medium and final evaluation (External M&E consultant/FAO Evaluation unit)	Lumps um	1	80000	0	0	0	0	80000		80000		40000		40000
Sub-total Contracts				40000	140000	15000	15000	120000	0	330000	150000	120000	20000	40000
5900 Travel														
Travel - Consultants – International	Numbers	2	10000	0	20000	0	0	0		20000	10000	10000		
Travel - Consultants – National	Lumps um	1	50000	9091	9091	13636	9091	9091		50000	12500	12500	12500	12500
Travel – Training	Lumps um	1	25000	4545	4545	6818	4545	4545		25000	12500		12500	
Travel - Non Staff	Lumps um	1	15000	2727	2727	4091	2727	2727		15000	3750	3750	3750	3750
5900 Sub-total travel				16364	36364	24545	16364	16364	0	110000	38750	26250	28750	16250
5023 Training and workshops														
M &E: Inception workshop, Annual planning workshops, Final workshop	Lumps um	5	2500	0	0	0	0	12500		12500	5000	2500	2500	2500
Output 1.1.1 National level training programme (2) on climate change adaptation and watershed management	Lumps um	2	2500	5000	0	0	0	0		5000	2500		2500	
Output 1.1.2.District level training programmes on integrated watershed management (three livelihood zones)	Lumps um	6	2500	15000	0	0	0	0		15000	7500		7500	

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
Output 1.1.3. Training on good practice examples for community representatives (24 1 day training at the community level)	Lumps um	24	1000	24000	0	0	0	0	24000	6000	6000	6000	6000	
Output 1.1.4: Training on rangeland management and decision making at the local level (3 trainings one each for each districts)	Lumps um	3	2500	7500	0	0	0	0	7500		7500			
Output 2.1.2. Training on land use data base and its use at national level	Lumps um	2	2500	0	5000	0	0	0	5000		2500		2500	
Output 2.2.2. Training on spatial information products	Lumps um	2	2500	0	5000	0	0	0	5000		2500		2500	
Output 4.1.1 Workshops at national (2), district and local (3) level conducted for formulation of communication strategy in collaboration with multiple agencies	Numb ers	5	2000	0	0	0	0	10000	10000	6000	4000			
Output 4.1.2: Development of communication materials and dissemination	Lumps um	4	6000	0	0	0	0	24000	24000	6000	6000	6000	6000	
5023 Sub-total training				51500	10000	0	0	46500	0	108000	33000	31000	24500	19500
6000 Expendable procurement														
Output 3.1.1. Implementation of sustainable land and water management practices in 24 communities	No.of Group s	24	12000	0	0	288000	0	0	288000	72000	72000	72000	72000	

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
3.1.2 Implementation of improved water harvesting structures 50 households in each district (total 150 households)	No. of house holds	150	3400	0	0	510000	0	0		510000	68000	170000	170000	102000
Output 3.1.3: Implementation of improved vegetative cover and range land management and development of rangeland management plans	No.of Groups	24	10000	0	0	240000	0	0		240000	60000	60000	60000	60000
Output 4.1.1: Implementation of small scale income generating activities (24 communities)	No.of Groups	24	9000	0	0	0	216000	0		216000	54000	54000	54000	54000
Output 4.1.2: Implementation of crop and livestock systems and training in 24 communities	No.of Groups	24	11000	0	0	0	264000	0		264000	66000	66000	66000	66000
Output 4.1.3: Establishment of multi-purpose agro-forestry systems in 24 communities	No. of groups	24	9000	0	0	0	216000	0		216000	54000	54000	54000	54000
6000 Sub-total expendable procurement				0	0	1038000	696000	0	0	1734000	374000	476000	476000	408000
6100 Non-expendable procurement				0										
Support PMU office (desk top computers, multi-media sets, projector, printer, photocopier, essential furniture)	Lumps um	1	23534	4279	4279	6418	4279	4279		23534	11767	11767		
Support District Project Unit - 3 DPUs (desk top computers, multi-media sets, projector, printer, photocopier, essential furniture)	Numb ers	3	14000	7636	7636	11455	7636	7636		42000	21000	21000		

	Unit	Number of units	Unit cost	Component					PM	Total	Year 1	Year 2	Year 3	Year 4
				1	2	3	4	5						
6100 Sub-total non-expendable procurement				11915	11915	17873	11915	11915	0	65534	32767	32767	0	0
6300 GOE budget														
Vehicle/operation/rental	Lumps um	4	30000	21818	21818	32727	21818	21818		120000	120000			
Periodical M & E reporting (inception, semi-annual, annual, co-financing and terminal reports)	Numb ers	11	1000	2000	2000	3000	2000	2000		11000	2000	3000	3000	3000
Utilities (telephone, internet, cleaner, fuel and vehicle maintenance, etc) for PMU and DPU	year	4	10000	7273	7273	10909	7273	7273		40000	10000	10000	10000	10000
Miscellaneous expenses	year	4	5000	3636	3636	5455	3636	3636		20000	5000	5000	5000	5000
6300 Sub-total GOE budget				34727	34727	52091	34727	34727		191000	137000	18000	18000	18000
TOTAL				241888	397188	1469742	988828	291688	203360	3592694	1093877	1007017	797650	694150

ANNEX 4

Background information on selected livelihood zones and communities

Three districts are selected for the project. These districts cover three major livelihood zones. In each district 8 communities were prioritized based on the multiple criteria. The lists of districts and communities are provided in Table 1. In both the southern lowland and mountain livelihood zones, the majority of the population engage with rainfed agriculture and are dependent to some degree on own production for household food supply and/or cash income. Climatic variability and thus variability of yields have direct impacts on the household cash and food situation.

Regular droughts have become a feature of the climate and are likely to remain problematic as the climate shifts to a new state. The arable southern lowlands experience some of the driest and hottest weather in the country, and heat stress in mid-summer can be expected to become an increasingly regular occurrence. In both zones, rising temperatures will lead to greater evapotranspiration rates, and more rapid soil drying between rainfall events, particularly where soils are exposed. The preservation of soil moisture between rainfall events will thus become increasingly critical.

Table 1. Communities selected for project implementation in three districts of Lesotho covering three major livelihood zones

Livelihood zones	District	Communities
Mountains	Thaba Tseka	<ol style="list-style-type: none"> 1. Linakeng 2. Ha Rajoalane 3. Seroalankhoana 4. Matlatseng 5. Ha Khatho 6. Maputsoe 7. Ha Tokho 8. Ha Shoaepane
Lowlands and Foothills	Mafeteng	<ol style="list-style-type: none"> 1. Ha Maoela 2. Ha Rankhoko 3. Boluma-Tau 4. Ha Patsa 5. Ha Moyalosa 6. Ha Mohlehli 7. Sebothoane 8. Ha Joele
Southern Lowlands across the Senqu River Valley	Quthing	<ol style="list-style-type: none"> 1. Mt Moorosi Moreneng 2. Nqanqazeni 3. Lerelleng 4. Maputsoe 5. Ha Robi 6. Ha Koali 7. Ha Moqalo 8. Lipeleng

Drought impacts on crop yields in various ways, depending to a large degree on the developmental stage of the crop. Dry spells at the beginning of the cropping season delays planting and can lead to fallowing of fields; during the flowering period (all crops) or tasselling (maize) lack of soil moisture causes poor fruit and seed set; drought during critical growth phases stunts growth and seed

development. Rangelands persistently affected by drought cannot easily produce pastures with adequate feed intake and enough nutrient content to sustain acceptable livestock production standards. Draught animals suffering from malnourishment are not strong enough for ploughing, resulting in reduced food production.

This is exacerbated when drought conditions render the soil profile harder to penetrate, forcing the animals to expend more energy per work load and consequently more feed requirement. A lack of stock management during droughts exacerbates this situation and impedes rangeland recovery. An increased frequency or intensity of hailstorms, floods and frost can destroy crops and kill livestock. The physical land degradation that comes with high intensity rains is potentially devastating, particularly under conventional agriculture where soils are disturbed (ploughed) and left exposed. The rate of leaching of nutrients through these structurally poor soils is high and manifests in stunted or nutrient deficient crops. Lack of water infiltration could lead to increased waterlogging of fields after heavy rainfall, disrupting farm operations.

Table 2. Vulnerable communities and characteristics of the zones

Livelihood zone	Vulnerable communities in the zones	Characteristics of the zone
Zone I (Southern Lowlands across the Senqu River Valley)	<ul style="list-style-type: none"> • Small livestock farmers (rear goats and sheep) • Peasant subsistence farmers (maize, sorghum and beans) • Poor households with either no ownership of field or livestock surviving on • Government and Donor Aid 	<ul style="list-style-type: none"> • Very high poverty levels • High unemployment • Low soil fertility • High soil erosion and environmental degradation • High level of desertification • Low crop production (high food insecurity) • High loss and extinction of biodiversity • Minimal arable land • Area of recurring natural disaster (Critically drought prone with high frequency of drought occurrence) • High population density • High malnutrition • High incidence of erosive thunderstorms, hail and dust-storms, • Poor vegetation cover • Low livestock holdings • Lack of infrastructure (No roads, water utilities, electricity grid & remote from town center) • Medium literacy rate • Poor accessibility to clean potable water • Poor hygiene and sanitation • Increased hunger and high mortality rate
Zone II (Mountains Region)	<ul style="list-style-type: none"> • Livestock farmers (rear cattle, goats and sheep for mohair and wool) • Crop farmers (grow maize, wheat, sorghum, 	<ul style="list-style-type: none"> • High livestock holdings • Low literacy rate • High levels of poverty • Area of recurring natural disaster (Frequent heavy snowfall occurrence)

	<p>potatoes, beans and peas)</p> <ul style="list-style-type: none"> • Labourers during peak agricultural season • Households surviving on wild vegetables • Eco-tourist guides • Small scale industry operators 	<ul style="list-style-type: none"> • Poor infrastructure • Abundant water resources • High frequency of wind storms • Early frost onset • Rugged mountainous terrain • Low crop production (food insecurity) • Inadequate arable land • High degradation of indigenous vegetation • Extreme low temperatures (cold conditions) • Abundant but deteriorating rangelands • Relatively high rainfall • Low population density • Livelihoods supported by livestock holdings
Zone III (Lowlands and Foothills)	<ul style="list-style-type: none"> • Crop farmers (grow vegetables, maize, sorghum, wheat, beans and potatoes) • Livestock farmers (rear cattle, goats and sheep) • Cash crop farmers • Dairy cattle farmers 	<ul style="list-style-type: none"> • High drought risk • High rate of soil erosion • High population density • Low soil fertility • Poor vegetation cover • Frequent hail and dust storm occurrence • Area of recurring natural disaster (Prone to floods) • Risk of water borne diseases • Relatively improved infrastructure • High literacy level • Moderate crop production although still not sufficient to meet local demand • Livelihoods dependent on cereal production and cash crops • High environmental degradation • Marginal lands

Lack of rain is frequently accompanied by increased infestations of pests and diseases, although too much moisture can have a similar effect. Crop wilting due to either high midday temperatures or fungal diseases has become an increasing problem in recent times, especially for vegetable producers, at high economic cost. Cattle are prone to tick-borne diseases and anthrax, whereas the main disease in sheep is scab. Many areas of Lesotho are normally characterized by cool growing season weather conditions and very cold winters which inhibit pests and diseases. Increasing temperatures are conducive to increased pest and disease pressure, in both crops and livestock. Most of the farmers in the three sub-catchments have inadequate access to pest and disease control in crops and livestock, with veterinary services severely under-resourced.

Following this account of potential negative impacts of extreme events and warming on agricultural production, we note that both agro-ecological zones could respond very positively to moderate increases in rainfall in a year with reasonably well distributed summer rainfall. Recent hydrological modelling results (Schulze, 2010) show a future reduction in the number of days per year experiencing soil water stress over Lesotho. Also, since Lesotho has a cool climate, the expected gradual warming could also have positive impacts on crops, livestock and people during winter.

However, the expected gradual warming may lead to negative impact on summer crops (e.g maize) especially in the foothills and lowlands.

Cold stress will be reduced, the growing season will likely be extended especially during winter, and the diversity of crops suited to the climate will increase (especially in the mountains). Some crops (e.g. legumes and root crops) grown in Lesotho could benefit from an increase in heat units which stimulate plant growth and development, particularly in spring when the greatest rise in temperature is expected. However, this will have to go hand-in-hand with sufficient soil moisture availability during the period of early rapid growth, and efficient monitoring and control of pests and diseases. Of great concern is the scenario of decreased snowfall, since snow melt currently supplies much of the required moisture in spring during the crop planting and early growth season.

Thus, on balance, increasing temperatures and heat waves will continue to have negative impacts on agriculture and food security for smallholders. Inhabitants of both zones, but particularly of the lowlands, pay close attention to the weather and rate their exposure to weather hazards as high or very high. In the mountains, human discomfort and health issues related to cold winters are currently still problematic but could be reduced under climate change.

Approximately 95 percent of households in the lowlands believe that weather patterns have changed over the last 10-20 years, compared to 82 percent in the mountains. Rising temperatures and decreasing or more unpredictable rainfall have been perceived by farmers across southern Africa, especially the older, more experienced generation. Most Basotho attribute climatic extremes and disasters to natural variability, but a significant number attribute these events to religious or cultural beliefs. Drought is regarded as the primary climatic hazard, followed by strong winds and storms. This is followed by hail and heavy rainfall in the lowlands, and heavy rainfall, frost and heavy snow in the mountains.

A consistent account of changing weather patterns in the recent past emerged from both zones: the start of the rainy season is delayed, with the first rains arriving one to two months later than expected. Lands ploughed in winter or early spring then have to be re-ploughed before planting can take place. This conventional practice of multiple tillage operations in a growing season further degrades soil quality and exacerbates the energy costs of production. Sometimes, crops which were planted in early spring have to be re-planted. Rangeland grass re-growth is delayed leading to lack of grazing and livestock starvation especially of lambs. This spring drought is followed by heavy rainstorms in early summer which cause flooding. Strong winds wreak havoc to the bare soils devoid of ground cover in the early spring.

Unseasonal cold snaps have occurred in early summer, just after the shearing season, killing small stock. Dry spells in January/ February cause yield reductions, sometimes also linked to pest outbreaks. Late planting often due to early season drought and late incidence of rains result in crops not reaching maturity, especially in the mountains where the season is much shorter due to early frost incidences which destroy crops before they can reach maturity. Based on this anecdotal (but consistent) oral evidence, it is evident that climatic hazards have been experienced regularly over the last 5-10 years, singly but also often in combination and in close succession, leading to heavy impacts on farming households from which they are finding it difficult to recover.

Rainfed agricultural systems have much higher sensitivity to climatic hazards and rainfall variability than those with some form of irrigation. A study of African crop farming under various climate change scenarios showed a positive response of irrigated crops to warming, particularly in cooler production regions. Maize is particularly sensitive to the timing and duration of dry spells; the capacity to irrigate during sensitive developmental periods can mean the difference between a normal yield and crop failure. Lesotho's agricultural sector would be considerably less vulnerable if irrigation could be developed.

It is well known amongst farmers that greater crop diversity and mixed farming (crops and livestock) offer considerable protection against farming risk, including climatic-related risk. Larger farming enterprises with a range of different crop types, or even cultivars of the same crop with differing drought or pest resistance traits, are much less likely to suffer complete crop losses.

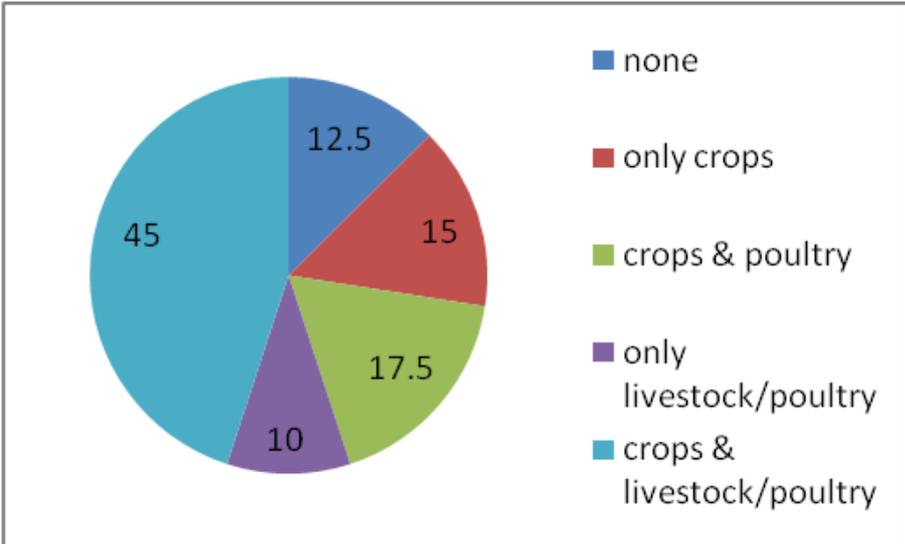
Warming trends in Lesotho could open up opportunities for new crops. A co-benefit is increased nutritional diversity, which is very low in Lesotho. Larger mixed farming enterprises are more resilient during a crisis since they are able to sell livestock for cash to buy food when crops have failed. Those who do not own livestock or own only very few animals are more sensitive to climate shocks. Even a humble poultry business, together with homestead vegetable gardening, for example, can make these households less sensitive. The keyhole garden system introduced to Lesotho by the NGO CARE and prevalent across the southern lowlands appears to be working well and is popular, with communities calling for continued support in constructing and managing these homestead gardens.

This is a good example of a low-cost adaptation practice which is also supported by local government and can be up-scaled to the national level. As over most of the subcontinent, Lesotho is arguably overly reliant on maize which, whilst it can be highly productive during good rainfall years, is notoriously sensitive to erratic and below-normal rainfall. A recent modelling study found that in southern Africa, maize and wheat are particularly sensitive and show consistently negative impacts of climate change.

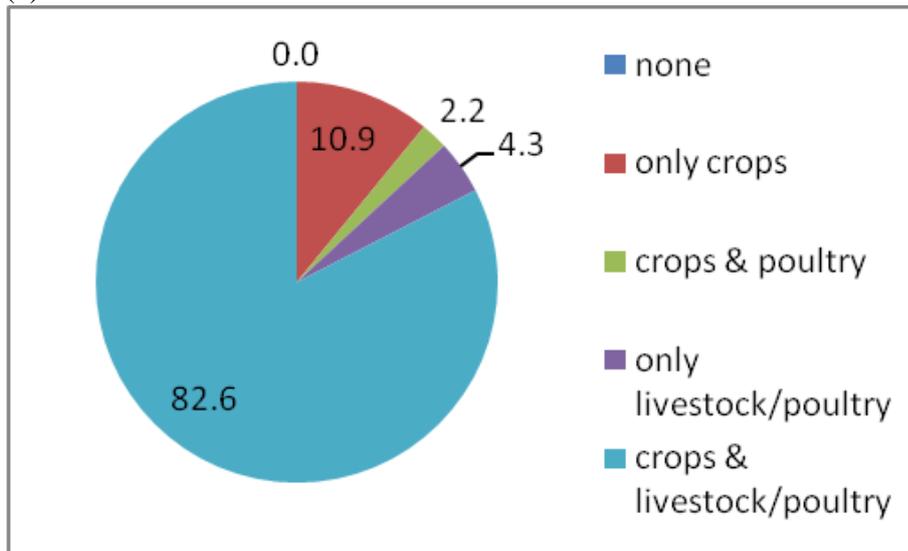
The model impacts for sorghum range widely from negative to positive, due to large uncertainties in future precipitation. The authors conclude that maize is the crop in greatest need of adaptation in southern Africa. It is likely that maize could become a “boom or bust” crop in future, with high potential yields in good rainfall years, but increasing risk of crop failure in bad years. The downside of widespread monoculture is clearly visible in the lowlands. Very few households grow beans, sorghum or peas in addition to maize. Sorghum has been mostly abandoned in the southern lowlands presumably due to the destruction caused by flocks of birds.

This trend, however, is indicative of the lack of penetration of drought and bird tolerant sorghum varieties released by the National University of Lesotho researchers in the last ten years. The pea crop is an important winter legume in the lowlands although harvest fails during droughts. In contrast, mountain farmers have a healthier mix of crops, with maize, wheat, beans and peas planted in more equal proportions. On the other hand, farmers in the lowlands are more likely to practise mixed livestock and crop farming, albeit with few animals. Nevertheless, a high proportion of households in both zones (on average 15 percent) have only crops (Fig. 1). These farmers, together with those who have no cropland, are at highest risk.

(a)



(b)



(c)

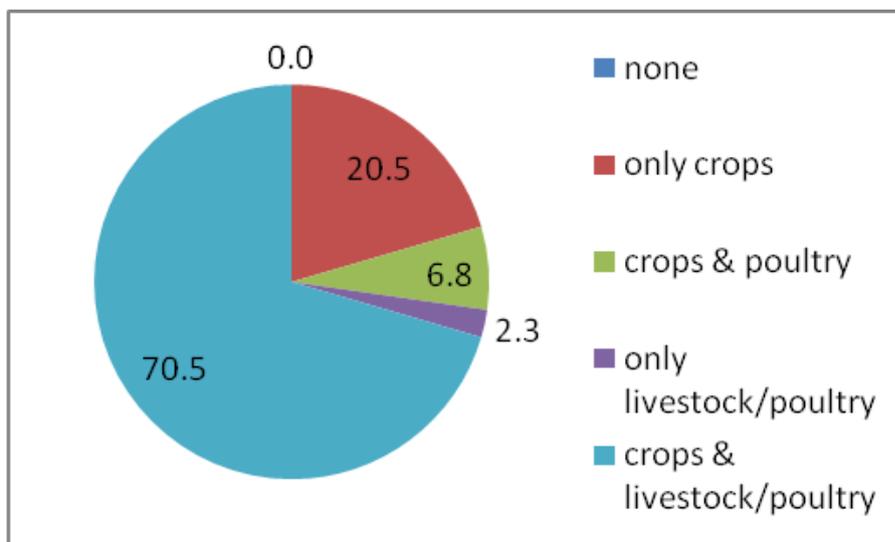
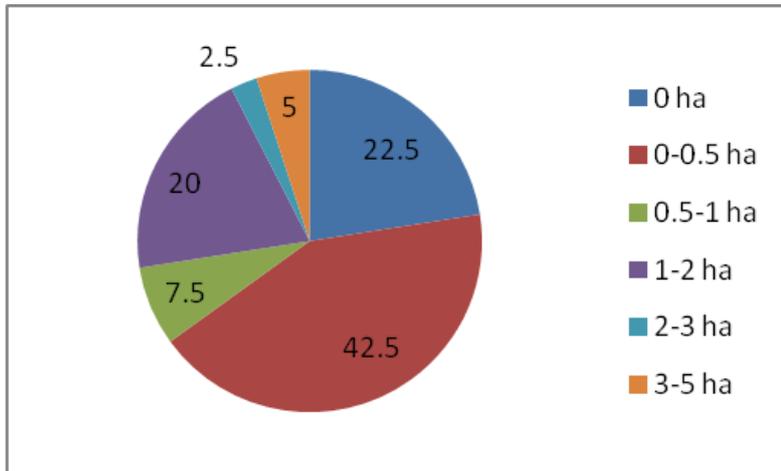


Figure 1. Households engaged in crop and/or livestock farming (% of households interviewed) for (a) Rantsimane (mountains), (b) Mabalane (south-western lowlands) and (c) Thaba Tsoeu (western lowlands/foothills).

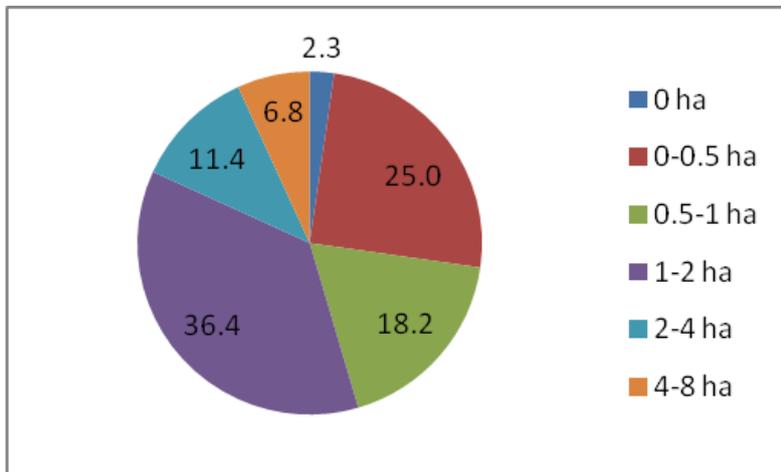
Regions with a high proportion of small farming units (subsistence and small-scale) are more sensitive than those with larger commercial units. This is because larger units have better access to implements, technologies and credit facilities, and are better able to diversify. More favourable economies of scale result in higher profitability which provides a financial buffer in years with poor production.

Land holdings are significantly smaller in the mountains than in the lowlands. In the former, 22 percent of interviewed households were landless, compared to only 2 percent in the lowlands (Fig. 2). Average land holdings per household were 0.72 ha in the mountains and 1.43 ha in the lowlands. This describes the severe lack of arable land in the mountains and may be one of the reasons explaining the low levels of fallow lands in the mountains (8 percent) compared to the lowlands (32 percent), despite drought being experienced in both zones during the reference year.

(a)



(b)



(c)

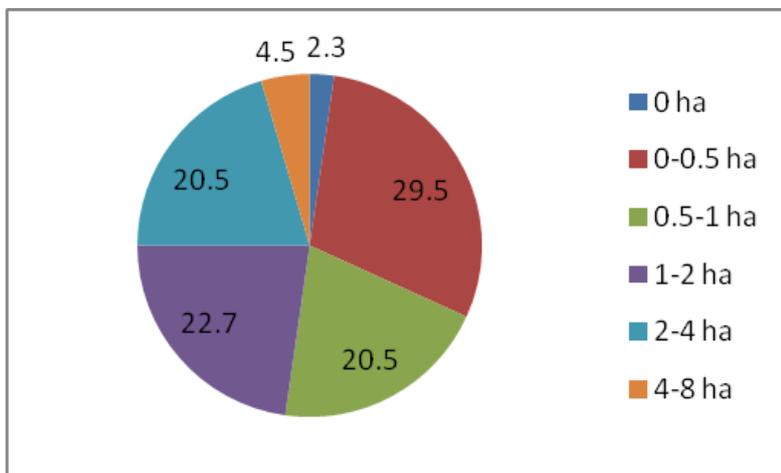
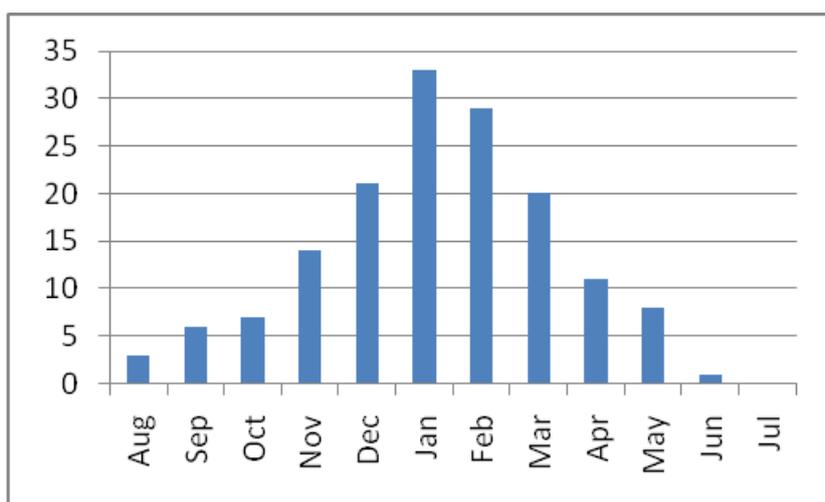


Figure 2. Land holdings (% of households interviewed) for (a) Rantsimane (mountains), (b) Mabalane (south-western lowlands) and (c) Thaba Tsoeu (western lowlands/foothills). Source: OneWorld Sustainable Investments

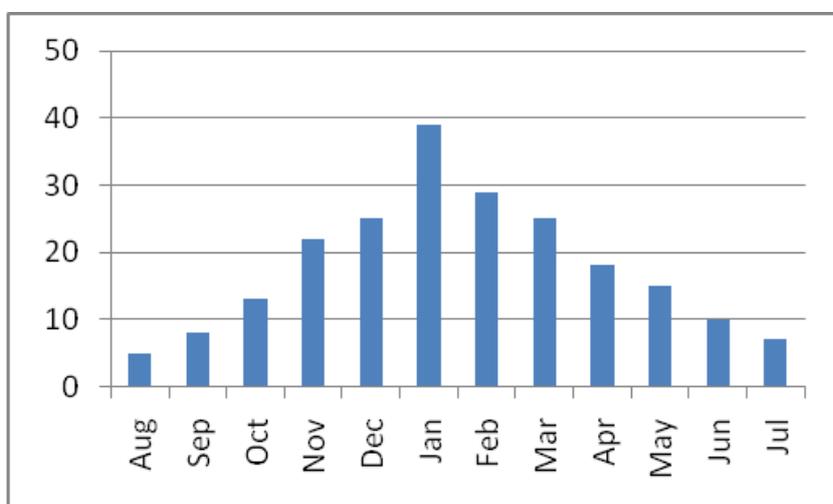
From a human perspective, household characteristics typical of each livelihood zone play a large role in determining sensitivity to climate shocks. The household dependency ratio (the ratio of children under the age of 14 plus the elderly over the age of 65 to the number of potentially economically active adults 15-65 years) in both livelihood zones is high, indicating the high demands made on economically active adults. The population density in the southern lowlands is high, so that any climatic hazard affects many people, thus adding to the region’s sensitivity and vulnerability.

Food is primarily obtained from own production, followed by purchases, in all three sites. Collection of wild foods (vegetables) is an important supplement everywhere, particularly during the “hunger season” between November and March (Fig. 3). Dietary diversity is generally low, with meals based on maize and vegetables in the majority of households. Beans are also consumed by a number of households, but consumption of milk, meat and fruit is low everywhere. Ownership of agricultural implements is skewed towards the lowlands. The plough is the major implement of primary tillage and is owned by only 40 percent of households in the mountains, compared to over 55 percent of lowland households. Lowland crop farmers are also more likely to own cultivators, planters and harrows, or a means of transport (scotch cart, wheelbarrow). Even smaller hand implements used for vegetable gardening and weeding are in short supply in the mountains.

(a)



(b)



(c)

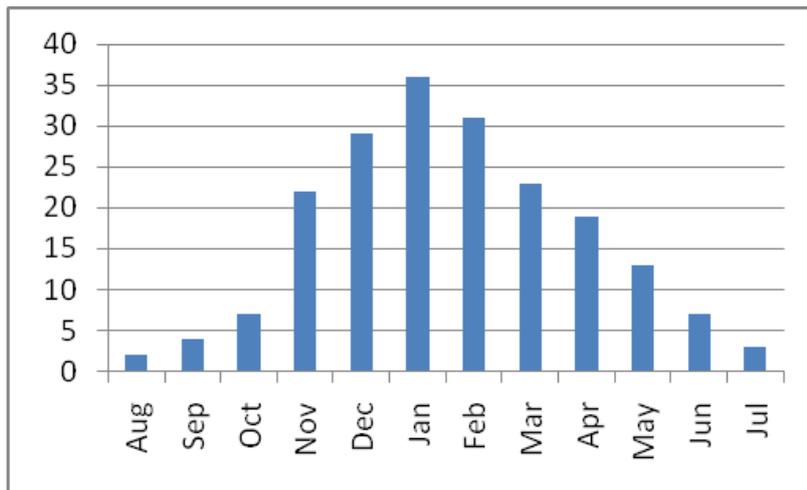


Figure 3. Seasonal calendar for the hunger season for the reference year (number of respondents identifying each month for hunger). (a) Rantsimane (mountains), (b) Mabalane (south-western lowlands) and (c) Thaba Tsoeu (western lowlands/foothills).

The overall impact of climate change on land-based livelihoods is a complex outcome of multiple stress and vulnerability. Both the southern lowlands and the mountains are highly exposed to climate variability and increases in variability brought about by climate change. They are also highly sensitive, based on serious land degradation, high reliance on rainfed agriculture (often in monoculture), low economic and agricultural diversity, the burden placed on economically active adults in caring for children, the aged and the sick, and a high rural population density in the lowlands. Thus, the impacts of climate change are expected to be severe.

ANNEX 5

List of Integrated Watershed Management Practices

1. Soil and Water Conservation

Current activities in the Ministry of Forestry and Land Reclamation are geared towards rehabilitating and reclaiming land by implementing structural and biological measures. Structural measures include:

1.1 Stone lines

The purpose of stone lines is to protect the rangelands or slopping areas and croplands in a micro-catchment by reducing the runoff speed that is a major cause of erosion. The stone lines also trap soil so that vegetation can grow.

Surveyed lines of structures constructed with loose rocks on a slope along a contour. They are made on slopes where removal of vegetation cover, mainly by grazing animals, has left the most of the soil exposed.



1.2 Diversion furrows

It is a channel with a supporting ridge on the lower side constructed across the slope. They are constructed above croplands to channel water to safe waterways hence protecting the fields from erosion due to excessive runoff.

The purpose of a diversion furrow is to divert water from areas where it is in excess, to sites where it can be used or disposed of safely. Conditions where diversion furrow applies are areas where runoff from higher lying areas is damaging cropland, pastureland, farmsteads, or conservation practices such as terraces or strip-cropping.



1.3 Silt traps

They are structures constructed from gabions, loose rocks or any material that can trap soil during runoff or during heavy rainfall. They are constructed as head structures or across the gully to trap the soil. The silt traps are useful to trap soil in gullies, so that vegetation can grow on the soil and hence stabilise the gully. The silt traps are built at the head of the gully where the gully is actively expanding due to conditions such as heavy rainfalls or soil qualities. Across the gully where the structure will be able to trap the soil from up the gully.

1.4 Terraces

- Graded terraces are constructed on slopes of 3 – 12%, and their primary purpose is to remove excess runoff water from the farmland in a way that minimizes erosion; and carry the intercepted runoff to a safe outlet at a non-erosive velocity. Fig. 3 shows a typical layout of graded terraces on farmland.
- Level terraces are constructed on slopes that are < 5% and on good permeable soils, with their primary purpose being moisture conservation within the fields in low to moderate rainfall regions.



Figure 1. An area that once cultivated at St Theresa, ThabaTseka. Soil erosion occurred due to lack conservation control measures.



Figure 2. Fields protected from soil erosion in Semonkong.

1.5 Water harvesting

Through construction of water tanks (stone built with cement), dams and ponds, in order to collect and store rainwater. This makes the water available for livestock and crop production, through conventional but most preferably drip irrigation, during times of scarcity and drought.

Use of a ram pump (right picture) that applies kinetic energy to drive itself and pump water up to a head of 20 metres is the most ideal, especially for small farmers. It does not need any external source of energy such as electricity and solar usually come with heavy unsustainable running costs.



2. Conservation agriculture

Conservation Agriculture & Climate Change Adaptation²⁴

To soften the soil and prepare a uniform seedbed for placing seed at a suitable depth to ensure uniform seed germination. This argument was true before the invention of conservation agriculture planters which can cut through the residues to place seed & ensure the uniform seed germination



²⁴Growing Nations. 2012. Conservation agriculture poster layout. Maphutseng, Mohale's Hoek.



Traditionally, farmers plough the fields for purposes of weed control and management. But in conservation agriculture, crop residues cover and live mulches suppress weed germination and early manual weeding reduces the labour requirements significantly. Herbicides technology is much cheaper than manual weed control and does a better job.

Tillage is needed to incorporate crop residue in order to speed up the rate of mineralization & nutrient cycling. Many soil amendments and their nutrients are available if they are incorporated into the root zone. Crop residues are as easily decomposed on the surface where they also serve an equally important role of protecting the soil against erosion agents. Nutrient placement studies show that surface placement of nutrients is not necessarily inferior to incorporation. Tillage gives temporary relief from compaction using implements that are able to hatter below ground compaction layers formed in the soil. This is true ... but the plough layer is caused by ploughing in the first place. No tillage no plough layer. Tillage pulverises the soil particles into fine dust and makes it more erodible. Tillage interrupts the continuity of macropores. Tillage was determined to be a critical management practice for controlling soil-borne diseases & some insects. Crop rotations are economically & environmentally more friendly management practices for disease and pest control. Agrochemicals and /or integrated pest management technologies are now available for disease & pest control practice.

To establish a crop under conventional agriculture the following cultural operation are needed: Winter ploughing, Summer ploughing, Harrowing /Disking, Planting operation, Interrow cultivation for weeding, Interrow cultivation for ridging. The list of cultural operation for conservation agriculture is much shorter and cheaper. Manual CA perations Mechanized CA: oxen or Tractor Digging basins, Planting, Hoeing (2x) and Planting Weeding: Herbicide application

The Three Principles of Conservation Agriculture

The First Principle: Minimum Tillage



Illustration # 1: Farmer using a hoe to make planting basins (sketch)

- ❑ Advantages of minimum tillage
 - Protects the soil from erosion by water and wind
 - Improves soil organic matter
 - Improves infiltration and conserves soil water
 - Improves fertilizer and manure use efficiency
 - Cost saving: fuel costs and time

The Second Principle 2 - Permanent soil cover with crop residues

- ❑ Leave approximately 30 percent of crop residues on the field



- ❑ Use the tassel as livestock fodder and /or cutting stocks 60 cm above the ground to increase amount harvested for fodder



Livestock Crop Interaction: Cut off the Tassels for livestock feed and retain the rest on the field

- ❑ The residues are cut or rolled on the field to provide mulch



The crop residue cut down and spread on the field to provide mulch

Advantages of crop residue mulch

- ✓ Protects the soil from erosion by water or wind
- ✓ Improves organic matter accumulation & carbon sequestration
- ✓ Improves recycling of nutrients
- ✓ Suppresses weed germination and growth

The Second Principle - Permanent soil cover through cover crop

- Live mulches: legume cover crops and /or legume-grass mixtures



Cover crop e.g. grazing vetch: Adjacent plots with and without cover crops

- Advantages of live mulches or cover crops
- ✓ Legume cover crops fix nitrogen and improve soil fertility
 - ✓ Protect the soil from erosion by water and /or wind
 - ✓ Provide livestock fodder
 - ✓ Suppress weed germination and growth

Demonstrating how mulches protect the soil from erosion agents



Exercise: Four mini plots are set side by side on a sloping land. Two are ploughed with a spade and one is left bare while the second is covered with crop residues. The other two are not ploughed but one is covered with residues while the other is left bare of cover. Water is sprinkled with a watering can over the plots. The runoff water is collected in a small trench on the down slope side of the mini-plots. Farmers are asked to record their observations. The observations are shared in a joint group discussion facilitated by the trainer.

The Third Principle: Crop Rotation & Intercropping



Beans planted directly into wheat residues demonstrating a cereal-legume rotation

- In principle means that different crops sequences, preferably cereal-legume, are sequentially planted on the same piece of land to provide the legume effect of nitrogen fixation.

➤ Advantages of crop rotations & intercropping

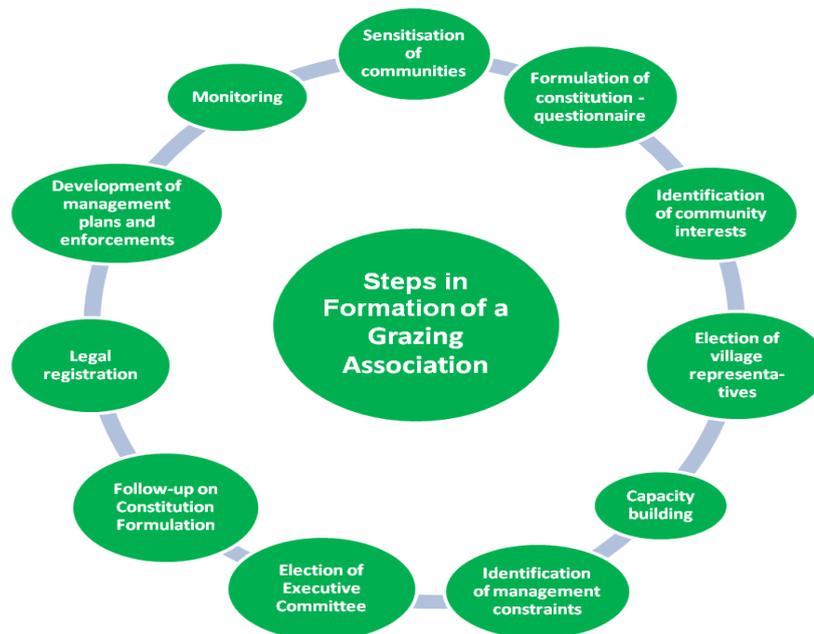
- i) **Disease and pest management:** different crops are susceptible to different disease and pest agents. Therefore, growing such crops in rotation will reduce the incidence of diseases and pests.
- ii) **Nutrient cycling & use:** Crops have different rooting patterns which take up nutrients at different soil depths. This helps to utilize soil nutrients more efficiently. In addition, legumes fix nitrogen in the soil for the benefit of successive cereal crops in a rotation.
- iii) **Soil water management:** Crops with different rooting systems also utilize soil water at different soil depths.

3. Vegetative cover and range resources management measures

- 3.1 Formation, strengthening and legal empowerment of grazing associations through community mobilisation

Procedure in Formation of Grazing Associations/Resource User Groups (Diagram below)

Types of user groups can vary from one area to another, but in general owners of livestock make the largest and most active groups of natural resource users. In this respect, these are the grazing resources. Others are fuel wood users, herbalists and handcrafters, etc.



Step 1: Sensitisation of communities

Communities in the rural may lack sufficient information on how to cope with realities of attaining a satisfactory level means of livelihood. The extension service renders enlightenment on a menu of options from which communities can make a choice. Campaigns made through public meetings are then conducted.

Step 2: Identification of community interests

With increasing pressure on the land, both rangelands and croplands, sustainable land management approach has an interest in using the resources in environment- friendly manner and most importantly seeking alternative sources of income. Public meetings are used to ascertain interest groups or individuals wishing to engage in entrepreneurial projects. The user groups also need to do the same so that selection of income generating activities can be made.

Step 3: Election of village representatives (management committee)

Over the last 30 years, experience has shown that two representatives per village be elected to form a management committee.

Step 4: Formulation of user group constitution

Extensive consultations are held to develop objectives of the user group, leading to development of its constitution. A questionnaire is administered at public meetings.

Outline of the Constitution

1. Preamble
2. Objects
3. Membership
4. Finances
5. Members' benefits
6. Administration

7. Election of office bearers
8. Termination of membership
9. Dispute resolution/Conflict management
10. Meetings of the Association
11. Amendments to the Constitution
12. Bye-laws
13. Dissolution

Step 5: Election of executive committee for user groups

While the management committee has a larger in number representatives for each village, the executive committee get elected from this group to guide the policy and business of the group. It has seven members: chairperson, vice chairperson, secretary, vice secretary, treasurer, 2 members (without portfolio).

Step 6: Empower user groups through:

Training on management skills for the executive and representatives: Managerial skills get imparted to the committees to empower them to run the affairs of the group as efficient and effectively as they will have the capacity to do.

Training on technical skills: Training modules are prepared by the various government departments to train and capacitate individual of the group, e.g. range resources management, livestock husbandry, fodder production, etc.

Study tours: A study tour is recommended, whenever possible; because it motivates the group members and becomes a good medium of information exchange especially form other successful groups to new groups.

Step 7: Identify user group management constraints

This process is, in part, as good as application of a SWOT analysis tool by members of a group. Constraints are identified to so they get tackled and remedial measures put in place to avoid pitfalls. The exercise consolidates the members' thinking and ownership of the group as they analyse their proposed management objectives.

Step 8: Follow-up on groups to engage in formation of constitutions and registration

A continuous contact between the extension staff is a prerequisite for sustained activities of an association. Experience has shown that follow-up activities during the formation and thereafter are to be maintained. Once the constitution has been agreed upon, then members take it to the Law Office to register their group as a legal entity, under Societies' Act of 1966 that can sue and be sued. A registration and annual fees are payable.

Step 9: Develop management plans and enforcements

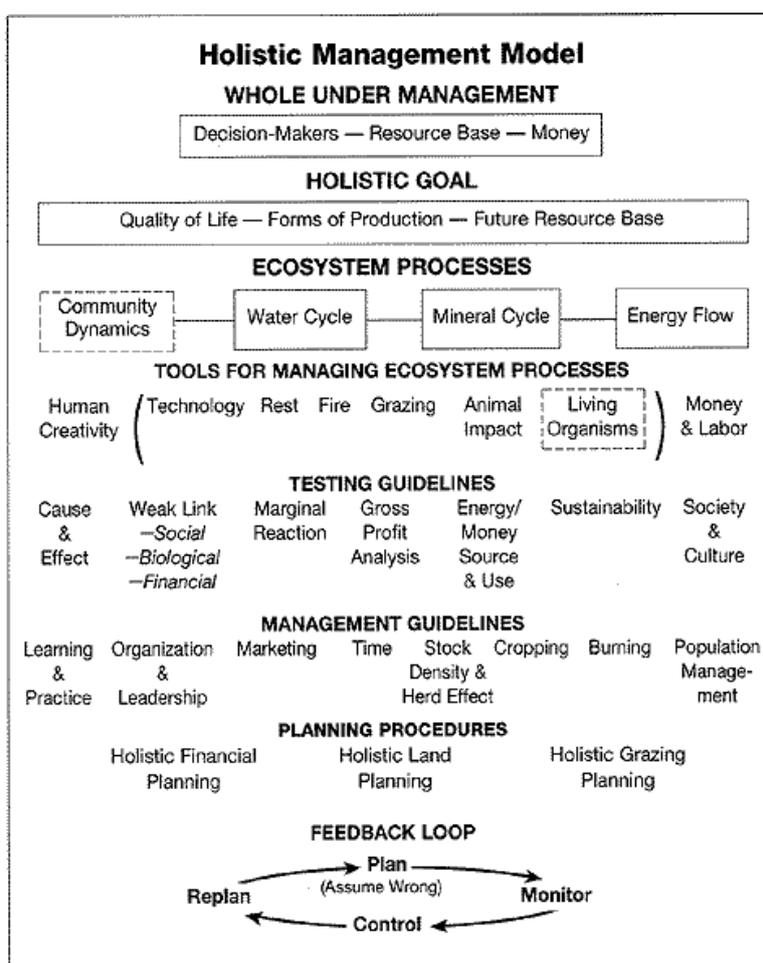
Management plans must be developed for utilisation of available resources with a designated area to be managed by a group. Rules and procedures and penalties, that must be in line with existing national laws or bye-laws of the community councils are developed, and mechanisms for enforcement put in place.

Step 10: Monitoring

Based on specified list of activities for each year members monitor progress and impacts of the activities. Identify potential areas of delays or bottlenecks. Monitoring of changes on the condition of vegetation and other environmental Resources, e.g. status of water supply, is performed by members, assisted by extension staff.

Holistic management of rangelands - a decision-making framework which results in ecologically regenerative, economically viable and socially sound management of the world's grasslands. Principles:

- Nature functions in wholes – one cannot control or change one thing in one area without having an impact on something else in another area;
- All environments are different – it is crucial to acknowledge nature's complexity and that an action can produce completely different results in different environments;
- Properly managed livestock can improve land health – when livestock is properly managed to mimic the behaviour of wild herbivores interacting with grasslands, they can reverse desertification;
- Time is more important than numbers – overgrazing of plants is directly related to the amount of time the plants are exposed to the grazing animals and the amount of time that lapses between consecutive grazing events.



Range inventory and monitoring²⁵

- Baseline assessments of rangeland condition and determination of carrying capacities;
- Establishments of permanent transects for monitoring;
- Annual assessment of vegetative condition and likely management and climatic impacts.

Protection of Wetlands

- Wetlands produce vegetation and water;

²⁵ Detailed methodology is in the "Range Operations Manual" of the Department of Range Resources Management, Ministry of Forestry and Land Reclamation.

- Protection from overgrazing by livestock through proper grazing management plans;
- Protection from road construction (see picture below);
- Conservation structures (gabions) to stop further erosion.



Wetlands that currently yield water for livestock and livelihood of the communities are under threat from over-utilisation by livestock. During dry periods, ice rats contribute to their destruction as a result foraging on the peaty (organic) soils, digging holes that get easily eroded during heavy rains. Holistic approach to management of rangelands will address the need for protection of wetlands and promotion of activities (re-vegetation, grazing management plans, and erosion control structures) that will enhance their functional ability: improved water quality, constant supply of water, control of floods, biological diversity conservation and carbon sequestration.

ANNEX 6

Existing Sources of Data and Assessments

Lesotho is divided into 10 administrative districts of Botha Bothe, Leribe, Berea, Maseru, Mafeteng, Mohale's Hoek, Quthing, Qacha's Nek, ThabaTseka and Mokhotlong. The country is further divided into four Agro-ecological zones comprising the Lowlands, Foothills, Mountains and Senqu River Valley. Furthermore the country is divided into 80 electoral constituencies which are further subdivided into 65 community councils and 10 urban councils and one city council. Most of the data for assessments are analyzed and presented by districts and agro-ecological zones. This means in most cases data for constituencies and community councils is not presented.

General Statistics: The Bureau of Statistics (BOS) under the Ministry of Development Planning used to publish Annual Statistical Bulletin (ASB) in the 1980s. The ASB was published as *Statistical Yearbook* in 1987. The Statistical Yearbook was discontinued in 1996 and was revived in 2009 as Statistical Yearbook 2010. Statistics are presented in 15 thematic chapters. When available and appropriate, the tables contain time series of up to ten years. Each chapter begins with one or two pages of comments and graphs, which are meant to highlight and explain some of the facts contained in the tables. Relevant statistics to assessment of livelihood profiles in the Yearbook include geography and climate, population, agriculture, forestry and fishing, labour market and health and medical care.

Vulnerability assessments: The Lesotho Vulnerability Assessment Committee (LVAC) under the Disaster Management Authority (DMA) has been mandated to conduct vulnerability assessments in the country. LVAC was formed in 2002 and since that time it has produced annual Vulnerability Assessment Reports. LVAC has divided the country into 7 livelihood zones based on the agro-ecological zones: Mountains, Foothills, Senqu River Valley, northern Lowlands, southern Lowlands, Urban and Peri-urban. LVAC has divided households into wealth groups based on household asset ownership, sources of food and sources of income. The wealth groups are based on household asset ownership, sources of food and sources of income. As a result most of assessment on livelihood profiles in Lesotho use poverty as a proxy for vulnerability.

Climate and weather data: The Lesotho Meteorological Services (LMS) has the responsibility of collecting and disseminating weather and climate data in Lesotho. The Lesotho Meteorological Services (LMS) produces monthly weather updates which are posted on its website. The LMS publishes the Dekadal Bulletin which shows climate data for every ten days. The LMS publishes Ten-Day Agro meteorological Bulletin. The bulletin includes monthly rainfall and temperature data by main weather stations centres where rainfall and temp. The bulletin is published every 10 days during the cropping season, i.e. from October – April. The LMS produces the seasonal forecast which is published in September and updated every month.

Population Statistics: The Bureau of Statistics (BOS) under the Ministry of Development Planning conducts the Population and Housing Census every ten years. The Population and Housing Census is presented in several volumes. These include Volume I Administrative and Methodology, Volume II Census Tables and Census Atlas, Volume IIIA is on Population Dynamics, and Volume IIIB is on Socio-economic characteristics, Census Village List, Census Post Enumeration Survey. The Demographic Survey is conducted five years after every census. The information presented in the survey include population distribution, housing characteristics and amenities, water and sanitation, fertility, infant and mortality rates, maternal mortality rates, orphan hood, economic characteristics, and internal migration and urbanization. The BOS also conducts Household Budget Survey (HBS) every 10 Years. The BOS has conducted Labour Force Surveys since 1998. Before 1985 BOS conducted Manpower and Migration Survey (MMS) which focused mainly on the characteristics of migrants, specifically mine migrants in the Republic of South Africa (RSA) in 1978/1979. The most recent Labour Force Survey was conducted in 2008.

Health Surveys: The Lesotho Demographic and Health Survey (LDHS) was conducted by the Ministry of Health and Social Welfare. The objective of the LDHS was to provide population-based information on maternal and child mortality, nutrition, fertility levels, family planning, sexually transmitted infections, HIV/AIDS and Tuberculosis. Data is presented by urban and rural residence and age structure in addition to districts and agro-ecological zones.

Agricultural Data: Lesotho has been conducting decennial agricultural census since 1949. This means Lesotho has so far conducted six agricultural censuses since in 1949 with the latest being conducted in 2009/10. The Agricultural Census is presented into several reports of which Volume I is rural households and crops statistics, Volume II is livestock and Volume V is community level tables. The variables included in the agricultural census include population characteristics, land utilization for crops and fruit trees, livestock production and livestock products, types of farm operations and inputs applied, buildings and ownership of farm equipment. The Agriculture Census is conducted by BOS. The BOS conducts the annual Agricultural Production Survey (APS) since 1973/74. The APS is made up of three surveys: survey of crops and area, survey on livestock population and meat production survey. In recent years BOS has published APS into two volumes of crops and livestock.

BOS collects, compiles and analyses data on livestock products and produces the Livestock Products Report. The report is published annually. The livestock products covered in the report include the production of milk and milk products, meat and meat products, production and imports of eggs, and wool and mohair production. The Agricultural Production Survey: Crops is also produced by BOS and is part of the Agricultural Production Survey (APS) which is published annually. This report covers information on crops grown in the country and the various operations and inputs used in their production. The information covered in the report include the total land area in which various operations like sloughing, planting, weeding, harvesting are performed as well as their quantities and total costs incurred during the process of crop production. The production and yields of maize, wheat, sorghum, beans, peas, oats and barley are presented. Area failed under each crop and reasons for failure are explained. The Livestock Report is also part of the APS which is published annually. The report provides data on animal distribution, mortality and stock change. The types of livestock covered by the report are cattle, sheep, goats, horses, donkeys, mules, pigs, chicken, dogs and cats.

The Bureau of Statistics and the Department of Planning and Policy Analysis (DPPA) of the Ministry of Agriculture and Food Security publish the Lesotho Agricultural Situation Report annually. The report presents agricultural statistics data for the last 10 years (from the year of publication). The report also presents the data by agro-ecological zones and districts. The data included in the report include National Accounts (GDP by activity) and rainfall statistics. The data presented include crop production, planted area, yields for the major crops of maize, sorghum, wheat, beans and peas. The livestock data include numbers of cattle, sheep, goats, horses and donkeys. The livestock data also include stock mortalities and births. Quantities and values of wool and mohair exported from Lesotho are presented. The report also includes quantities and values of fruit and vegetables imports into Lesotho.

Every year in April the Bureau of Statistics in collaboration with National Early Warning Unit (NEWU) under Disaster Management Authority (DMA) and the Ministry of Agriculture and Food Security conducts Crop Forecasting Survey. The main purpose of the forecasting is to inform the planners and policy makers about the expected crop production in order to make effective decisions concerning availability of food in the country and to make necessary preparations if there is shortage of food. The report presents on area planted, yields and total production of maize, sorghum and wheat. The data is presented by districts and agro-ecological zones. Times series data for the last five years is also presented. In addition data on rainfall as well as availability, utilization and consumption of maize, sorghum and wheat are presented.

The Agricultural Information Services Division of MAFS publishes a quarterly bulletin entitled “*Mobu ke Letlotlo*” (The soil is a treasure) and sometimes includes prices of agricultural commodities. However, it seems the bulletin circulation is limited to the ministry’s departments and divisions. The

Department of Livestock Services collects data on livestock imports and exports. The Lesotho National Dairy Board collects comprehensive statistics on the milk industry of the country. The Dairy Board collects statistics on milk producer prices, retail prices of fresh milk and milk products, and animal feed prices. The Board produces a quarterly marketing report which seems to have limited circulation.

The Department of Marketing of the Ministry of Trade, Industry, Co-operatives and Co-operatives (MTICM) is responsible for collecting and disseminating agricultural product prices. The Department was formerly part of the DPPA of MAFS but was transferred to MTICM. The Department of Marketing while under MAFS used to collect agricultural commodity prices. The Statistics Section of the Department of Marketing collects and analyzes wholesale and retail prices of the following agricultural commodities: vegetables, eggs, milk, livestock, and bread. In addition the section collects wool and mohair prices. The Department of Marketing produces weekly wholesale prices of fruits and vegetables and livestock. It also produces monthly reports of agricultural commodity prices. The monthly reports are not published but are circulated within the Department. The Department used to publish a quarterly newsletter but this was discontinued as it was believed the published prices were stale by the time of publication.

Environment and Energy statistics: The BOS first published Environmental and Energy Statistics in 2013. The intention is to publish environmental and energy statistics every year. This publication includes statistics on energy, land use, air and climate change, water, waste, and biodiversity.

Biodiversity, Land Use and Cover: This report was first published by BOS in 2013 and includes secondary data collected from several government departments. The data presented cover the period 2008-2013. The data presented include land use statistics (agricultural land, forests and wooded land, and built-up and related land), biodiversity statistics (threatened species, conserved catchment areas, and wetlands).

Poverty Assessments: The BOS launched the Continuous Multi-Purpose Household Survey in 2009. The survey is conducted every quarter i.e. after every three months which means four reports are produced annually. The survey presents data on household characteristics such as age, sex and marital status, economic activity of household members, and household consumption expenditure. The data is presented by district and rural and urban categories. The Core Welfare Indicators Questionnaire (CWIQ) Survey has been developed by the World Bank in order to provide Policy Makers with household level information for policy formulation. BOS conducted CWIQ survey in 2002 which was the first of its kind in Lesotho. The CWIQ was intended to monitor poverty levels and the effects of development policies, programs and projects on living standards. The survey covers household characteristics, poverty, education, health and nutrition, HIV/AIDS, employment, household assets and facilities and housing and amenities. The data is presented by districts, urban and rural categories.

The World Bank conducted an assessment of poverty in Lesotho in 1995. The objective of the study was to assess the nature and prevalence of poverty in Lesotho as well as distribution by region, income sources and household composition. The World Bank used data from the Bureau of Statistics 1986/87 Household Budget Survey and the 1993 Sechaba Consultants survey. Chapter 2 of the report profiles the extent, severity, and effects of poverty in Lesotho. The poverty profile analyzes the economic activities, expenditure patterns, nutrition status and assets of poor households. The chapter also assesses the degree to which households are covered by and use basic social services and identifies the main obstacles the poor encounter in the efforts to improve their welfare. The report covers poverty distribution by main source of income, geographic distribution of income (rural vs urban, agro-ecological zones, and districts).

The National Human Development Report 2006: The Challenges of HIV and AIDS, Poverty and Food Insecurity is published by the United Nations Development Programme (UNDP) in Lesotho discusses the state of human development in Lesotho. The data used in the report is based on the Bureau of Statistics 1986/87, 1994/95 and 2002/03 Household Budget Surveys. The report covers

poverty trends between 1994/95 and 2002/03, geographic distribution of poverty, food insecurity, HIV/AIDS, access to basic needs, etc. Data is presented by districts, agro-ecological zones

Several institutions are involved in collecting data and information that can be utilized to assess vulnerabilities and impacts. Since climate change is a recent phenomenon most institutions are not aware of climate change and hence do not have adaptation plans. Currently most of information gathered is not translated appropriately to key stakeholders. This results in people not utilizing the relevant data which may impact their livelihoods and health. Most of the data and information is collected at the central level but is not passed on the districts and local level where it is most needed. However, several initiatives are currently in place to address the problem of poor information management system in the country. The following are some of the short comings which impact on access of information:

- Accessibility -Some of the data produced in Lesotho is easily accessible while some is not easily accessible. Most of the data produced by the BOS is easily accessible through its website and can be downloaded. The BOS also has a library where its reports can be accessed and purchased. However, data from other institutions is not easily accessible. This means it is difficult for end users to access the data.
- Obsolete equipment- A recent audit of the climate station observation network in Lesotho supported by the World Meteorological Organization (WMO) and the UNFCCC concluded that its network faced many challenges including obsolete and unserviceable equipment, human errors at monitoring stations, vandalism, and poor communication facilities
- Insufficient financial resources – insufficient financial resources have resulted in some data not being collected
- Reliable historical data- LMS climate data goes back to the 1970s and was collected from few weather stations. This data is not yet digitized and is available in hard source format. In some instances the data is provided by LMS only on demand.
- Quality – Various agencies are involved in the collection of statistics and do not use same definitions.
- Timeliness of data – In most cases there are long delays between data collection and dissemination. There are cases whereby statistics are published some 2-3 years after being collected.
- Non-publication of statistics – Some public agencies and NGOs collect statistics regularly but do not publish their statistics but make them available as print-outs on requests. One cause of this problem is that these agencies have the personnel to collect the data but do not have the personnel to analyze and interpret the data.
- Lack of coordination – Several agencies are involved in collecting the same data which results in duplication of efforts. An example can be made of BOS and Department of Marketing who collect agricultural commodity prices.
- Regularity – Although the BOS and some government agencies collect data on regular basis there are instances where the data is not collected regularly because of lack of resources. This results in gaps in data collected.
- Capacity – In some instances data is collected but not analyzed due to insufficient human capacity and lack of equipment.
- Availability of data to end-users - Lesotho has a decentralised administration system with districts, community councils, agricultural resource centres and sub centres. Community councillors, Extensions officers are not in position to assist the communities they serve because they have not been provide information on climate change
- Most data is not presented by Constituencies and community councils
- Access to information- Most of the districts offices (MFLR, MAFS, and DMA) has no computers and as such cannot access and store data as well having limited access to the internet. This means the districts' staff is not in position to make use of the available data or pass it on to farmers. Some of the data is not presented in a user friendly manner so that farmers can easily understand it.

- Reliability of websites -Some of the data cannot be accessed because websites are currently not being updated as a result of lack of funds.
- Lack of feedback mechanism - LMS does not have a feedback mechanism by which primary beneficiaries could inform the packaging and targeting of appropriate forecasting.

There is evidence that Lesotho is facing climate change and information must be packaged to stakeholders in an appropriate manner for them to adapt to climate change. Currently, several institutions are collecting data that can be used to assess vulnerabilities and impacts. However, currently most of the existing and available information is not utilized for vulnerability assessment and how they can be used in sustainable land and water management practices at watershed scale and diversified livelihood strategies.

It is proposed that the MFLR established a management information system that will be utilized for vulnerability assessment. It is proposed that the management information system be housed in the Project Implementation Unit (PIU) to be established under the project. The information management system be manned by one Data Management Officer. Four desktop computers, one for PIU, and 3 for the 3 districts where the projects sites are located. There should be internet connection to the 3 districts. At the districts level the computers will be housed within MFLR offices and will be used by Project Officers to be recruited. At the district level Project Officers will share information with staff from MFLR, MAFS, MLGC, DMA, NGOs and other stakeholders.

ANNEX 7

Terms of Reference (TOR) for national and international experts

National Project Coordinator (NPC) (Appointed by the Government and no cost to the project)

Under the supervision of the Ministry of Forestry and Land Reclamation (MFLR), and in close coordination with the FAOR office in Maseru, Lesotho and FAO headquarters, the National Project Coordinator (NPC) will be responsible for the overall execution of the project. He/she will ensure adequate collaboration between the project team and all selected district offices; as well as other government agencies at national, district and local levels and other partners thus ensuring smooth and effective project implementation. He/she will be responsible for the organizational and logistical arrangements and the mobilizing and coordinating the technical support services required from national level for the effective implementation of all aspects of the project. He/she will be responsible for the overall reporting *vis-à-vis* the MFLR and FAO. In particular, he/she will:

- Be responsible for overall management and implementation of the project activities
- participate in the preparation of the detailed work plan for the project;
- assist in identifying candidates for the national consultancy;
- supervise and advise on the implementation of the field activities;
- provide overall technical guidance to the design and implementation of the national, district and local level training and capacity building process;
- ensure intensive and regular networking and transparent collaboration with other government line agencies at national, district and local levels as well as with other partner agencies and subcontractors;
- act as a member secretary to the Project Steering Committee (PST) and liaise with other members of the steering committee for inter-ministerial and departmental collaboration and for effective delivery of project outputs and outcomes.
- ensure project representation and contribute to relevant meetings/consultation related to climate change adaptation in agriculture sector.

Qualifications: longstanding field experience at local and national level with planning, implementation and monitoring of sustainable agricultural development and/or natural resource management and/or climate change adaptation activities.

Duty Station: Maseru and need based travel to selected districts.

Duration: entire period of the project.

National Technical Advisor (NTA)

Under the overall supervision of the National Project Coordinator (NPC) and the FAOR and the technical supervision of the Lead Technical Office (LTO)/ Lead Technical Unit (LTU), and in close collaboration with the relevant agencies of the Ministry of Forestry and Land Reclamation (MFLR) and other project partners, the national expert will conduct the following major tasks at national and local levels;

- provide overall implementation support to the National Project Coordinator (NPC) and provide technical coordination support for smooth implementation of the project.
- assist NPC in organizing project meetings, workshops and training programmes at national, district and local levels;
- facilitate the work of the national and international experts, project partners, subcontractors in carrying out their situation assessment, training need assessment, documentation of climate change adaptation practices;

- assist the Project Steering Committee members through the NPC in preparation of relevant documents and organization of periodical steering committee meetings
- conduct a series of brainstorming sessions with a range of key stakeholders to discuss the future role and the comparative advantage of MOFLR in Climate Change Adaptation and collect the expectations from other agencies *vis à vis* the role of MOFLR in CCA at national and local level;
- analyse the institutional aspects and policy requirements to better link the agriculture sector into Climate change policies and plans in Lesotho and monitor mainstreaming of CC priorities into relevant policies and plans;
- building on the lesson learned from project implementation process and pilot interventions in selected districts, facilitate a discussion process within MOFLR at all levels to better integrate agricultural perspectives.
- assess institutional and policy requirements to better link the current and longer term climate change adaptation at district and local levels;
- prepare a field demonstration plan at the beginning of each season and assist the NPC in organizing the demonstrations through subcontracted organizations and district technical coordinators;
- assist the NPC in organizing workshops, training programmes, study tours and exchange visits;
- participate in the project wide workshops and training programmes organized by MOAD in association with the subcontracted organizations;
- assist the subcontracted organizations in setting up of climate information networks within MOFLR and at the district levels;
- assist district level officers and community mobilizers in preparing the community level range management plans and to implement the priorities.
- Assist NPC and FAO to prepare periodical reports (workshop reports, inception, mid-term and evaluation and monitoring reports)
- submit a substantive technical report at the end of the assignment
- any other duty required to support a successful implementation of the project.

Qualifications: advanced degree in agriculture and related subjects together with long standing field experience at local and national level on planning, implementation and monitoring of climate change adaptation programmes in Lesotho.

Duty Station: Maseru, Lesotho and need based travel to pilot districts.

Duration: 48 months

National Experts

District Technical Coordinators (3)

Under the overall supervision and guidance of the National Project Coordinator (NPC), the FAOR and the technical guidance of relevant technical units in FAO and in close collaboration with Project Management Unit (PMU) and District Project Unit (DPU), FAO technical backstopping officers and other project staff and partner agencies, the district technical coordinators will perform the following tasks:

- collect relevant primary and secondary data from the district and community councils as and when required;
- support District Project Unit (DPU) to implement the project in respective districts and communities;
- assist in organizing and conducting orientation workshops/meetings in each community to explain the project objectives and activities;
- initiate awareness creation process on climate change adaptation and support the project implementation team in awareness raising efforts at district and community levels;

- identify local partners/farmers groups/farmer field school/ individual households, including women and women's groups, potentially interest to collaborate in the pilot demonstrations;
- promote and facilitate discussion between farmers, farmer groups and district task groups about selection of locally preferred/ acceptable climate change adaptation options for pilot testing;
- assist in organizing field demonstrations at field level to test and familiarize viable adaptation practices;
- assist to implement and monitor the field demonstrations and collect periodical data for comparison and impact assessments;
- assist the district level officers in preparing easily understandable extension tools and methods for familiarising "good practice" examples;
- assist in organizing district and community level workshops, participatory discussions, brain storming sessions and training programmes;
- facilitate broader replication of successfully tested adaptation practices and technology options within the farming communities;
- liaise with the project team at the national level and district level implementation task groups on day to day activities and provide feedback to all necessary project partners, consultants and other project staff.

Qualifications: Basic/Undergraduate degree in agriculture and/or related subjects together with field/on-farm experience on planning, implementation and monitoring of field demonstrations, disaster preparedness and climate change adaptation programmes/activities. Master's degree with experience of conducting of field trials/demonstrations is preferable.

Duty Station: Selected 3 districts of the project in Lesotho and need based travel to communities and to Maseru.

Duration: 48 months

National Expert

Integrated Watershed Management Expert

Under the overall supervision of the FAO Representative in Lesotho and in close collaboration with the Ministry of Forestry and Land Reclamation, the national project focal point, FAO technical backstopping officers and other project staff, the national expert in integrated watershed management will perform the following tasks:

- assist the national project focal point in coordinating the project activities including workshops, training programmes, stakeholder meetings in cooperation with the key stakeholder Ministries at national level and the Project Implementation Committee (PIC) representing the key line Ministries coordinating and implementing officers at each of the three pilot districts;
- participate in the selection process of the national experts (see Annexes 5 to 9) and local facilitators to work with local community and farmers;
- coordinate and supervise the design and conduct of the baseline studies in the project area with a view to an integrated approach to the implementation and monitoring of project impacts;
- produce a consolidated inception report from all three pilot sites;
- coordinate the overall planning and carrying out of a monitoring of the programme including the mid-term and terminal report;
- coordinate the organization of the inception, mid-term and wrap-up workshops in close collaboration with all the relevant stakeholders and prepare a report on the findings;
- guide the production of report on the socio-economic, policy and regulatory barriers and technical capacity of key institutions in climate change adaptation;
- guide the preparation and implementation of all relevant training programmes;
- coordinate closely with the national project focal point and FAO/Lesotho and ensure the production of the key deliverables indicated for each output and provide a consolidated

technical report on experiences, lessons learned and recommended strategies for climate change adaptation based on the results and impacts of the project including up-scaling strategies for identified adaptation strategies.

Qualifications: Advanced degree in agriculture and related subjects with field experience in planning, implementation and monitoring of climate change adaptation programmes. The incumbent should be a senior scientist with a minimum of ten years of experience and basic training in agronomy specialized in one or more of the following areas: crop agronomy, soil and water management, conservation agriculture and watershed management. The incumbent must be an experienced trainer with considerable knowledge on impacts of climate impacts on Lesotho. Experience in community development and project management will be an added advantage. Fluency in spoken and written Sesotho and English and excellent computing skills are necessary.

Duty Station: Maseru, Lesotho and as needed travel to pilot districts and watersheds.

Duration: 12 months

National Expert

Livelihoods Development and Gender

Under the overall supervision of the National Project Coordinator (NPC), the FAOR and the technical supervision of the relevant technical units in FAO, and in close collaboration with the Ministry of Forestry and Land Reclamation (MFLR) and other partners, the national expert on livelihood development will carry out the following tasks:

- in-depth assessment of the physical/environmental parameters influencing or influenced by the local hazard context, and conditions for agricultural production;
- livelihood profiling using existing methodologies to characterize:
 - the livelihood groups most vulnerable to climate risks;
 - their capacity and coping strategies;
 - their existing agricultural practices (crops, livestock, fisheries, and homestead, etc.);
 - their access to the natural resource base, agricultural inputs, services and other assets;
- local institutional assessment; their role, capacities and strengths weaknesses, needs (including training needs) and gaps in the context of climate change adaptation in agriculture; capacities of local institutions to implement coping and adaptation strategies against climate risks, giving special consideration to assessing the role of women, the elderly and children; local perceptions and ideas about the role, capacities and needs (including training needs) of farmer associations.
- development and prioritization most suitable and location specific livelihood strategies and income generating activities relevant to different livelihood groups including women and most vulnerable groups;
- review and assess from a gender perspective relevant materials related to gender, natural resource management and lessons learned from past and ongoing development and research projects in Lesotho related to climate change adaptation;
- with technical support from the ESW officer, provide technical and methodological advice for inclusion of gender issues in project baseline and monitoring and evaluation activities, paying particular attention to the livelihood profiling and local perceptions components of the project baseline studies;
- provide technical advice and support to the district technical team and community level mobilizers to properly identify and prioritize suitable livelihood options
- provide technical support for implementation of livelihood options and income generating activities at the community level

- Support the national expert on rangeland management, who will develop an integrated approach for the improvement of vegetative cover and range resources management measures by providing gender-sensitive considerations.
- at the conclusion of the consultancy, prepare a report covering livelihood development and gender

Qualification: Higher degree in social sciences and with sufficient background/experience in livelihood development and gender related aspects. Experience in working with farmers and extension workers to manage climate risks is preferred.

Duty Station: Maseru, Lesotho and need based travel to pilot districts.

Duration: 12 months

National Expert

Climate data analysis and vulnerability and risk analysis

Under the overall supervision of the National Project Coordinator (NPC) and the FAOR and the technical supervision of the relevant units in FAO, and in close collaboration with the Lesotho Meteorological Services (LMS), the Ministry of Forestry and Land Reclamation (MFLR) and Disaster Management Authority (DMA) and other project partners, the expert will conduct the following major tasks at national and local levels;

- provide technical advise on climate data collection, analysis and synthesis of climate change scenarios to be used for land use scenario analysis
- contribute to improvement of databases, tools and methods for vulnerability and risk assessment
- conduct basic assessment for designing a comprehensive risk and vulnerability data base for selected watersheds in close collaboration with the international expert and also the contractor to be hired for technical support on assessment
- provide technical support for organizing relevant training on risk and vulnerability assessment
- contribute to strengthening of the current database management systems in the Ministry of Forestry and Land Reclamation (MFLR) and Ministry of Agriculture and Food Security (MAFS)
- provide technical advise to implement tools and methods for assessment of vulnerability and impacts

Qualifications: advanced degree in meteorology/agro-meteorology or in biological sciences with significant work experience in agricultural meteorology.

Duty Station: Maseru, Lesotho and need based travel to districts.

Duration: 18 Months

National Expert

Rangeland Management

Under the overall supervision of the FAO Representative in Lesotho and the technical supervision of the LTO/LTU and in close collaboration with the Ministry of Forestry and Land Reclamation (MFLR) and the Ministry of Agriculture and Food Security (MAFS), the national project focal point, FAO technical backstopping officers and other project staff, the national expert in rangeland management will perform the following tasks:

- review experience gained in Lesotho (possibly any other similar environment in Southern Africa) on the rangeland management and synergy involved in crop-livestock interaction to enhance productivity and reduce vulnerability to drought and other climate related risks;
- prepare inventory of rangeland management techniques and crop-livestock management techniques (relevant to dryland and mountain ecosystems in the pilot districts) that show the most promise in improving both productivity and environmental benefits (i.e. ecosystem resilience, increased biomass cover) and takes into account vulnerabilities related to climate change and drought;
- identify gaps in the technical skills and knowledge of farmers and extension experts in rangeland management and crop-livestock interaction and guide the Project Implementation;
- provide technical input and serve as a resources person at the national and district level workshops and in the training of local facilitators;

Qualifications: Advanced degree in agriculture with emphasis on rangeland management and livestock management, feed and rangeland management. He/she would provide key technical support for crop specific programme issues at the pilot site. Fluent written and spoken English and Sesotho languages and excellent computer skills are essential.

Duty Station: Maseru, Lesotho

Duration: 12 months

National Expert

Policy and Mainstreaming

Under the overall supervision of the National Project Coordinator (NPC) and the FAOR and the technical supervision of the relevant units in FAO, and in close collaboration with the Ministry of Forestry and Land Reclamation (MFLR) and other project partners, the contractor will conduct the following major tasks at national and local levels;

- conduct a series of brainstorming sessions with a range of key stakeholders to discuss the future role and the comparative advantage of MOFLR and MOAFS in climate change adaptation
- analyse the institutional aspects and policy requirements to better link the agriculture sector into new climate change policy and strategy in Lesotho
- assess institutional and policy requirements to better link the current and longer term climate risk management activities at district and local levels;
- participate in all national level policy development activities related to agricultural sector and analysis the possibilities for mainstreaming climate change concerns into agriculture and food security policies and plans
- assist NPC in organizing consultation meetings at the national level to identify needs for mainstreaming
- assist to analyse the policies, plans and strategies of agriculture sector and assess the level of integration of climate change concerns into those documents
- assist to analyse the climate change policies, plans and strategies and identify the level of integration of agriculture and food security aspects into the climate change policies
- submit a substantive technical report at the end of the mission;
- any other duty required to support a successful implementation of the project.

Qualifications: advanced degree in agriculture and related subjects together with long standing field experience at local and national level on planning, implementation and monitoring of climate change adaptation programmes in Lesotho. Experience in institutional assessment and mainstreaming is an advantage.

Duty Station: Maseru, Lesotho and need based travel to pilot districts.

Duration: 6 months.

International Expert

Land Use and Suitability

Under the overall supervision of the National Project Coordinator (NPC) and the FAOR and the technical supervision of the relevant units in FAO, and in close collaboration with the Ministry of Forestry and Land Reclamation (MFLR) and Ministry of Agriculture and Food Security (MAFS), the expert will conduct the following major tasks at national and local levels;

- provide technical advise on improvement of databases, tools and methods for assessment of land use and land suitability
- conduct basic assessment for designing a comprehensive land use and land suitability data base linking with livelihood strategies of local communities
- provide technical support for organizing relevant training on livelihood and land use data base
- contribute to strengthening of the current database management systems in the Ministry of Forestry and Land Reclamation (MFLR) and Ministry of Agriculture and Food Security (MAFS)
- provide technical advise to implement tools and methods for assessment of land use and land suitability
- work closely with the contractor to be hired through LOA for development of land usedata base and implementation

Qualifications: advanced degree in meteorology/agro-meteorology or in biological sciences with significant work experience in agricultural meteorology.

Duty Station: Maseru, Lesotho and need based travel to districts.

Duration: 10 weeks

International Expert

Vulnerability and risk assessment expert

Under the overall supervision of the National Project Coordinator (NPC) and the FAOR and the technical supervision of the relevant units in FAO, and in close collaboration with the Lesotho Meteorological Services (LMS), the Ministry of Forestry and Land Reclamation (MFLR) and Disaster Management Authority (DMA) and other project partners, the contractor will conduct the following major tasks at national and local levels;

- provide technical advice on improvement of databases, tools and methods for vulnerability and risk assessment and to define the hotspots of vulnerability
- conduct basic assessment for designing a comprehensive risk and vulnerability data base for selected watersheds
- provide technical support for organizing relevant training on risk and vulnerability assessment
- contribute to strengthening of the current database management systems in the Ministry of Forestry and Land Reclamation (MFLR) and Ministry of Agriculture and Food Security (MAFS)
- provide technical advise to implement tools and methods for assessment of vulnerability and impacts
- work closely with the contractor to be hired through LOA for assessment of vulnerabilities and risks for three livelihood zones

Qualifications: advanced degree in meteorology/agro-meteorology or in biological sciences with significant work experience in agricultural meteorology.

Duty Station: Maseru, Lesotho and need based travel to districts.

Duration: 10 weeks