

66

**ENVIRONMENTAL DEGRADATION IN LESOTHO:
A RETROSPECTIVE ANALYSIS OF THE THABA
BOSIU RURAL DEVELOPMENT PROJECT**

A Practicum submitted to the Faculty of Graduate Studies of the University of
Manitoba in partial Fulfilment of the requirements for the degree of
Masters of Natural Resources Management

by

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For my parents, wife and daughter

ABSTRACT

Lesotho is a small mountainous country in southern Africa heavily stressed by environmental degradation. The majority of the population are dependent on subsistence agriculture and hence are directly affected by the all pervasive environmental degradation problem in the country. In its attempt to arrest the problem, the government in Lesotho implemented several agricultural development projects, among them, the Thaba Bosiu Project which is a case study in this practicum.

The Thaba Bosiu Project had principally two objectives: 1) to curb the unprecedented environmental degradation problem in the area by building graded terraces, grassed waterway channels and gabion structures in the *dongas*. In addition the Project sought to establish vegetation cover in the area by planting trees. 2) to demonstrate to the farmers "new and improved" farming methods in order to increase income derived from farming.

The objectives of this study were hence to investigate the causes of this unprecedented environmental degradation problem in Lesotho from the rural peoples' perspective and to analyse the extent to which the Thaba Bosiu Project mitigated them. This was achieved by conducting interviews in the area during the months of June to August 1994.

The results of these interviews indicate that the second objective of the Project was not met at all. Instead the Project embarked on an ambitious agronomic research the findings of which were not even disseminated to the farmers. The first objective was met insofar as building mechanical structures is concerned. However, there were no long term sustainability mechanisms put in place.

With respect to the causes of environmental degradation, the study found that they are not limited to the activities of the rural people as is usually believed, but extend into public policy, institutional flaws, poverty, land tenure system and rapid population growth. Analysis of results of the study revealed that the existence of extensive environmental degradation in Lesotho is a symptom of these broader systemic maladies. Therefore, looking at the Thaba Bosiu Project in retrospect reveals why its conservation activities were not sustainable. They were just focused on the tip of an iceberg without addressing the real issues causing environmental degradation in the country.

Based on these findings, several recommendations were made, among them, the necessity for Lesotho to implement sustainable development with principally four elements 1) empowerment of local communities; 2) participation and accountability; 3) partnerships between and among communities, and with the government; 4) livelihood security in order to protect future use. Equally important is the recommendation that Lesotho needs to enact an "Environment Act" and/or a "Sustainable Development Act" in order to ensure involvement of the communities in developments that significantly alter the environment and availability of natural resources. The rights of the communities which depend of those resources should be enshrined in law so that they could challenge the process. And it should be obligatory for proponents to undergo environmental assessments with a public participation component.

ACKNOWLEDGEMENTS

This practicum work could not have been successfully completed without the unending patience and support of many individuals in both Canada and Lesotho. It is not possible to acknowledge each of them by name, nevertheless they must all rest assured that their support was highly appreciated.

I would like to extend my thanks to my Faculty Advisor Dr. Fikret Berkes for his guidance throughout this study, from its conception up to its final moment. In addition, I would like to voice a vote of thanks to my Committee members, namely; Dr. G.G.C. Robinson, Dr. Ed Onyebuchi and Professor Thomas Henley for their invaluable input into this study.

I am singularly beholden to the National University of Lesotho for giving me a study leave to pursue this programme. My special thanks and gratitude to Dr. Gwen Malahleha for helping me during my early stages of my career in the Institute of Southern African Studies. I am grateful to the Canadian International Development Agency for providing me with financial support without which my studies here in Canada could not have been possible. A vote of thanks also to Eduplus Management Group in Montreal for making my stay here in Canada like home.

I am also very grateful to my family, my parents Pheello and Manthuseng Letsela for their warm words of encouragement throughout my study life, my wife Maletsela Letsela, and my daughter Mpho Letsela for their unending support and endurance of my prolonged absence from home.

Finally, I owe special thanks and gratitude to my friends and colleagues here in Winnipeg, I hope our paths will cross again in the future.

TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGMENTS.....	iv
TABLE OF CONTENTS.....	v
LIST OF FIGURES.....	viii
LIST OF TABLES.....	viii
LIST OF PLATES.....	viii

CHAPTER ONE

INTRODUCTION

1.1	Lesotho: A Brief Overview.....	1
1.2	Climate.....	4
1.3	Traditional Land Management.....	7
1.4	Agriculture.....	9
1.5	The establishment of agricultural development projects in Lesotho.....	12
1.6	The Issue Statement.....	13
1.6.1	Objectives of the study.....	15
1.6.1.1	Specific Objectives.....	15

CHAPTER TWO

THE PROJECT

2.1	A Summary of the activities of the Project.....	18
2.1.1	Overview.....	19
2.1.2	Mechanical Structures.....	21
2.1.2.1	Graded Terraces.....	21
2.1.2.2	Grassed Waterways.....	21
2.1.2.3	Diversions.....	22
2.1.2.4	Donga Control Structures.....	22
2.2.1	The Agricultural Project Path to Rural Development.....	23
2.2.2	Approach to the study.....	25
2.2.3	Importance of the study.....	26

CHAPTER THREE

LITERATURE REVIEW

3.1	Theoretical context.....	27
3.1.1	Overview.....	27
3.1.2	Lesotho: Environmental Degradation.....	28
3.1.3	Traditional Ecological Knowledge.....	32
3.1.4	Sustainable Rural Development.....	34
3.2	Soil Erosion in Lesotho.....	38
3.2.1	Precipitation and Erosion.....	38
3.2.2	Erosion Processes and Forms.....	39
3.2.2.1	Sheet Erosion.....	39
3.2.2.2	Rill Erosion.....	40
3.2.2.3	Donga Erosion.....	40
3.3	Summary.....	41

CHAPTER FOUR

METHODS

4.1	Location.....	42
4.2	Research Design.....	44
4.3	Interviews and Questionnaire guided Discussions.....	46
4.5	Field Experience.....	47

CHAPTER FIVE

RESULTS

5.1	The Demographic Profile.....	49
5.1.1	Income.....	49
5.1.2	Sex, Age and Marital Status.....	53
5.1.3	Household Size and Arable Land Holding.....	56
5.2	Causes of Environmental Degradation.....	61
5.3	The Local View of Conservation.....	73
5.4	Local views about Thaba Bosiu Project.....	77

CHAPTER SIX

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

6.1	Discussion.....	83
6.2	The Broader causes of environmental degradation.....	87
6.3	Conclusions.....	93
6.4	Recommendations.....	95
6.4.1	Broad Recommendations.....	98
6.4.2	Specific Recommendations.....	98
REFERENCES.....		100
APPENDIX A.....		106
APPENDIX B.....		114
APPENDIX C.....		115

LIST OF FIGURES

Figure:

1.	Ecological zones of Lesotho	3
2.	The Location of Thaba Bosiu Project	17
3.	The Sustainable Development Model	37
4.	The Location of the study area	43
5.	Regional Divisions of the study area	45
6.	Sex and Age distribution of respondents	54
7.	Marital status of respondents	55
8.	Number of Field holdings per household in Thaba Bosiu	60
9.	Causes of environmental degradation in the area according to respondents	63
10.	Relationship between Poverty and Environmental Degradation	92

LIST OF TABLES

Table:

1.	Mean monthly and annual rainfall in Lesotho	6
2.	Conservation strategies used by Thaba Bosiu Project	18
3.	Reported sources of income	51
4.	The Number of people in each household	57
5.	Anthropogenic causes of environmental degradation in Thaba Bosiu	72
6.	Cultural values and practices that have impact on environmental degradation in Lesotho	76
7.	Suggested division of responsibility for land rehabilitation in Lesotho	78
8.	Respondents evaluation of Thaba Bosiu Project	79
9.	Reasons why Thaba Bosiu Project was not successful according respondents	80

LIST OF PLATES

Plate:

1.	A Sesotho sledge	10
2.	A Sesotho sledge being pulled by a span of oxen	11
3.	An aerial photograph showing contour ploughing, graded terraces and waterway channels at Thaba Bosiu	20
4.	Women carrying animal dung for domestic fuel	65
5.	A bunch of stubble collected for domestic fuel	66
6.	A woman cooking with stubble fuel	67
7.	Cattle grazing on stubble	68
8.	Active erosion at Thaba Bosiu	69
9.	Active erosion, and overgrazed mountain slopes	70

10.	Collapsed gabion structures at Ha Ratau	81
11.	Footpaths and active erosion at Ha Ratau	82

CHAPTER ONE



INTRODUCTION

1.1 LESOTHO: A BRIEF OVERVIEW

Lesotho is a small land-locked country of about 30, 350 square kilometres surrounded by the Republic of South Africa. It became a British protectorate in 1868, and obtained its independence in 1966. During its colonial period it was officially known as Basutoland but was still recognised in its original name, Lesotho by the Basotho people.

Before the nineteenth century the geopolitical entity now known as Lesotho did not exist. The *Sesotho* speaking societies which inhabited this area were organised into chiefdoms that depended on crop production and cattle herding. However, during the political turmoil that was unleashed by the rise of the Zulu nation under Shaka between 1822 and 1836, these chiefdoms were consolidated together by Moshoeshoe, the chief of Bakoena, and formed the nucleus of the Basotho nation. As a result, the country of Lesotho and the nation of Basotho were born.

The contemporary geopolitical Lesotho was however defined later in 1869 by the Treaty of Aliwal North which was presided upon by the British government. As a result of this Treaty Basotho lost a huge province of their land to South Africa leaving behind a small piece which is 75 percent mountainous and only 15 percent arable.

The country of Lesotho lies between the 28° and 31° latitudes in the south and is bordered by the 27° and 30° longitudes in the east. It is divided into four ecological zones on the basis of its topography (Figure 1). The zones are, the lowlands, the foothills, the mountains and the Senqu (Orange) River Valley. The lowlands occupy a narrow strip of land along the western border and rise to about 1981 meters above sea level. It is in this zone where most urban centres are located, and where most arable agriculture is practised. The foothills consist of all the land between 1981 and 2286 meters, and are situated between the lowlands and the mountains. The mountains cover elevations above 2286 meters and constitute about three quarters of the country's total size. And the fourth zone is the Senqu River valley which is a floodplain in the mountain zone created by the Senqu River as it cuts through the mountains on its course to the Atlantic ocean.

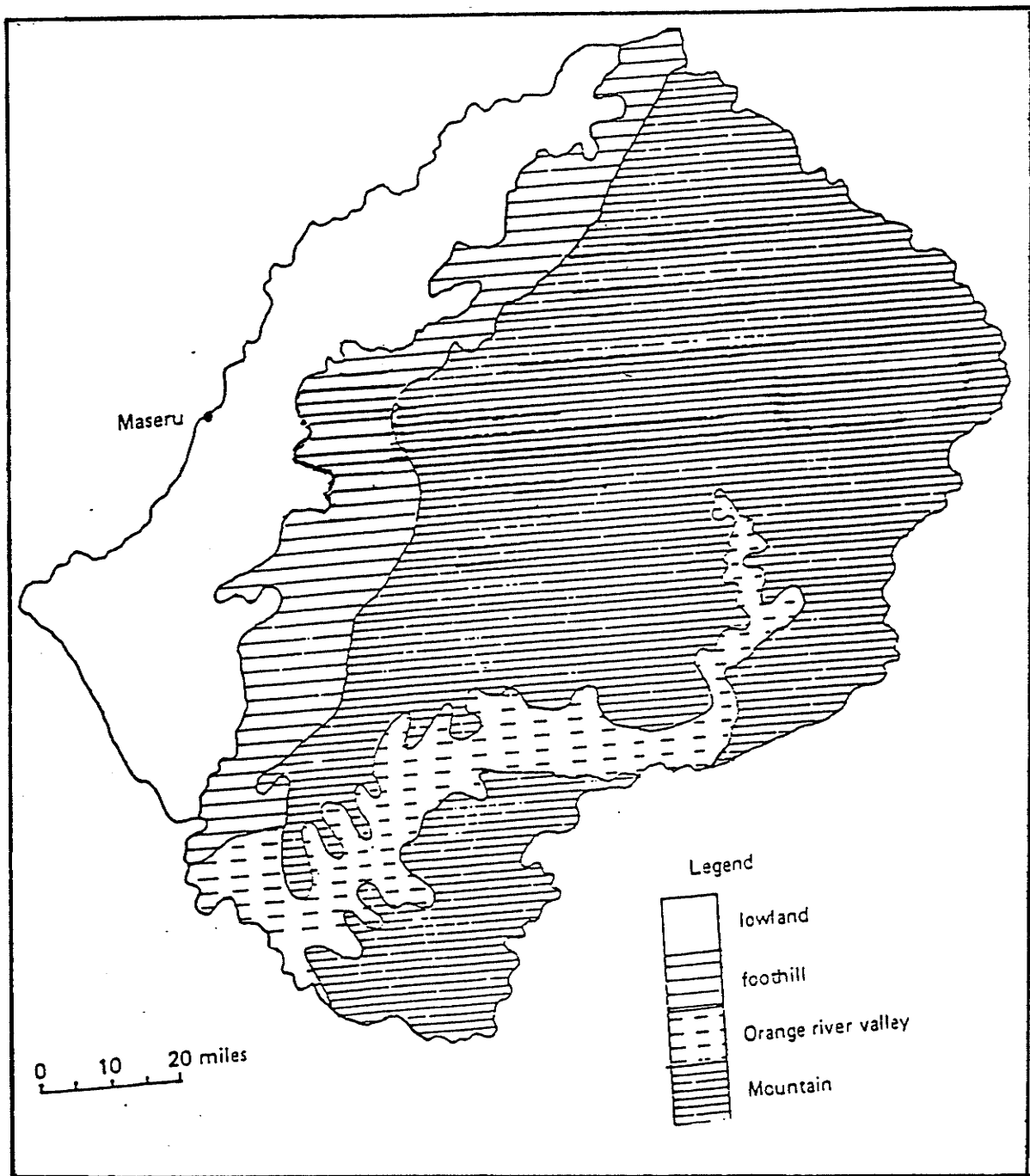


Figure 1: Ecological zones of Lesotho

Source: Makhanya, 1979

1.2 CLIMATE

As a result of vast differences in topography, the climate in Lesotho varies considerably from one region to another. But generally winters are cold and dry, becoming much more severe in the mountains. Freezing temperatures occur between May and August, but generally during daytime temperatures rise above freezing point. Frosts occur throughout the winter (May to August) but may also occur in any month of the year. Mean summer temperatures are about 20°C.

Precipitation primarily occurs in summer months, although snow is common in July, especially in the mountains. The annual rainfall varies from year to year, and is unevenly distributed within a year. The normal annual rainfall averages 750mm (see Table 1) but varies considerably with ecological zones, with the mountains receiving most of the rain. Rainfall typically occurs in discrete storm events, often of high intensity. And as Jayamaha (1990) observed, storms producing more than 100mm in a 24 hour period are not uncommon during the rainy season with the highest rainfall occurring in summer (January to March). The rainy season is usually during the spring and summer months i.e. September to March. Most storms are accompanied by thunder, lightening and hailstones which can range in size from less than a centimetre to several centimetres. Jayamaha (1990) goes further to note that most parts of Lesotho receive either seven or eight hailstorms each year, the highest frequency of occurrence in the whole southern African subregion. Between the storms the atmospheric humidity is low, the sun shines, temperatures are high and the environment dries out. Thus plant growth in Lesotho is limited by both moisture and temperature. The annual growing season begins around September when sufficient rain has fallen to moisten the soil, and ends when the first frosts commence in late March to early April. The growing season is thus dependent on

independent climatic variables, and hence has unpredictable length. Even when already in progress it can be affected by dry spells, hails, and untimely frosts.

Although agriculture is the mainstay of the rural households, it depends completely on rainfall. No irrigation is practised, and at least up to now, no irrigation potentials are being explored. In spite of that, it is the first rains that signal the commencement of the agricultural season, and it is rainfall cessation that signals that the season is coming to a close. Yet the whole dependence on rainfall in Lesotho and the entire region of Africa south of the Equator is experiencing high recurrence rate of drought which results in food scarcity and hunger. In most African societies this was dealt with by storing large quantities of grains during the good years, and sharing the food through the extended family system and other traditional systems, such as the *mafisa*¹ system in Lesotho, the systems which have been completely undermined by the westernisation of the African society. Consequently, drought poses a more imperious threat to the rural poor now than it used to, with the only available assistance just coming from western donor communities with no local involvement. The collapse of the social structure as a result of westernisation has divided countries into the "haves and have-not." The "have" in these countries have relinquished their traditional social responsibility of helping the underprivileged and invested it in the international community. The result is foreign aid which is only available during disaster periods. As a result the quality of life of rural people who depend predominantly on rainfed subsistence agriculture is progressively declining with increased drought recurrence and continued environmental degradation.

¹ Mafisa is the communal sharing system in which a wealthy animal owner loans some of his animals to the poor in generosity.

Table 1: Mean monthly and annual rainfall in Lesotho

PLACE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Year
Mohal's Hoek	110.3	115.5	96.7	59.7	40.0	9.2	17.4	14.2	28.6	67.1	88.9	102.7	750.1
Quthing	98.9	100.5	94.2	66.8	42.9	13.0	15.8	17.5	35.3	68.2	83.8	103.1	740.0
Tosing	101.9	102.4	98.1	53.6	40.9	8.2	11.8	18.1	34.3	83.7	83.4	101.3	737.7
Whitehill	85.2	77.3	67.0	37.1	23.5	8.4	9.4	12.8	25.4	53.6	70.4	99.2	569.3
Rapase	85.2	78.6	60.4	32.8	22.7	7.0	9.7	12.3	26.0	47.7	63.9	84.9	531.2
Qacha's Nek	177.4	160.3	124.0	53.0	30.8	10.5	12.9	17.7	37.7	69.3	113.1	151.7	958.3
Mafeteng	103.8	119.9	99.5	65.7	35.2	8.5	14.2	16.3	28.3	64.7	79.0	94.9	730.0
Mpharane	109.8	132.8	101.3	70.1	37.7	9.4	20.5	20.9	33.8	75.6	90.5	115.9	818.3
Marakabei	118.8	129.5	97.8	68.0	48.8	13.5	24.6	20.2	39.0	89.1	100.8	111.0	861.1
Sehong-hong	100.4	79.3	69.5	29.1	24.1	3.9	9.7	11.3	23.4	51.3	71.8	83.6	557.4
Mashai	94.4	77.4	60.2	22.7	24.2	3.5	8.2	11.2	19.0	48.4	66.3	83.5	519.0
Sani Pass	158.8	156.6	119.5	48.3	38.1	8.4	19.5	15.1	35.9	85.3	150.2	146.3	982.2
Maseru	112.6	98.0	93.0	63.1	30.0	7.6	14.7	15.1	21.1	64.7	93.7	95.2	708.8
Thaba Bosiu	100.5	115.1	96.1	64.9	39.2	7.9	13.3	16.7	24.5	70.5	80.4	99.0	728.5
Roma	116.4	125.8	106.1	93.0	38.1	10.6	17.0	18.1	29.0	80.0	106.0	124.0	844.1
Thaba Tseka	101.1	79.8	73.5	36.5	29.4	4.8	13.8	12.6	27.3	65.9	79.2	89.7	613.6
Mokhotlong	98.4	84.1	64.0	35.1	23.2	8.0	9.5	12.9	22.7	57.1	81.1	88.4	584.5
Pitseng	154.2	138.4	105.1	75.3	45.8	9.7	14.6	15.0	33.6	101.	127.2	153.0	973.8
Oxbow	212.9	127.3	163.4	109.1	63.4	20.9	19.5	32.2	58.9	126.	177.5	168.9	1280.

Source: Jayamaha, 1990. (see Appendix C for location of the areas).

1.3 TRADITIONAL LAND MANAGEMENT

The land tenure system in Lesotho is rooted in millennia-old traditions of African peoples under which land is a societal asset which is held in trust by the Monarch. In this tenure system, land and its resources are to be used for social welfare of everybody and all people have a say on how they are used. Consequently, land in Lesotho belongs to the Basotho nation and is held in trust by the King (Government of Lesotho, 1979). The King exercises this proprietary responsibility through a nested-hierarchy of chiefs which begins down at the village level and builds up to the Monarch. This hierarchy begins from the village headman (*Ramotse*), to the ward chief (*Morena oa sebaka*), to the principal chief (*Morena oa sehloho*) and culminates with the King (*Motlotehi*). The chiefs are assisted by the Village Development Councils (VDCs) which are comprised of community representatives elected democratically by a majority vote at the *Pitso* (local assembly) (Morapeli, 1990). The chiefs act as *ex-officio* chairpersons of these councils.

The underpinning principle of this land tenure system is that land is a national and social asset that has to be utilised for the benefit of the nation. The system entitles all Basotho households a free and equitable access to land for residential and agricultural purposes. According to this system, every adult male in the community has a right to be allocated land for subsistence of his family. However, if the land is not utilised for three consecutive years, the chief has the authority to confiscate it in the interest of the community for re-allocation (Morapeli, 1990), an authority which is almost never exercised. There are several arguments advanced by various researchers, questioning the property rights conferred to the allocatee by this land tenure system. Some analysts argue that once allocated, the communal proprietary claim on that land becomes significantly diminished conferring on the allocated full and unrestricted usufructuary right. And in reality, once a piece of land is

allocated, the community no longer has any control over how it is used. It is only the rangelands, natural woodlands and all other commons which still remain open access resources under the custodianship of the communities in which they occur. Their use is non-exclusive and non-rival to the community members, but there exists control of access for people coming from other communities.

Whereas some African societies still maintain seasonal migrations following the rains, Basotho have a long history of permanent settlement. Hence, the contemporary customary tenure in Lesotho is tailored to permanently settled people. Historically when land was still in abundance each household was allocated on average three diminutive fields with no standard acreage considered. The size usually depending on topographic conditions, being larger in the lowlands and the foothills than in the mountains. The land parcels were usually widely scattered as an insurance against damage to the crops and to increase probability of getting good soils for each staple crop, the staple crops being maize, sorghum, beans and peas. However, this equitable land holding was curtailed by increased population pressure, urbanisation and villagisation. Presently, arable land is acquired by inheritance from the family by the sons through the paternal line. Daughters inherit it through their husbands on marriage. This scarcity of land has triggered landlessness which is now estimated at 38 percent (Matlosa, 1993). The consequence of this landlessness is mass migration of the people from the rural areas to urban centres to seek employment. Notable in this is the eminent mass migration of Basotho men to seek employment in the South African mining industry.

This set in motion a series of developments with profound implications for the environment. The principal mechanism being the permanent establishment of a migratory system which has resulted in prolonged periods of absence of men in the society, and

hence consequent neglect of their role in resource management. The absence of these men in Lesotho has effectively impaired the traditional systems of resource management by delegating responsibility to women and children, and old and often sickly men, thus laying foundations for the present environmental crisis.

1.4 AGRICULTURE

Traditional agriculture in Lesotho involves the use of ox-drawn implements such as ploughs, planters, harrows, cultivators, sledges. In the past few decades, two-wheeled carts for transportation of farm implements to and from the fields gained widespread use replacing traditional wooden sledges (see Plates 1 and 2). There is now widespread use of hired tractor services for tilling the soil, substituting traditional ox-drawn ploughs, although all subsequent practices still remain predominantly the same.

Through history, intercropping and fallowing have been predominant conservation practices. But as land scarcity increased, conservation fallowing was substituted with crop rotation (Eldredge, 1986). Intercropping and hand casting of seeds were replaced with continuous monocropping and row planting. The result was increased topsoil loss and declining yields. As Germond (1967) details, the population pressure due to emigrations and high birth rate, and a loss of province in the nineteenth century led to the inhabitation of the mountain zone, and the consequent ploughing of the marginal lands.



Plate 1: A Sesotho sledge

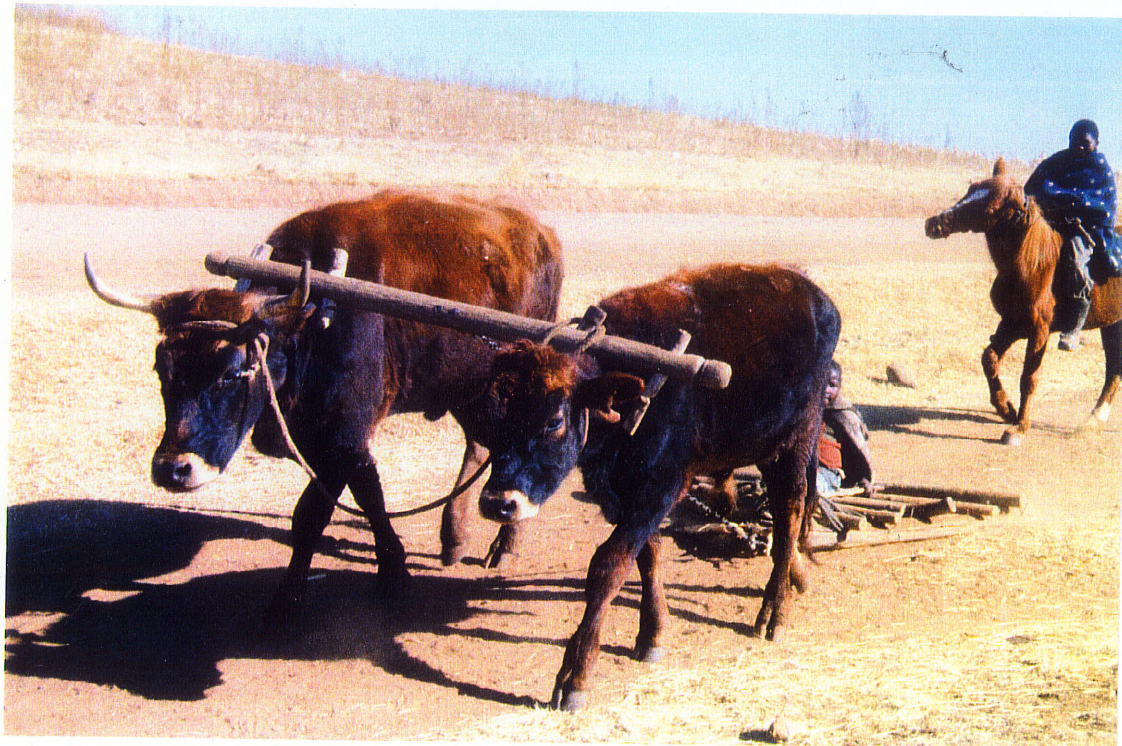


Plate 2: A Sesotho sledge being pulled by a span of oxen

1.5 THE ESTABLISHMENT OF AGRICULTURAL DEVELOPMENT PROJECTS IN LESOTHO

Lesotho was a net exporter of agricultural products until the late 1920s. However, it has been experiencing declining agricultural productivity compensated by increased importation of food supplies from neighbouring countries, particularly South Africa. Immediately after obtaining its independence from the British in 1966, the new government implemented several agricultural development projects which were based on imported technology and expertise, and were not affordable to the farmers. Furthermore, the new methods were constrained by the progressively shrinking, and fragmentation of available arable land as the population continued to grow.

All arable land has already been allocated in Lesotho, there is literally no more virgin land for novice allocation. As a consequence of that, agricultural development projects implemented by government had to operate on land already allocated to individual farmers. In order to facilitate their activities, the projects organised and consolidated adjacent fields into contiguous large production blocks, the rationale being that it would be technically and economically more viable to operate large production units as opposed to small traditional plots (Ngqaleni, 1990). This was the thinking behind the "area based" projects, which included the Thaba Bosiu Rural Development Project, Khomokhoana Rural Development Project, Thaba Tseka Mountain Area Development Project, Senqu River Rural Development Project, and many others. According to Ngqaleni (1990), farmers participated in these projects with an understanding that the power sharing structure was similar to traditional share-cropping, in which decisions are based on consensus of all the stakeholders, and the produce is shared equally at the end of the harvesting period. But

with the projects costs were to be recovered from the harvest and farmers allocated residual produce.

In this new dispensation, farmers were removed from the decision making process and only participated as labourers. They became cheap labour paid with food-for-work payment. In projects with a soil conservation component, such as, the Thaba Bosiu project conservation responsibility was also assumed by the project management.

1.6 THE ISSUE STATEMENT

In the past, soil erosion was seen as a physical process to be controlled, mainly by physical measures, without recognising that the process was possibly related to land management systems. Physical measures designed to prevent or slow down the process of soil erosion would then be considered, and strategies which usually depended heavily on the construction of bench terraces, contour banks, check dams, waterways and similar works then employed.

The problem was thus considered from an engineering perspective with no regard to land management practices of which soil erosion is just a symptom. Lesotho is a direct victim of this conventional approach. Evidence of soil erosion is widespread in the country. The entire landscape is lacerated by *dongas* (gullies) which in some places go as deep as two to several meters. Rain splash, sheet erosion, and mass movement are common features, particularly in the foothills and mountains (Schimitz and Rooyani, 1987) while *donga* erosion is quite prevalent in the lowlands. Because of limitations of topography, arable agriculture is mostly practised in the foothills and the lowlands, the regions which have been heavily impacted by *donga* and sheet erosion.

Since the late 1920s the country has been experiencing progressive decline in agricultural production, and several studies undertaken in the country attribute the problem to loss of topsoil, and the primitive farming methods of the Basotho farmers. Lesotho is now considered by the Southern African Development Community (SADC) as the country most severely degraded in southern Africa (Government of Lesotho, 1989).

In its attempt to mitigate the problem, the government of Lesotho implemented several agricultural projects with a twofold mandate: firstly to rehabilitate the degraded agricultural landscape of Lesotho; and secondly to stimulate productivity in order to reduce dependency on food imports from the neighbouring countries, in particular South Africa. The overall aim was to transform the traditional production system to achieve a revolutionary increase in food through the expansion of mechanised agriculture. The most obvious observation is the fact that these projects were not built on traditional systems but rather on imported skills and technology.

Therefore, the intent of this practicum study is to assess the ecological and social repercussions of these projects on Lesotho's social ecology. The underpinning thesis of the study being that, a thorough understanding of traditional farming practices and local needs are vital in determining the relevance, practicability and the potential success of the proposed changes and innovations in agricultural development. That rather than attempting to impose new imported methods in socio-economic environments which are not suitable, perhaps what is essential is the reappraisal of the local systems- building on those principles which previously formed a solid foundation for sustainable livelihoods, and tailoring new developments to the existing ecological framework.

1.6.1 OBJECTIVES OF THE STUDY

The primary purpose of this study was to assess causes of environmental degradation in Lesotho, and the extent to which the Thaba Bosiu Rural Development Project mitigated the problem in the Thaba Bosiu catchment.

1.6.1.1 SPECIFIC OBJECTIVES

- 1) to determine causes of environmental degradation in Lesotho;
- 2) to assess the success of Thaba Bosiu project in mitigating environmental degradation problem in Thaba Bosiu;
- 3) to determine the local people's views and perspectives about environmental conservation in the study area;
- 4) to recommend general policies that could be used to improve present land use and future rural development attempts in Lesotho towards sustainable development.

CHAPTER TWO



THE PROJECT

Thaba Bosiu Rural Development Project (TBRDP) (here on referred to as Thaba Bosiu Project) has been selected as a case study to investigate the impacts of agricultural development projects on the agricultural landscape of Lesotho. Thaba Bosiu Project was a joint effort between the government of Lesotho, the World Bank and the United States Agency for International Development (USAID). It geographically covered two ecological zones namely, the foothills and the lowlands (see Figure 2) and ran for a period of five years commencing in 1973 and ending in 1979.

The basic objectives of the project were:

- 1) to increase the income derived from crop and livestock production, and;
- 2) embark on conservation measures to minimise the unprecedented soil erosion problem in the area.

Funding for the project was provided by the International Development Association (IDA), United States Agency for International Development (USAID), United Nations Capital Development Fund (UNCDF), United Nations Development Programme (UNDP), Commercial Bank, United States Peace Corps and the United Nations International Volunteer Service (TBRDP, 1979).

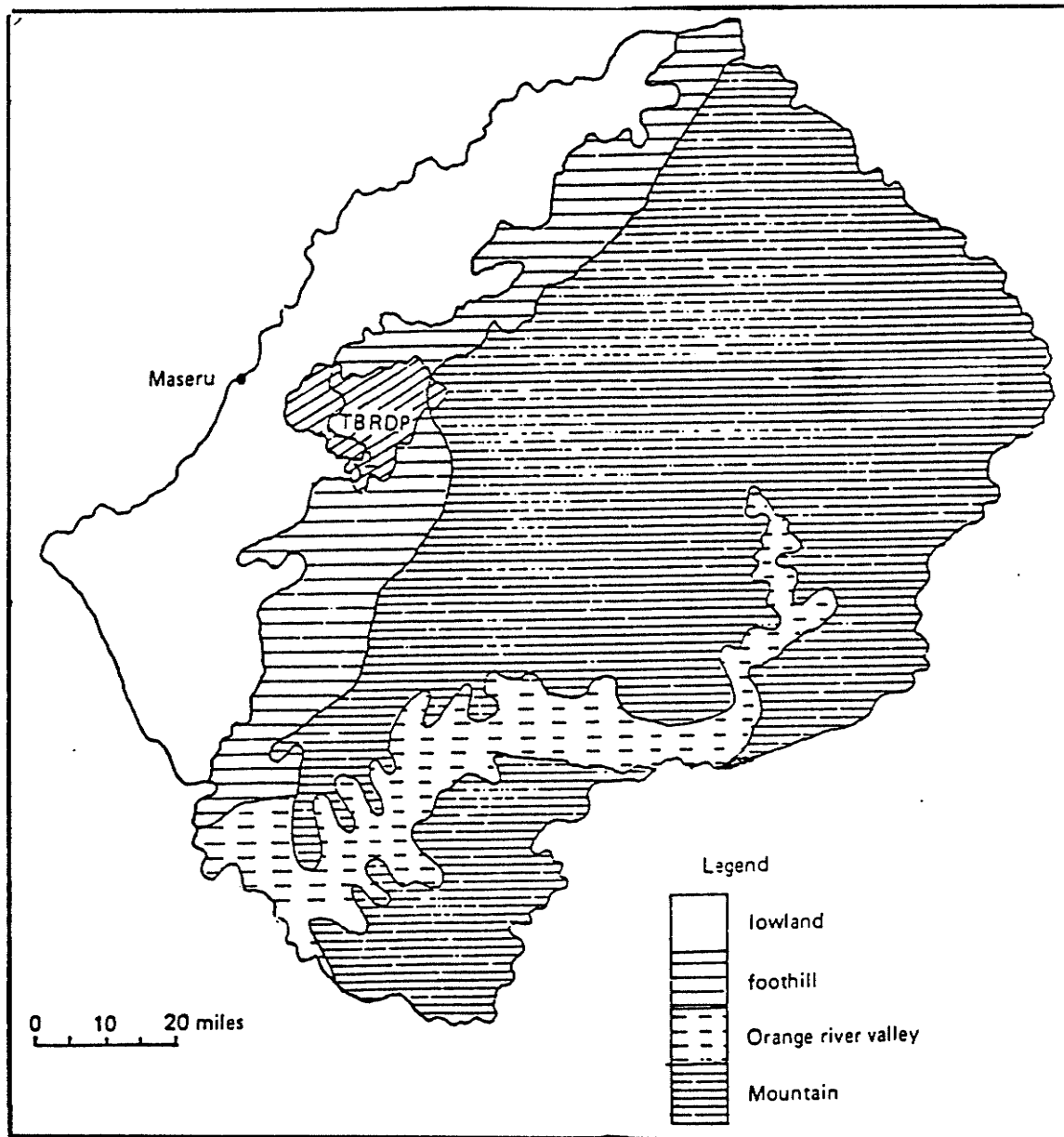


Figure 2: The location of Thaba Bosiu Rural Development Project

Source: Makhanya, 1979

2.1 A SUMMARY OF THE ACTIVITIES OF THE PROJECT

Thaba Bosiu Project employed several strategies to rehabilitate the degraded agricultural landscape in Thaba Bosiu area. These are presented below in Table 2. The second column deals with the mechanical structures that were built to control water runoff. These mechanical structures were the major thrust of the Thaba Bosiu Project.

Table 2: Conservation strategies used by Thaba Bosiu Rural Development Project

STRATEGIES	MAJOR CROPLAND MECHANICAL STRUCTURES BUILT
Donga Control	
Loose Stone Structures	
Gabion Structures	Gabion structures
Grass Seeding	
Diversions	Diversions
Graded Terraces	Graded Terraces
Tree Planting	
Grassed Waterway Channels	Grassed Waterway Channels
Orchards	
Fields Roads	
Village Roads	
Land Realignment	

Source: Compiled from TBRDP Report 16/13 (1979), TBRDP and Thaba Bosiu Conservation Section (TBCS) (1979) Final Report, and the following conservation plan documents by TBRDP: Khotso Conservation Plan, Molengoane Conservation Plan, and Tumahole Conservation Plan.

2.1.1 OVERVIEW

As the diagram above illustrates, almost all the conservation structures built by the Thaba Bosiu Project were primarily concerned with controlling water erosion. And as Schimitz and Rooyani (1987) observed, water erosion is indeed the most imperious form of erosion in Lesotho due to erratic and seasonal nature of rainfall. The vacillation between wet and dry periods spawns conducive climate for erosion by falling rain drops and hail pellets. The thrust of the Thaba Bosiu Project was therefore to control water runoff in order to protect the cropland.

The object of the mechanical structures constructed was to collect, and then channel all erosive runoff into grassed waterways at a safe velocity. The waterways would then drain runoff into natural drainages such as streams or embankment dams. But in order for this system to function effectively, all farmers in the rehabilitated area had to practice contour ploughing. The concept of contour ploughing was not in itself new to Basotho farmers. Its practice probably dates as far back as the adoption of the ox-drawn plough in the nineteenth century. It became widely used following the countrywide terracing of Lesotho's agricultural landscape by the colonial government in the 1930s and 1940s. However, the irregularity of the fields' shapes at this stage, and lack of access roads to the fields reduced the protective capability of the terraces built by the colonial government, as farmers had to drag their equipment across them when they worked their land. This led to intermittent breaking of terraces and erosion of cropland topsoil. In order to redress this problem, Thaba Bosiu Project embarked on a massive land realignment programme in the Thaba Bosiu area designed to make sure that all fields fell between terraces, and were bordered on both ends by waterways (see Plate 3).

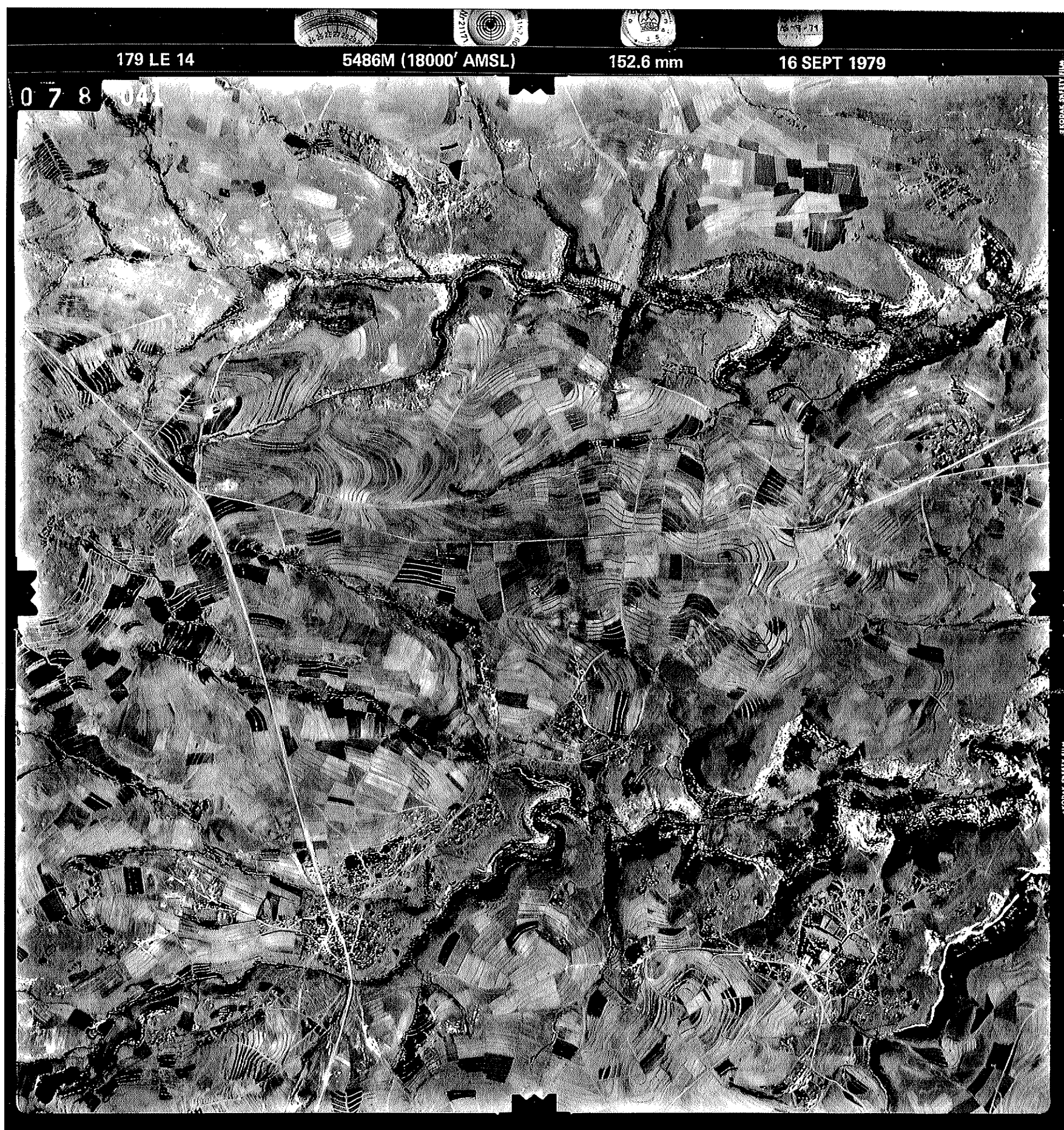


Plate 3: An aerial photograph showing contour ploughing, graded terraces and waterway channels at Ha Ratau .

2.1.2 MECHANICAL STRUCTURES

2.1.2.1 Graded Terraces

Graded terraces were designed to intercept runoff and carry it to a protected outlet - waterways- in order to minimise its erosive capability. Graded Terraces control soil erosion by shortening the effective slope length, which reduces the flow of water down the slope.

The graded terraces built by Thaba Bosiu Project had a gradient of about 0.3 percent with a maximum length of 500 metres (TBRDP, 1978). In cases where terraces curved around natural depressions, an effective gradient of 1 percent was used since early trials had demonstrated that ponding occurred when 0.3 percent was used. All terraces were planted to *Eragrostis cuvula* which was later used for winter grazing by the communities.

2.1.2.2 Grassed Waterways

Grassed waterways are wide channels which were designed specifically to transport water at a nonerosive velocity from the fields, diversions, terraces and road ditches. They drained off water load into natural streams, *dongas* and embankment dams. In order to minimise erosion on these structures *kikuyu* grass was planted. *Kikuyu* grass forms a dense carpet on the ground which provides a good vegetation cover. Although it requires periodic topdressing, the Project felt that it was the best available option as opposed to other native grasses such as *Eragrostis cuvula* which are bunch grasses. Once established, waterways were used for summer grazing by the communities also.

2.1.2.3 Diversions

Diversions were designed to intercept and divert surface runoff from the higher ground with the primary purpose of protecting the lower land. These are immensely important structures in Lesotho because of the mountainous nature of the landscape. However, in order to remain effective for an extended period of time they require continuous maintenance to minimise clogging. Soil depositions and debris easily clog the channels resulting in overtopping at clogged places which renders the structures completely ineffective. Diversions ought be used with extreme care especially in mountainous landscapes such as Lesotho because they could easily develop into *dongas*. They are usually devoid of vegetation which exposes the ground to erosion by the action of water currents. Unlike graded terraces, diversion furrows have been used in Lesotho since time immemorial.

2.1.2.4 Donga Control Structures

These are structures primarily concerned with reducing further erosion in the *dongas* and diversion drains. They spread runoff and trap suspended load and debris. The Project used different forms of *donga* control structures. In some cases loose rocks were used, particularly in small *dongas*. But in cases where the water load was considered high, wire netted structures (gabions) were used to prevent the breakdown of the rock dams. Like diversion furrows, construction of stone walls in *dongas* is as old as mechanical conservation in Lesotho.

2.2.1 THE AGRICULTURAL PROJECT PATH TO RURAL DEVELOPMENT

For the past several decades, development thinking has been dominated by a paradigm in which all developing countries were expected to follow the same development path irrespective of their resource capital, ecology, social structure, political orientation, and historical background (Jazairy *et al.* 1992). And conventionally since most developing countries were regarded as traditional societies, the most pursued avenue was agricultural development. In which pursuit, numerous projects financed for most part by multilateral and bilateral donors were implemented. These projects were designed with the expressed purpose of promoting economic growth by integrating the rural poor into the economic process, and transforming the rural landscape into a merchantable resource.

The universal application of this development paradigm in many developing countries set in motion profound social and ecological disruptions and imbalances. It triggered mass migrations, collapse of the social fabric, increased land degradation, the tragedy of the commons, and regrettably continued impoverishment of the rural poor. Examples of such projects in Africa include the destruction of the Barabaig traditional grazing system, and increased environmental degradation in the Hanang Plains in Arusha Tanzania (Lane, 1990); the failure of soil conservation projects in the Ethiopian highlands in the 1980s (Stahl, 1990); desertification in the Sahel (Sinclair and Fryxell, 1985; Olsson and Rapp, 1991); the building of irrigation schemes on the Tana River in Kenya (Hughes, 1987), and many others.

The common feature in all these projects is the fact that they were designed and implemented without any regard to their impact on the delicate ecological balances and the complex social and cultural institutions in these countries. They defined the problems

narrowly as the loss of topsoil, disappearance of forests, extinction of species, spread of deserts, pollution of waterways, and declining yields (Ghai, 1992). The interlinkages and interconnectedness of the biophysical environment, development, and human welfare were ignored. And from the development organisation (governments, industry, and financial institutions) perspective the villain was always the subsistence farmer and the pastoralist whose galloping numbers and primitive methods of earning a livelihood were perceived to be putting an intolerable pressure on the environment. With that development mindset, the projects were imposed from above and recipient communities coerced into compliance. The refusal of the communities to capitulate was viewed as hostile behaviour underpinned by ignorance and primitiveness. And the solution prescribed was intensification of extension services. The wholesale failure of agricultural development projects in Lesotho, and many other developing countries is instructive in this regard.

However, in this era of sustainable development and increased sensitivity to environmental role in development, a change in attitude is essential. The necessity for a holistic and a participatory development is imperative in order to plan for what Beanlands and Duinker (1983) call "minimum regret planning." The concept of minimum regret planning as used in this practicum study embodies Chambers' (1983) notion of pluralism. Contrary to the utopian perspective of classical rural development approach discussed above, pluralism recognises multiple causation of rural problems and advocates for multiple objectives and interventions.

2.2.2 APPROACH TO THE STUDY

This study is grounded on the concept of sustainable development, defined by the Brundtland Commission as an ability to ensure that the present generation meets its needs without compromising the needs of future generations (WECD, 1987). The study is also grounded on the concept of empowerment. In this study, empowerment is posited to represent the ultimate in sustainable development. The study argues that empowerment is not just public participation but is a dialectical process of giving power and also receiving power. It is a co-management and partnership between the development organisation (government, industry, and financing institutions) and the public or community. Accordingly, this study is predicated on a paradigm that not only should the development process be formulated to address the needs and aspirations of the present without compromising that of the future, but it should also be participatory and empowering. Thus the development process should just be a vehicle through which people assert their destiny without compromising their own identity; their own self, their culture, their traditions, and their biophysical ambience.

In that regards, the aim of the study was not to judge whether Thaba Bosiu project was a "bad project" or a "good project" *per se*. But simply to evaluate it using the aforementioned tools - sustainability and empowerment. The aim being to contribute positively to the development process in Lesotho by pointing out that a sustainable development process has to interface its economic objectives with the sociocultural and biophysical realities in which it is being implemented. And the sociocultural realities here referred to include, *inter alia*, cultural beliefs, values, norms, historical background and cultural forethought (future history).

2.2.3 IMPORTANCE OF STUDY

Agriculture in Lesotho is the most important sector with 85 percent of the population depending on it either directly or partially (Makhanya, 1979). However, since the 1930s, agricultural productivity has continued to decline and many research studies have attributed this problem in part to soil erosion. Lesotho is heavily eroded such that the Southern African Development Community (SADC) has enlisted it as the country most severely degraded amongst its members. Most of the projects implemented by the government had a top down approach. Farmers were just expected to capitulate to ideas conceived somewhere within the government bureaucracy, and most of these projects did not yield short term benefits to individual farmers. As a result, there was increasing resistance from the farming community resulting in failure or limited success of most of these development projects.

This study intends to bridge this communication gap that is evident between those who intend to help the farmers (i.e. government, development agencies, non-governmental organisations, etc.) and the farming community, by focusing on the farmers and the way they perceive their own problems.

The present study also examined some approaches by which future developments could be improved. These included cooperation with the local communities, incorporation of traditional knowledge, resuscitation and revitalisation of traditional institutions that facilitate sustainable management of natural resources, and equitable distribution of development benefits. It is the contention of this study that inclusion of these elements would improve sustainability of future development undertakings in Lesotho.

CHAPTER THREE



LITERATURE REVIEW

3.1 THEORETICAL CONTEXT

This chapter is presented in two sections. The first is the discussion of the theoretical context of the study which begins with an overview of environmental degradation, then discusses environmental degradation in Lesotho, traditional ecological knowledge, and sustainable rural development. The second section deals specifically with soil erosion in Lesotho, and is divided into the discussion of the impact of precipitation on soil erosion and the definition of erosion processes and forms in the country.

3.1.1 OVERVIEW

The purpose of this section is to set a contextual premise for the study by critiquing, synthesising and highlighting some of the salient features that underpin land management and rural development in Lesotho. The underlying intent is to demonstrate the dialectical relationship that exists between the biophysical environment and the socio-economic environment. It will also be pointed out that when development undertakings are put in place with narrow objectives that ignore the interconnectedness of all pertinent parameters, poverty becomes institutionalised and it manifests itself in several different ways including environmental degradation. It is a cumulative impact of all these parameters that constitutes

a vicious circle of enduring structural impediments to sustainable development. As a result, anthropogenic environmental degradation as posited in this study is simply a symptom of a more pervasive malaise in these landscapes.

The term "environmental degradation" is used here to describe a consequential qualitative decline in landscape quality as a result of some cause and effect. The cause may be either natural or anthropogenic. The term "environmental degradation" as used here encompasses both biophysical and socio-economic dimensions of the landscape. In this study "soil erosion" is used as an indicator of environmental degradation in Lesotho - a choice which is influenced by the fact that the project which is being assessed, namely Thaba Bosiu project, dealt specifically with soil erosion control in the study area. But also because the discussion of soil erosion leads into the various discussion of factors that cause environmental degradation, for example, overgrazing, fuelwood gathering, and so forth, which makes a good connection between the biophysical environment and the socio-economic environment. The definition of socio-economic environment used here encompasses social, economic, cultural, traditional and historic imperatives of the landscape under study.

3.1.2 LESOTHO: ENVIRONMENTAL DEGRADATION

Lesotho has a well-established reputation as an exceptionally eroded landscape (Showers, 1989). Many reports dating as far back as the beginning of the twentieth century have alluded to the increasing environmental degradation problem in all the ecological zones of the country. As Showers (1989) notes, these reports are a mixture of general statements and specific site descriptions in letters and official reports by early European travellers and British administrators in the nineteenth century. In these reports, the physical landscape of

Lesotho (formerly Basutoland) is described as having numerous, vast and unsightly scars upon the surface of the earth (Colonial Annual Report 1911/2 no. 729, 1908). And in subsequent reports towards the close of the nineteenth century, and the beginning of the twentieth century, increasing severity of the problem, and encroachment to the mountain zone was cited. In response the British government established a commission chaired by Sir Alan W. Pim to assess the actual country-wide severity and recommend remedial measures.

Despite all these attempts, in 1990 Dregne wrote that "Lesotho is one of the most eroded countries in Africa, if not in the world." Many studies conducted in the country attributed the problem to what was referred to as "bad" or "primitive" land management systems of Basotho. For example, Ojanduru and Khoachele (1986) talk of "improper methods of cultivation" in their article on Erosional processes, land use, landforms and soils in Khubetsoana area. A baseline survey conducted by the Ministry of Agriculture in 1990 calls them "institutional rigidities." Ferguson (1985) talks about what he calls "the bovine mystique." And the government repeatedly ridiculed traditional Sesotho cattle and cattle herding on numerous occasions over the State radio. Explicitly, the poor subsistence Basotho households were blamed for exacerbating environmental degradation, and refusing to accept new progressive farming methods. These mythologies became so widely accepted as a fact that they formed a part of the description of the Basotho nation.

Nevertheless, whether or not Basotho farmers do indeed practice "bad" and "primitive" farming methods is a highly contentious issue. These are usually pronouncements that are intertwined with arguments for reform of the present customary land tenure from the current social ownership to private ownership. An argument which is predicated on the body of literature which suggests that common property resources promote overexploitation and underdevelopment of resources leading to the tragedy of the commons. However, we

now know that communities do regulate access to, and utilisation of common property resources and that they sometimes provide social frameworks for conservation and development, often more sustainable and more socially equitable than under private ownership (Berkes, 1989; Ancheson, 1989; Galaty, 1994).

This viewpoint of positing the rural poor as ignorant, backward and primitive in Lesotho and elsewhere falls squarely within what Chambers (1983) calls Social Darwinism. That is, a social condition in which the prosperous elites assume superior social status and superior knowledge and have the temerity to lay the blame of poverty and deprivation on the poor. Chambers (1983) goes further to point out that this blanket stereotyping is usually done to hide the pervasive ignorance of the reality on the ground.

Not only are social and biophysical effects of poverty and deprivation not well understood, but the synergism of these factors presents tremendous problems in both policy formulation and analysis. As Ghai (1992) points out, the social consequences of environmental degradation are broad and permeate all sectors of our society, ranging from death to pauperisation, from hunger to ill-health, from community disruption to family break-ups, from massive migrations to huge work loads, and from local conflicts to national and regional conflicts. These are complex issues that are not related to each other in a simple linear fashion.

Unfortunately, the simplistic view of a single-cause, single-solution that has been used over time in these landscapes has spawned its own new environmental problems, such as, the expansion of desert boundaries in the Sahel due to improper land management policies (Sterwart and Tiessen, 1990; Sincliar and Fryxell, 1985; Olsson and Rapp, 1991), and

increased land degradation in the Hanang Plains in Tanzania as a result of new government conservation attempts (Lane, 1990).

Nonetheless, despite the universal acceptance of these allegations, there is sufficient room to question whether indeed they do in fact, represent the situation accurately. Governments in Lesotho have put into place erosion control structures based on this utopian belief of a single-cause, single-solution. The first national erosion mitigating program was instituted by the British administration after 1935 following Pim's report (Chakela, 1988). According to Chakela (1988) the history of soil and water conservation in Lesotho can actually be divided into three phases, each marked by changes in government policies and approaches. These are: i) Pre-Pim's phase before-1930, ii) Post-Pim's phase 1935-1965, and iii) Post Colonial Phase 1966 to present.

The Pre-Pim's phase was marked by decentralised conservation measures. Each person took responsibility for conservation of all communal resources under his/her custodian. And the community as a whole took responsibility for conservation of resources in the area under their jurisdiction utilising such traditional institutions as the chieftainship and communal work parties (*matsema*). Conservation during this period was thus a social responsibility endured through cultural values, norms and practices. As Chakela says the "major participants in conservation during this early period seem to have been the farmers themselves with little government policy direction."

In 1935 Sir Alan W. Pim's commission recommended a comprehensive national anti-erosion campaign. The commission had established that only 10 percent of the country was severely affected by soil erosion, and the intention was therefore to reclaim that 10 percent in order to protect the remaining 90 percent of the country from further erosion. Since the

campaign was initiated when an estimated 10 percent of the land suffered from erosion, with the expressed purpose of reclaiming damaged areas of the landscape and prevent the spread of soil erosion, the existence of extensive and more pervasive soil erosion in Lesotho today suggests a serious technical failure.

The third phase, the Post Colonial Phase was marked by more government involvement in the form of area based development projects. As discussed earlier, these projects were engineered and run by the government with very little public involvement. There was no public participation from the conception of the projects right through implementation. Experts and government officials assumed all the responsibility relegating communities to a mere status of manual labourers. Ironically, the Basotho, a society that just 100 years ago depended completely on its traditional ecological knowledge for management and conservation of its resources was finally fully penetrated by westernisation. Sesotho society had abandoned its traditional knowledge, and regressively undermined and dismantled the remaining few traditional institutions, e.g. *mafisa* system and traditional grazing systems. Increasing environmental degradation in Lesotho in the past few decades ought however to be more instructive than paradoxical. It ought to serve as a litmus test of the course of development that Lesotho is undertaking. It ought to serve as a challenge to the contemporary *modus operandi*, and perhaps reprimand recourse to the status quo.

3.1.3 TRADITIONAL ECOLOGICAL KNOWLEDGE

Traditional ecological knowledge is defined by Gadgil *et al.* (1993) as "a cumulative body of knowledge and beliefs handed down through the generations by cultural transmission about the relationship of living beings (including humans) with one another, and with the environment." The definition clearly embodies an element of care and respect for the social

structure of the communities involved in natural resources management. The interdependence between humans and the environment is clearly spelled out. Gadgil *et al.* (1993) further recognise that many indigenous communities have from time immemorial viewed themselves as not being separate from nature nor as the central focus, but rather as an integral part of the whole maze of interrelationships that comprise natural systems.

Holling (1990) describes and extrapolates this interdependence to include plant and animal communities and explains them as natural assemblages which interact in both space and time, transforming and also being transformed by the physical and chemical environment that envelops them and of which they are a part. Which means that a landscape represents a mosaic of cultural, biological and physical attributes that have evolved over time between all the various participants in the landscape architecture (Cox and Atkins, 1979). Such that a human community inhabiting a particular landscape usually possesses some of the fundamental characteristics of that landscape in the form of values, norms, beliefs, and culture. And these are manifested in the way that community interacts with its environment.

There is a growing literature around the world documenting millennia old sustainable practices by various indigenous communities negating or at least putting in question the popular belief that communal management of resources often leads to their degradation - the tragedy of commons scenario as detailed by Garret Hardin in 1968. The whole theory of the tragedy of the commons is rooted on the assumption that users compete for the common resource leading to its overexploitation, and perhaps denudation. But as Berkes (1989) notes, there are numerous empirical observations where users cooperate in order to further their vantage point, and indeed manage their resources sustainably to secure future use.

Many western trained scientists often failed to understand this relationship between the rural people and their environment (Berkes, 1989; Gadgil et al, 1993). To them local farmers are part of the problem and not part of the solution (IFPA, 1990; FAO, 1990). This conventional approach has in many countries resulted in ill-conceived "development projects" which did not actually address the needs of the local people nor national interests but short-sighted economic gains which usually left the affected population worse off than they were before (Ghai, 1992). They no longer only had to deal with the problems that plagued them before the project, but with the negative spin-offs of the projects.

In most of these project oriented approaches to rural development, there was usually no consultation between the recipients of the projects (local communities) and the implementors or developers (governments, donor agencies, industry, etc.). As Adams (1990) argues, this top down approach can be perceived as a "fire-fighting" approach utilised by developers to ameliorate what they consider or what appears to them to be a problem. But as Adams (1992) further observes, this mode of operation does not address the root of the problem but rather addresses the symptoms.

3.1.4 SUSTAINABLE RURAL DEVELOPMENT

The concept of sustainable rural development stems from the sustainable development paradigm. This is not a completely new concept as many indigenous communities have always applied agricultural principles that allowed them to live in harmony with their environment. But since 1987, the World Commission on Environment and Development, colloquially known as the Brundtland Commission, popularised the concept by incorporating in it universal principles that allowed its uniform application across many jurisdictions (Vivian, 1991). Sustainable development as outlined in the Commission's

report - Our Common Future - calls for the development that safeguards that the needs of future generations are taken into consideration when decisions that impinge on their welfare are made. These include decisions on natural resources management, transformation of the physical landscape, and perhaps the change in political and social structures.

The Brundtland Commission elevated sustainable development to an operational approach which embodies the principles, ideas and values accepted as desirable for maintaining the critical balance between ecological integrity and socio-economic aspirations and livelihoods of people. Central in the sustainable development paradigm is the notion of a development process that is equitable between nations and generations, and socially responsive to the extensive nature of poverty and deprivation between and within each nation's classes and communities. In addition, it advocates that the world be seen as one ecosystem. Thus, humans in implementing their development agendas must consider the earth holistically from its hierarchical perspective with careful attention given to the scale and extent of all the activities. Secondly, it must be considered from the spatial, temporal and its thermodynamic domains. In other words, as Kay and Schneider (1994) argue, people must come to terms with the fact that ecosystems are dynamic and unpredictable, and that they can be stressed.

Sustainable agricultural development is defined by the Federal-Provincial Agriculture Committee of Canada as "the Agri-food systems that are economically viable and meet society's need for safe and nutritious food, while conserving or enhancing ... natural resources and the quality of the environment for future generations." Tyrchniewicz and Wilson (1994) of the International Institute of Sustainable Development state that sustainable agriculture is both a philosophy and a system of farming. It is a philosophy

rooted in a set of values in society that reflect an awareness of both ecological and social realities that each society is facing. It is a concomitant commitment to respond appropriately to that awareness. While there are slight differences in emphasis in the way different people define the concept, the common objective is to foster a development that does not undermine natural processes but also meets the human needs for food and welfare. This is an important element because we are living in a fixed space with finite natural resources. In such a system, perpetual growth is ecologically impossible; only sustainable development is possible (Daly and Cobb, 1989). Sustainable development as used here means provision of quality services as opposed to growth which means quantitative supply. Quantitative growth beyond the carrying capacity of ecosystems is not only impossible but is also lethal to ecosystem health, beauty and permanency (Government of Canada, 1991). Holling (1990) expounded this aspect by pointing out that our usual management goals of maximum production, increased efficiency and reduced risk always result in loss in ecosystem resiliency.

Although the general sentiment of sustainable development as a development paradigm is commendable, it however has inherent problems. One of its most eminent inherent problems is the fact that it can mean different things to different people. As Slocombe (1992) argues, to some it could mean continued economic growth and resource exploitation but with controlled environmental impacts. To others it could mean fundamental changes in lifestyles, economies, and socio-political structures.

This vagueness in conceptual premise of sustainable development, leaves a great deal of room to manoeuvre (Vivian, 1991). Such that when governments introduce large-scale, revolutionary projects of the Thaba Bosiu Project magnitude they could actually argue that the underlying intent of their activities is to promote sustainable economic development at

both local and national levels. This study argues that projects that cause disruptions of the harmonious principles and values of society with the environment in favour of short term economic benefits are not only inappropriate but utterly unsustainable. The interdependence between the environment, human welfare and the economy needs to be realised in order for communities to manage their environment sustainably. It has to be realised that none of these parameters can be emphasised over others. They all must exist together for sustainable resource use into the distant future.

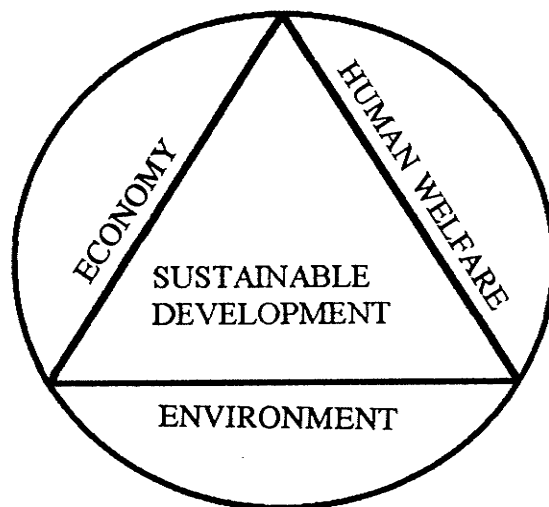


Figure 3: The Sustainable Development Model

Source: Manitoba Round Table on Environment and Economy

3.2 SOIL EROSION IN LESOTHO

3.2.1 PRECIPITATION AND EROSION

Precipitation in Lesotho is seasonal, with the rainy season normally starting in October and ending in April. Water erosion in the country shows a strong seasonal pattern too, which results mainly from a combination of a dry season, during which the soils dry out and the protective land cover deteriorates, and a subsequent wet season with high intensity storms. Summer is the time of strongest water erosion and precipitation is usually of the conventional type. During the wet season there are periods of greater or less erosion, depending on rainfall intensities and land management practices (Schimitz and Rooyani, 1987). Flannery (1977) enumerated the following land conditions conducive for soil erosion in Lesotho:

- 1) high intensity storms of the late spring months on the land fallowed for summer crops or burned pasture and range;
- 2) low moderate intensity rains of late summer or early autumn on saturated soil under fallow for winter crops, or on late summer crops whose growth is not good enough to provide adequate soil protection;
- 3) low intensity rains of mid autumn on land ready for planting or already planted to winter crops.

The land used for agricultural purposes in Lesotho consists of only a thin layer of soil with relatively impermeable layers underneath (Jayamaha, 1991). Thus even comparatively moderate rainfall intensities could exceed the soil water retention capacities and lead to

water-logging and local flooding. Furthermore, heavy rains do result in compaction of the soil forming a hard crust which causes problems for the farmers.

The impact of falling raindrops and hail pellets on soil, leading to the detachment and removal of soil particles, is an important form of erosion in Lesotho (Schimitz and Rooyani, 1987). How much damage results from rain splash depends on the amounts and intensities of the precipitation and on how sensitive the soils are to this type of erosion. As noted in the scientific literature, the factor which is most crucial in water erosion is the mean annual rainfall. Areas with a low annual rainfall experience little water erosion compared to areas with high annual rainfall. In Lesotho low annual rainfall is considered to be anything between zero and 500 millimetres while high annual rainfall comprises of any amounts beyond 500 millimetres.

3.2.2 EROSION PROCESSES AND FORMS

3.2.2.1 Sheet erosion

Sheet erosion is defined as the removal of thin layers of soil by water acting over the whole landscape (Troeh, Hobbs and Donahue, 1980). Water channels in this form of erosion if present are small and ill-defined and are usually not identifiable by air-photo interpretation (Schimitz and Rooyani, 198). However during this process, the most fertile part of the soil, the topsoil is washed away, and gradually, and unnoticeably, the fertility and productivity of the soil is reduced (Schimitz and Rooyani, 1987).

3.2.2.2 Rill erosion

SARCUSS as quoted in Schimitz and Rooyani (1987) defined rill erosion as "the removal of soil through the concentration of overland flow into numerous small, but conspicuous, channels or rivulets." As runoff concentrates on bare land surfaces such as footpaths, animal tracks, plough furrows and field boundaries sufficient soil may be removed to form a small rill. Continuous water flow on the rill over time widens and deepens the rill until it forms a large *donga*. As Schimitz and Rooyani (1987) explain the combination of rills and sheet erosion is the most destructive erosional process in Lesotho causing a loss in crop productivity.

3.2.2.3 *Donga* erosion

The word *donga* is a Southern African term used to refer to a gully or channel cut by running water. A *donga* is distinguished from a rill by the fact that it is so large and deep that it cannot be crossed or smoothed out by farm implements. Most *dongas* in Lesotho are either U-shaped or V-shaped, but several intermediate shapes also exist (Nordstrom, 1986). The shape depends on the resistance of the subsoil and on the process in action. According to Nordstrom (1986) U-shaped gullies form where the subsoil is deep and highly erodible. They usually have vertical or steep banks due to a collapse of the banks. The V-shaped *dongas* develop where the subsoil is relatively resistant to erosion (Nordstrom, 1986; Schimitz and Rooyani, 1987).

Soil erosion is mostly concentrated in the lowlands and foothills in Lesotho, and the influencing factors are the high density of human population, high density of associated road and track networks, urbanisation, villagisation and agricultural activities. According to

Schmitz and Rooyani (1987), 0.5 percent of Lesotho's land area has been gullied and 7 percent of arable land has already been lost to gullies. 25 percent of the existing land under the plough is so severely eroded that it has to be abandoned for rehabilitation (Schmitz and Rooyani, 1987). Of the present total arable land, 0.25 percent is lost annually as a result of erosion (Flannery, 1977) with the highest rate of erosion being experienced in the lowlands - 30 to 100 metric tonnes per annum. Using a bulk density of 1.6 g/cm^3 this translates to a total loss of about 25 centimetres of topsoil in 100 years, which far exceeds the normal rate of 12 centimetres over 100 years (Schmitz and Rooyani, 1987).

3.3 SUMMARY

Increased soil erosion and declining productivity in the past 50 years in Lesotho point to the fact that attempt to drastically revolutionise the country's small scale subsistence agriculture leads to unsustainable land management practices. As the Food and Agriculture Organisation publication, (The Conservation and Rehabilitation of African Lands: An International Scheme) explains, some of the fundamental problems why conservation and development projects have failed in various parts of the world, particularly in Africa, is that governments and donor agencies usually consider farmers to be part of the problem to be mitigated. Hence why, sentimental notions like "bad" or "primitive" farming methods have so much widespread usage in Lesotho. From the government's point of view traditional farming methods are primitive and therefore need to be changed. The government therefore has attempted on several accounts to transform the traditional farming system(s) of Lesotho in favour of mechanised agriculture with a hope that it will bring high production and thus reduce the country's dependence on the Republic of South Africa for food supply. A goal that should not be pursued at the expense of mining the country's soils causing a permanent long term problem.

CHAPTER FOUR



METHODS

4.1 LOCATION

The area of Thaba Bosiu has a long history of human occupation in Lesotho. It was in 1824 when the Basotho emigrated *en masse* to this area in search for a sanctuary against the *Lifaqane* wars which ravaged the entire southern African sub-region. They settled in Thaba Bosiu, and established it as the capital village and the besieged fortress for more than half a century (Germond, 1967; Damane, 1986; Machobane, 1991). It has been inhabited permanently ever since. It is here where the Basotho first came in contact with the Europeans when the missionaries first came in 1833. And it is also here where the Basotho began a transition from traditional peasantry to capitalist economy. In which pursuit, more virgin land was broken to expand arable farming and the produce sold in South Africa. The expansion of arable farming encroached into marginal lands, and the land available for pasture land was significantly reduced (Germond, 1967; Casalis, 1861). This led to severe environmental degradation in the area , and the country at large.

Therefore in its attempt to arrest this unprecedented environmental degradation problem in the area, the Thaba Bosiu Project embarked on the following activities:

- it terraced all the arable land;
- it built waterway channels to drain runoff;
- it built field access roads;

- it configured all fields to allow contour ploughing, and;
- it re-established vegetation cover in the area by planting tress, *kikuyu* grass, and *Eragrostis curvula*.

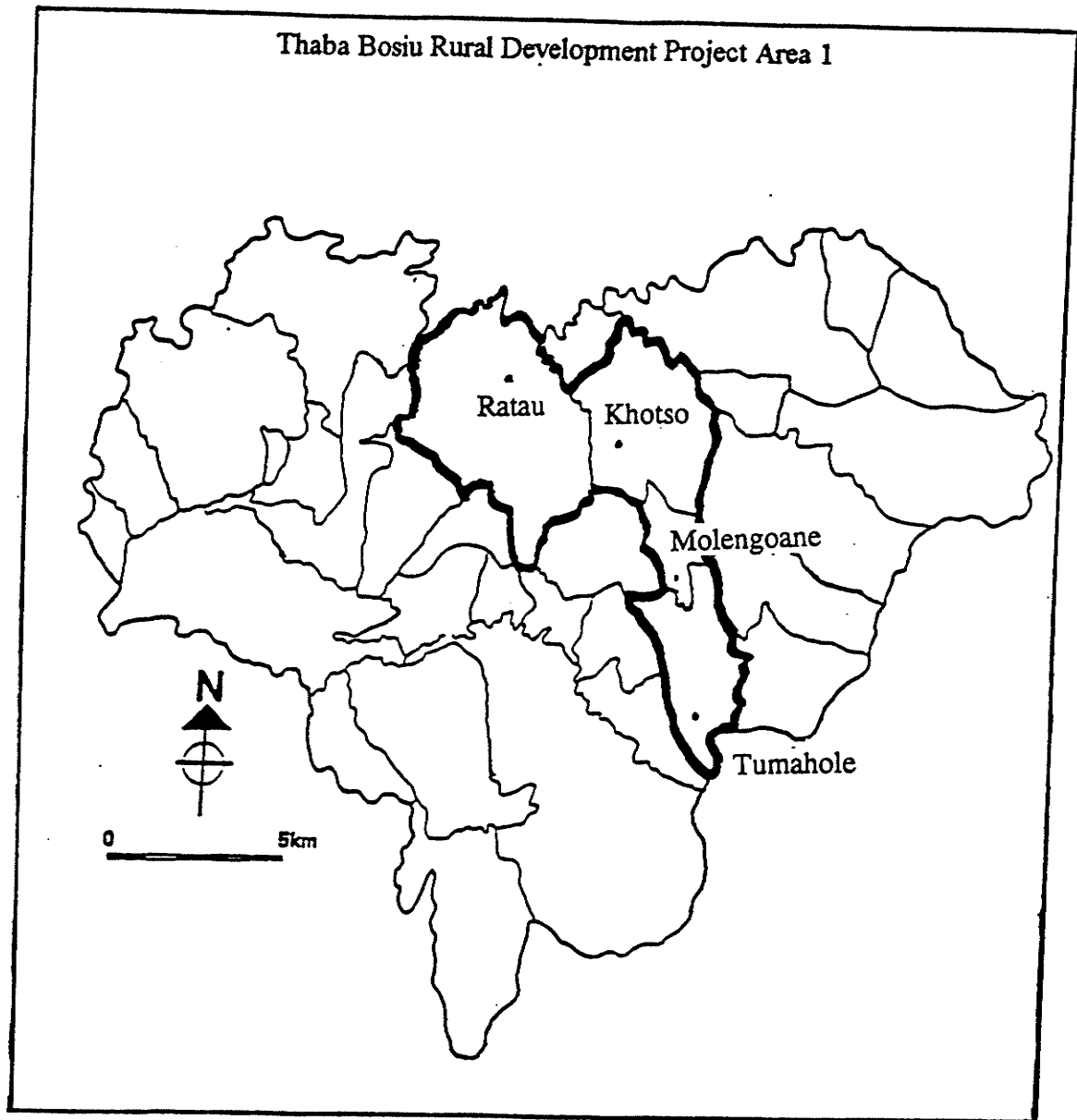


Figure 4: The location of the study area.

4.2 RESEARCH DESIGN

The study area was divided into four regions as depicted in Figures 4 and 5. This followed the boundaries of the area under each ward's chief jurisdiction as drawn by the Thaba Bosiu project in its land conservation maps. The regions are Ha Ratau, Ha Khotso, Ha Molengoane and Ha Tumahole. In each region, one village was selected to serve as the focal point of the region. This was done to minimise field costs and travel time between all sampled villages.

Pursuant to that, the majority of the interviews were conducted at these regional focal villages. In addition, the village of Ha Ratau, and to a limited degree its peripheral villages of Ha Sekete and Ha Mpao were selected to serve as the focal point of the entire study. This latter selection was underpinned by the fact that the village of Ha Ratau was the centre-stage of the Thaba Bosiu Project. It was in this village where a livestock station was established, a commercial cropping scheme was implemented, and where comprehensive conservation strategies were first initiated. Thus, the village of Ha Ratau was the principal anchorage of the project. It is also here where the most ambitious land reallocation programme was first begun by the project.

Given the purpose of the study and data requirements, the field work was divided into the following stages:

- field reconnaissance trips to survey the extent of environmental degradation in the area;
- unstructured interviews with the chiefs and the farmers, and;
- questionnaire guided interviews with both the chiefs and the farmers.

In total, 11 chiefs were interviewed representing 11 villages (see Figure 5), and 75 farmers were also interviewed most of whom coming from the villages of Ha Ratau, Ha Sekete and Ha Mpao.

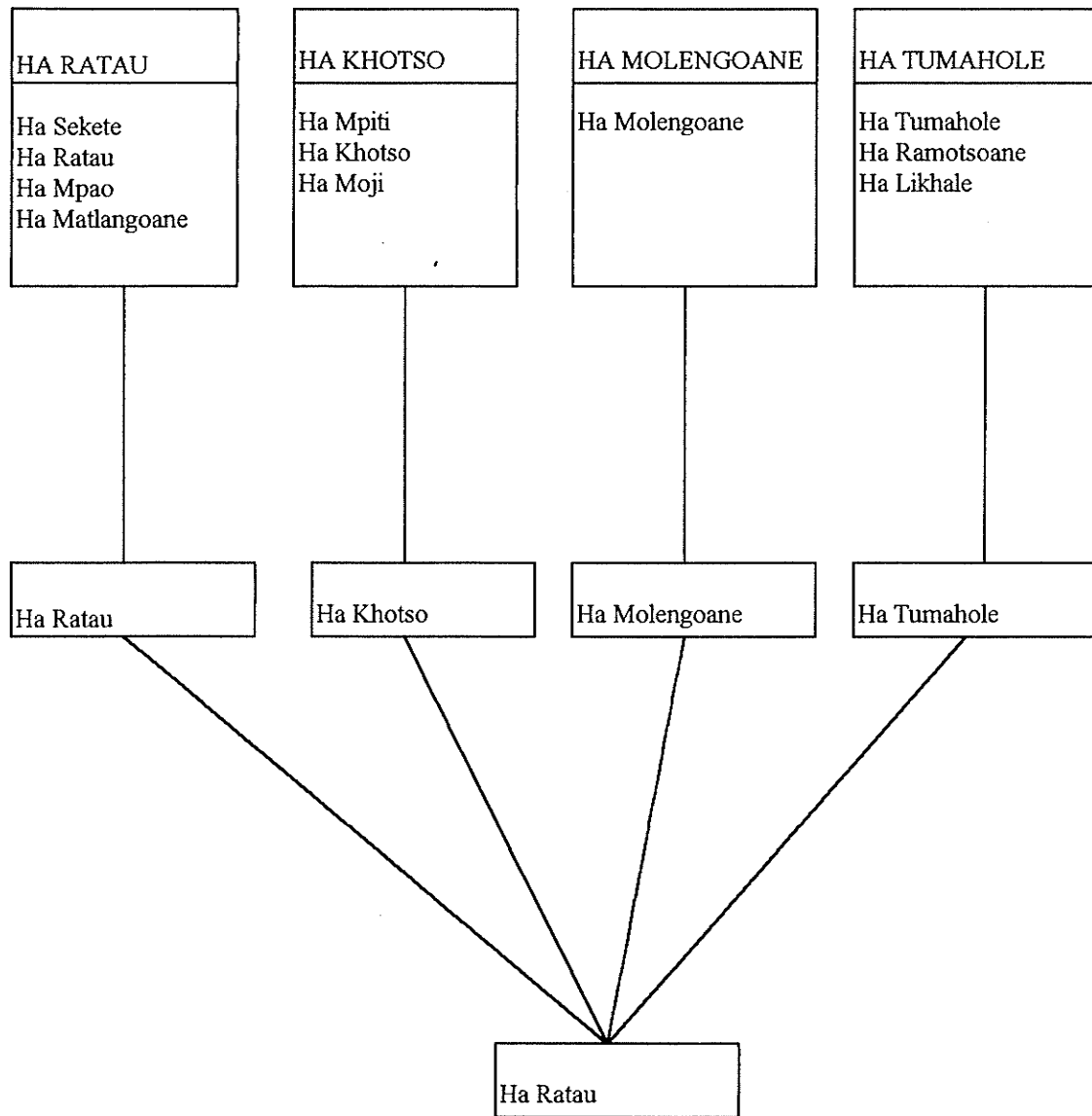


Figure 5: Four regional divisions of the study area - top caption. Second caption represents the four focus villages in each region, i.e. the places where most interviews were conducted. The last caption - Ha Ratau - is the focal point of the entire study.

4.3 INTERVIEWS AND QUESTIONNAIRE GUIDED DISCUSSIONS

Data collection was divided into two stages. The first was a round tour visit to all the chiefs (principal, ward and headmen) in the study area to introduce the study, and to request their co-operation during the course of the study. Once the study was introduced we progressed right away into the unstructured interviews in which the chiefs' views and perspectives were solicited regarding environmental degradation in their areas of jurisdiction. The interviews went on to explore the extent and causal factors. In all these discussions, open ended questions were posed to the chiefs, and they in turn recited their views, perspectives and experiences which were recorded on tape.

The second step in the first stage of data collection was interviews of the local people. Since one of the project's primary objectives was to improve farming skills and methods of the local farmers, the word "farmer" (*molemi*) was actually used in the interviews. This however does not imply "farmers" as understood in the western world. The word "farmer" is used euphemistically in Lesotho to refer to any adult person living in the countryside irrespective of whether he or she has a parcel of arable land. All countryside people consider themselves "farmers," and hence living on the land. During this phase only 20 farmers were interviewed, and they all came from the regional focal villages - about 5 from each region.

Then the second stage was the development of a detailed questionnaire to seek an in-depth inquiry into the issues that were raised in the first stage. The questionnaire consisted of a mixture of open ended and closed (yes and no) questions. The primary object of the questionnaire was simply to guide the discussions in a systematic manner and ensure that the same breadth of inquiry was undertaken with all respondents.

The underlying thesis for going through this two-phase investigation was to minimise imposing the researcher's own values, views and perspectives on the data collected by framing questions based purely on preconceived notions. It was strongly felt that the people best qualified to identify and shape the thrust of the study were the people of Thaba Bosiu.

The questionnaire was then administered to a total of 86 recorded farmers including all the chiefs in the area. But in reality, a lot more people participated in the discussions. In some neighbourhoods, neighbours just poured in and they were all given an opportunity to voice their opinions in open ended discussions. Since it would not have been possible to attribute any single opinion to any single person in these focus group discussions, no questionnaires were filled, however the discussions were taped. These are incorporated in the results of this study.

4.4 FIELD EXPERIENCE

Some difficulties were encountered during the field study the major impediment being time management. Although the people of Thaba Bosiu were extremely receptive and friendly, a substantial amount of time was spent establishing a rapport between the investigator and each respondent at the beginning of the interviews. This was considered necessary in order to dispel an immediate association of the investigator with the government. An atmosphere of friendship and openness was considered very important in order to obtain a truthful and a sincere perspective of the people of Thaba Bosiu. A three months field work can not claim to understand all the issues that plague the people in the study area. Nevertheless, their warm welcome and willingness to discuss them patiently provided an invaluable insight to the study.

The second impediment was absence of many farmers from home during the day. The field work was conducted during the Winter season, which is the harvesting and threshing time in Lesotho. So, most farmers were away from home during the day working in their fields, especially during the first month of the field work. This problem was overcome by beginning interviews very early in the mornings before people left for work, and also in the evenings when they were back. In July and August, most farmers were busy threshing and storing their produce, but they were kind enough to take time off from their busy schedules to participate in this study.

Because of these limitations, Saturdays were also used for interviews. Saturdays are used for burials, and for cultural and social festivities in Lesotho, as a result most people take time out from their duties in order to attend these occasions. Since the occasions usually start in the afternoons, the morning hours were used for interviews.

The final weeks of the field work were affected by a coup of the government, and the imposition of a dusk to dawn curfew which made evening interviews impossible. However, in spite of all these difficulties, the warm welcome and unconditional willingness of the people of Thaba Bosiu to readily participate in this study was able to carry it through.

CHAPTER FIVE



RESULTS

This chapter presents an analysis of the interviews conducted in Thaba Bosiu area in Winter (June to August) 1994. The thrust of the interviews was an investigation of the local peoples' views and perspectives regarding environmental degradation in the area; their views about the Thaba Bosiu Project and its activities, and their views about environmental conservation in the area. The results have been grouped together under the following headings:

- socioeconomic profile;
- sex, age and marital status;
- causes of environmental degradation;
- local view of conservation, and;
- local views about Thaba Bosiu Project.

5.1 THE DEMOGRAPHIC PROFILE

5.1.1 INCOME

Most families in this area are dependent primarily on three sources of income, namely: 1) wages from the South African mines, 2) income from livestock and livestock products, and 3) income from the sale of field produce (see Table 3). Although 17.1 percent of

respondents indicated that they get income from agriculture, this by no means implies on a yearly basis. What it simply means is that in a good year when yield is high, the surplus is sold and income is derived. But when yield is low, the produce is kept for family consumption. The basic rationale being to secure food supply.

Because the primary concern is food supply people are even willing to work for food-for-work payments. Food-for-work meaning that labourers are paid a certain quantity of basic foods - e.g. maize meal, beans, cooking oil, etc. for the labour provided. The acceptance of food-for-work is therefore indicative of insufficient food supply. Thaba Bosiu Project did use food-for-work payments also. The local people who worked for the Project were paid with food and not income. It can thus be argued that deriving income from sale of agricultural produce is contingent, it is contingent upon secure food supply. Farming is not practised as a primary source of income but as a means of livelihood. In fact, when asked why they are involved in farming, all respondents answered that it is to sustain themselves. Farming offers the only guaranteed pathway to food security; income derived is simply an added advantage.

As Table 3 shows the people in this area are dependent on diverse sources of livelihood. Income in the conventional form of wage employment is only a small part of their livelihood.

Table 3: Reported Sources of Income²

	PRIMARY SOURCES	RESPONDENT %	OTHER MEMBER(S) OF THE HOUSEHOLD %	TOTAL %
WAGE EMPLOYMENT	Wages from the mines	7.3	30.9	38.2
	Wages from RSA (not mines)	3.6	--	3.6
	Government employment	5.5	12.7	18.2
	Teacher	3.6	--	3.6
	Wages from local manufacturing firms	--	10.9	14.5
INFORMAL (NON-WAGE) EMPLOYMENT	Asparagus	14.5	--	14.5
	Sale of local brew (<i>joala</i>)	9.0	--	9.0
	Weeding labour	10.1	--	10.1
	Nanny	--	10.9	10.9
	Handicrafts	1.8	5.5	9.1
	Livestock	7.3	9.0	16.3
	Livestock products e. g. wool & mohair	5.5	7.3	12.8
	Field produce: maize, sorghum, beans, peas, etc.	17.1	9.1	26.2
	Shop or local cafe	--	5.5	5.5
	Chieftainship	5.5	--	5.5
	Road construction	3.6	--	3.6
	No reported income	5.6	--	5.6

²The numbers in the Table must be read horizontally not vertically. Each row represents a proportion of respondents out of the total sample which depends on that particular source.

A cumulative percentage of 26.2 percent of respondents indicated that from time to time, they do get income from field produce, with 9.1 percent getting it usually from their relatives. This goes to the heart of the social structure in the Sesotho society, and perhaps other societies which utilise the extended family for support. As the data in Table 3 shows, the respondents are not only depending on their own derived income, but also on support from relatives. There is also a significant sharing between and among neighbours in the village. Thus the community as a functional entity in Lesotho is not confined to the physical political boundaries between villages, but is a human-centred entity. Even those people who work and live beyond the political boundaries still consider themselves, and are also considered by the community, as the members of the community. They contribute to the health and vitality of the community through kinship relationships and flow of resources. They share their income with relatives in the community, who in turn, share with them their livestock and produce from the fields.

With respect to livestock Basotho in general do not sell their animals, except under conditions of dire need, particularly cattle because of their importance in survival. Other animals, especially sheep and goats are more readily sold. Their wool and mohair are annually sold generating some income to the households. In addition to ploughing, cattle are used in most cultural festivities - during funeral services, for bridewealth (*bohali*), and during all major social functions. Historically, cattle were used to epitomise wealth. The more cattle one had, the more wealthy he was considered to be by the community. But practically this is disappearing. Generally people no longer have large herds of cattle. However, because of their central role in Sesotho society, cattle are still the most beloved animals to Basotho.

As Table 3 shows the people of Thaba Bosiu like all others in the rural areas in Lesotho are depending predominantly on non-wage (informal) livelihoods with remittances from the mines. Their heavy reliance on remittances from the mines as a source of income means that most men between the ages of 18 and 60 work in South Africa as migrant workers leaving Lesotho with *de facto* female headed households. The result, is that, management of natural resources in the country is left with women and elderly men. Consequently, the ability of society to effectively manage its resources is impaired. Yet again the income from the mines is required to purchase inputs and implements for agricultural purpose. Without that income the ability of most households to farm would also be significantly impaired. Therefore there is a dynamic symbiotic relationship between the country's migratory labour system and agriculture which is the mainstay of rural households. As a consequence, the livelihoods of the rural people in Lesotho are directly tied to events in South Africa. The current mass retrenchment which began in the late 1980s due to a drop in gold prices, and the changing political climate in South Africa, are instructive in this regard.

5.1.2 SEX, AGE AND MARITAL STATUS

Figure 6 below shows the sex ratio and age distribution of the respondents. As the Figure shows, the majority of the respondents were women, beyond the age of 36. And as explained above this could be due to the fact that most men in this age range work away from home as migrant workers.

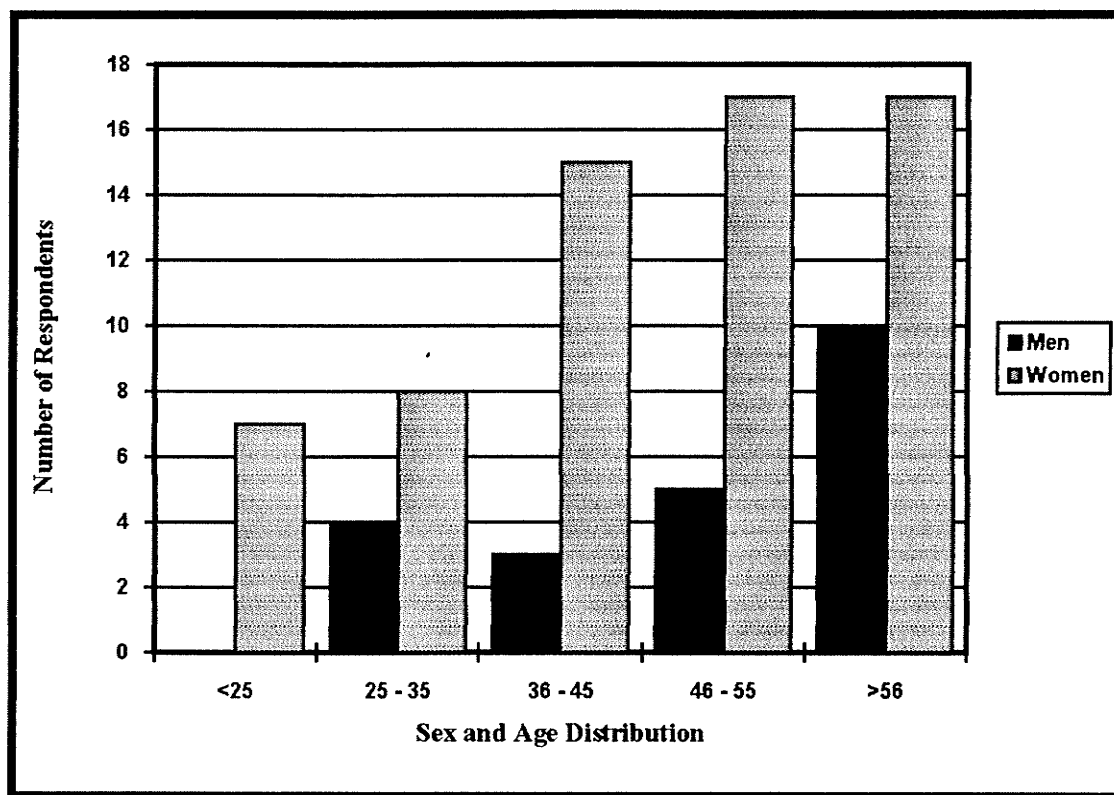


Figure 6: Sex and Age distribution of respondents

Of the 86 people interviewed in this study, 26 percent were men and 74 percent were women (see Figure 6). And as the Table shows, most of the men interviewed were beyond 56 years of age, and had been retrenched from the mines. 71 percent of the respondents were married, and 20 percent, the second largest group were widowed (see Figure 7).

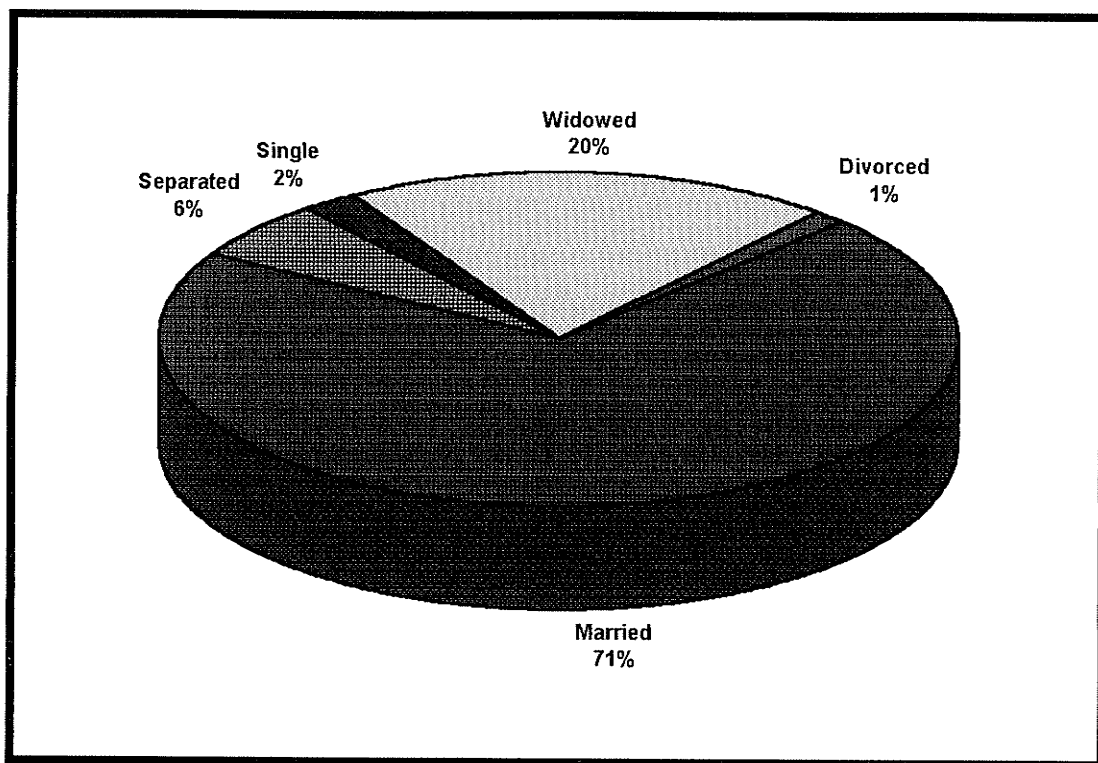


Figure 7: Marital Status of respondents

5.1.3 HOUSEHOLD SIZE AND ARABLE LAND HOLDINGS

Although most of the households surveyed lacked wage (formal) employment, a substantial number of them had very large families. 34 percent had families with seven or more members and 51 percent had families with four to six members (see Table 4 below). The average household size among the respondents was found to be 5.96. Meaning that each household had on average six members. This is consistent with what is reported in the literature about households in poverty stricken conditions. The literature suggests that most families in poor living conditions tend to have large families since children are required to assist for survival.

Moreover, since there is no form of social welfare for old age in Lesotho, children act as insurance for the future for the parents. They also play an important role in household activities. Boys are required to take care of the animals and plough the fields and at maturity to go to the mines and support family with remittances from the mines. Girls on the other hand are required to assist women in all other household chores; such as fuelwood gathering, fetching water for the household, taking care of the children, cooking, and so on. In the absence of any real income, the role of children in day to day survival of rural households in Lesotho can not be underestimated.

Table 4: The Number of People in each Household

NUMBER OF PEOPLE IN THE HOUSEHOLD	PERCENTAGE OF HOUSEHOLDS
Two or fewer	7
Three	8
Four	15
Five	20
Six	16
Seven	6
Eight	9
Nine	8
Ten or more	11

The reality is that most of the families that subsist predominantly on agriculture in Lesotho are extremely poor. Nevertheless, in the absence of employment opportunities for them, land is the single most important asset that they own. Investment in it, whether with just time taken working on it and endurance to work for long hours with limited tools for very little production marks an incredible sense of responsibility. Being able to produce something for their families by themselves with no external assistance epitomises the ultimate stewardship for a people whose lives are riddled with perennial hardships. Amidst all these difficulties, in general most rural Basotho are very proud to be farmers. Farming to then does not simply mean what is obtained at the end of the harvesting period, but it embodies a sense of belonging. It is an expression of dignity and pride to be a Mosotho. It is an expression of commitment to family and community. And devotion of one's energy and resources to that commitment. Thus in Sesotho culture farming defines a Mosotho, and defines the country of Lesotho. This viewpoint was challenged by Sechaba Consultants (1994) in their report when they said:

"Clearly the myth that Lesotho is an agricultural country dependent on its traditional resources of fields and livestock is just that - a myth. Owning these traditional resources is a privilege of the poor.... If a wealthy person in the traditional sense, is a person who owns fields and livestock, it would seem a curse rather than a blessing."

But as argued above, the act of farming is not only confined to how much output is obtained but defines the culture of Basotho, the history of Basotho, the social fabric of Sesotho society, and pride for being a Mosotho. Agriculture is cemented into the tapestry of Sesotho society. Even the people who do not derive their lives directly from the land still empathise with farming and cultural attachment to land. All this can not be dismissed solely on the basis of amount of production obtained. Clearly production is necessary because it

provides food security. But it is not an end in itself but a means of survival. It is a goal that should be pursued still keeping in mind all the other social and spiritual values of farming and ownership of land to Basotho.

As mentioned in the preceding chapters, historically all households were allocated three diminutive fields for subsistence in Lesotho. But as population pressure increased this equitable land holding changed and land was acquired by inheritance. Progressively it was fragmented with each successive generation between the members of the family. And landlessness, particularly rural landlessness began to rise. It is currently estimated at 38 percent (Matlosa, 1993). As Figure 8 shows, some respondents only have one field, and some do not have fields at all and are engaged in share-cropping. Most of the people that are involved in share-cropping either have land and no resources or do not have land but have resources e.g. implements or some income, usually from the mines. The two groups come together on an individual basis and share-crop for mutual benefit. Decisions pertaining to the arrangement are usually discussed before hand and are based on a consensus of the parties involved. This includes decisions such as the time to plough, which crop to plant, who is going to weed, and so on. The owner of the land usually providing land and labour, and the other partner providing inputs and labour.

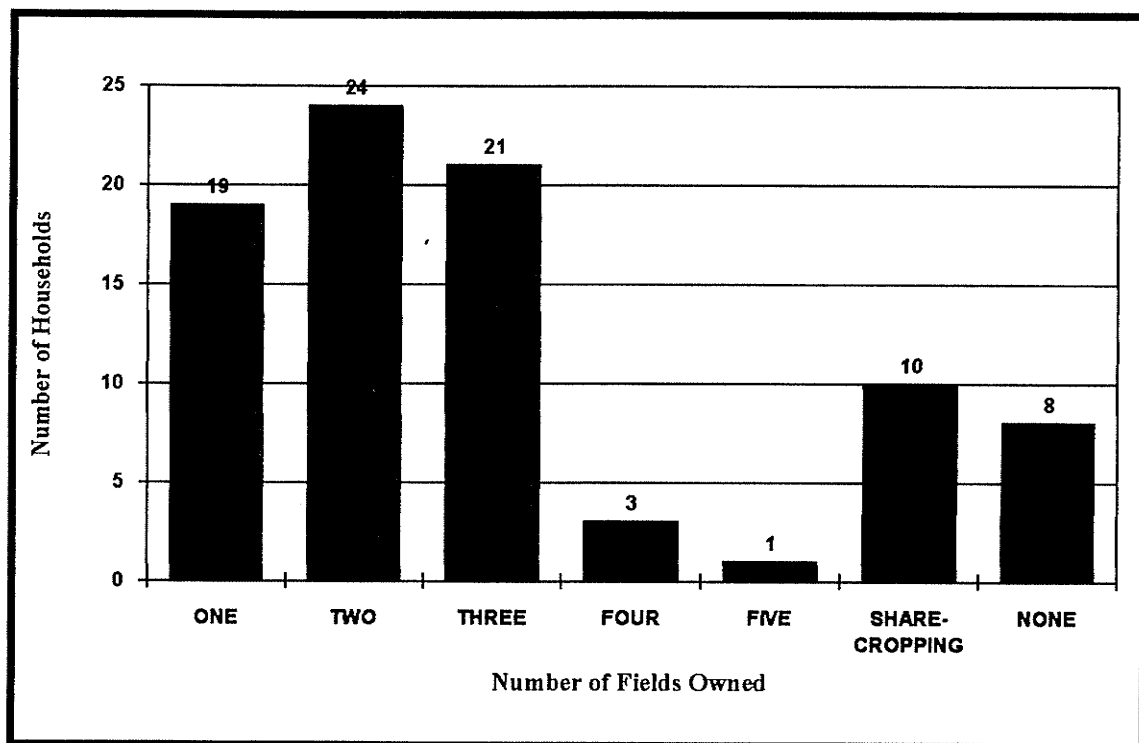


Figure 8: Number of field holdings per household in Thaba Bosiu area

5.2 CAUSES OF ENVIRONMENTAL DEGRADATION

The existence of extensive environmental degradation in Lesotho has already been mentioned in the preceding chapters. And the fact that despite a long history of conservation works Lesotho continues to suffer from severe degradation. The official view of the government and local and international intelligentsia is that it is the primitive methods of earning a livelihood of the rural Basotho that is accentuating the problem. The situation is further compounded by the high erodibility of most soils in the lowlands. According to Schimitz and Rooyani (1987) most of the lowlands zone comprises of the duplex soils which are highly erodible. The term duplex connoting that the soil is made of two distinct storeys. The upper storey is highly permeable and absorbs water readily. The lower storey on the other hand has low permeability and prevents water penetration. Thus, when it rains the upper storey gets saturated with water resulting in local flooding and water-logging. This in turn leads to capillary action between the two storeys and subsurface lateral movement of the water along the capillary. Over time this subsurface water tunnelling creates a hollow space between the storeys, and the upper layer collapses under its own weight forming a *donga*.

The thrust of this study was however to investigate anthropogenic causes of environmental degradation in the study area over and above the above mentioned physical causes. It needs to be said that according to Basotho's traditional ecological knowledge, biophysical environmental degradation of the magnitude that is seen now in the country never existed more than a century ago. According to this orally transmitted knowledge, Lesotho was boasting of flourishing populations of wildlife, expansive vegetation cover, and sustainable livelihoods. The journals of the missionaries also talk of large populations of wildlife, a

diversity of species, dense and tall vegetation, and an industrial nation (Casalis, 1861; Germond, 1967; Eldredge, 1985).

Today there are very few wild animals except a few species of birds some of which are already threatened. The country is criss-crossed by *dongas*, indigenous woodlands are extirpated, and most people can no longer make a living on the land and it has become imperative to depend on income from the South African mines. Those who fail to get employment find themselves living on the virtual brink of destitution. The real question becomes: what has changed that could have caused this dramatic transformation in just a matter of one century? The answer lies in the general observation that the per capita standards of living of rural people across the world is regressing. And that poverty in these people has forced them to engage in certain coping strategies to sustain themselves. And that in some cases they have to degrade their environment in order to make ends meet.

Figure 9 gives an overview of causes of soil erosion in Lesotho according to respondents. With the exception of wind, drought and rain, all the other causes are tied to day to day livelihoods of the respondents. For instance, downslope ploughing refers specifically to a practice known as *bent-acre* in Lesotho. This refers to a downward ploughing along the extreme edges of a field. Since most fields are aligned across the slope, and are separated by a narrow strip of un-ploughed land, most farmers plough up-and-down the slope along the edges to avoid depredation of adjacent fields' crops by animals pulling the plough. *Likhatampi* (singular *khatampi*) on the other hand refer to places where women extract earth for plastering their houses. Most houses are built with mud, and are periodically plastered for maintenance and beauty. These areas if not protected act as erosion hotspots during the rainy season.

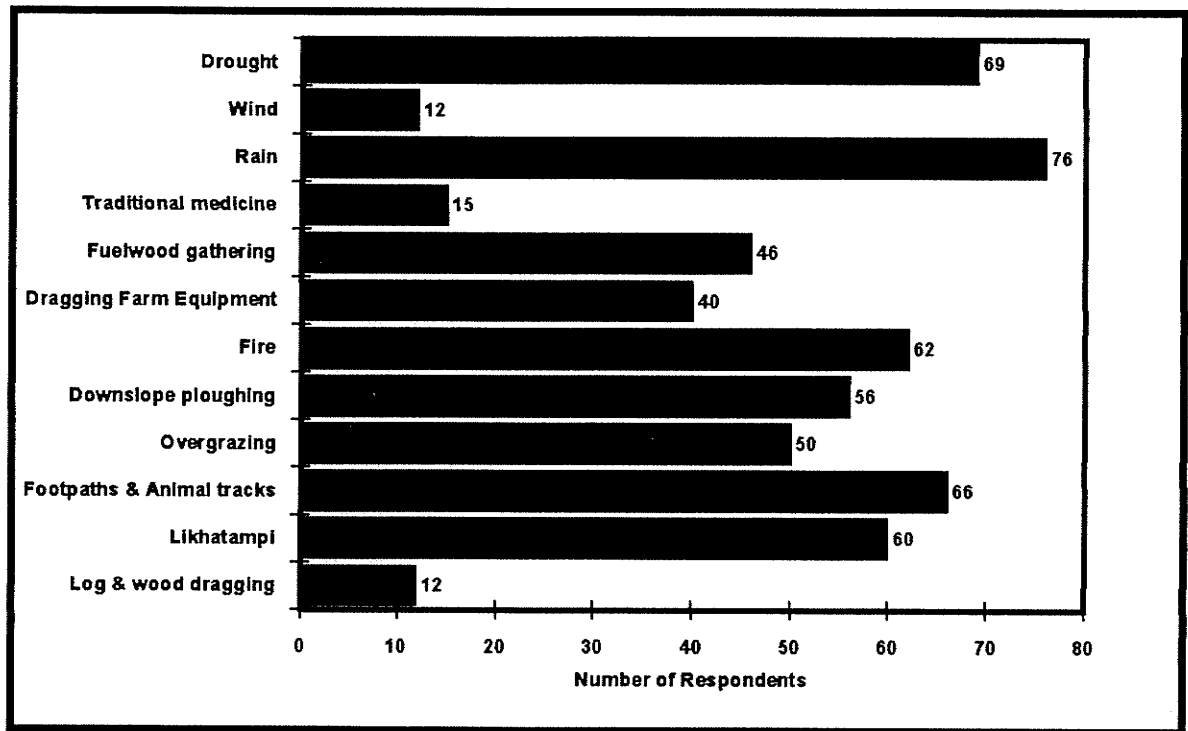


Figure 9: Causes of environmental degradation in the area according to respondents

As Figure 9 shows, most respondents are aware of the impact of these activities on their environment. Although in the questionnaire they were asked specifically about soil erosion, inclusion of such factors as fuelwood gathering and traditional medicine shows that Basotho's conception of soil erosion is not just limited to the physical detachment of soil

particles but to the underlying causes of that physical detachment. 76 out of 86 respondents noted that rain was the major cause of soil erosion which is consistent with the literature. Traditional doctors dig certain herbs which they use to treat their patients. Since they concentrate on certain species, they sometimes result in local depletion of some species. In addition, some of these plants exist in rocky and highly erodible places. Yet they still dig them out, resulting in those areas acting as erosion hotspots.

Table 5 separates some of these major identified anthropogenic causes of environmental degradation activities by the causal agents. As the Table depicts, women are more involved in collection of fuelwood and extraction of plastering earth, farmers in agricultural activities such as downslope ploughing and overgrazing, herdboys in overgrazing and seasonal burning of rangelands, and communities in footpaths, wood dragging, and so on.

With respect to fuelwood collection, women in Lesotho often have to walk long distances to collect it since peripheral areas around the villages are usually the first to be denuded. Furthermore, because of heavy reliance on fuelwood as a source of energy for cooking and for heating the homesteads, indigenous woodlands and shrubs have been heavily stressed and are diminishing. As a result, animal dung and crop residues are also used for domestic energy (see Plates 4, 5 and 6).

Thus, instead of recycling the nutrients back to the soil they are taken away. In Winter after harvesting, all arable land is opened to communal stubble grazing (see Plate 7). And the women follow the animals to collect both the stubble and the animal dung for domestic use. This results in an ostensible net flow of carbon and nutrients from the fields. This practice over a long period of time is bound to result in nutrient deficiency in the soil.



Plate 4: Women carrying animal dung for domestic fuel



Plate 5: A bunch of stubble collected for domestic fuel



Plate 6: A woman cooking with stubble fuel



Plate 7: Cattle grazing on stubble



Plate 8: Active erosion at Thaba Bosiu



Plate 9: Active erosion, and overgrazed mountain slopes

In terms of overgrazing, specific reference was made by some respondents, especially men to the fact that sheep and goats are more destructive than cattle. Cattle's major impact is depredation with their hooves leading to detachment of soil particles. While sheep and goats are major defoliators. They damage the vegetation by removal of most aboveground growth of vegetation. Heady (1984) noted that the most important responses of plants to grazing are to intensity, frequency, seasonality, and selectivity of defoliation. Intensity meaning the degree to which plant herbage has been removed. In addition, O'Connor and Pickett (1992) observed in their study in South Africa that high intensity grazing characteristic of sheep and goats caused local extinction of *Themeda triandra* and *Heteropogon contortus*, two palatable species to livestock, and are replaced by *Aristida bipartita*, an unpalatable species characteristic of most stressed rangelands in southern Africa. This confirms the respondents observation that sheep and goats have a significant impact on environmental degradation in Lesotho, especially rangelands degradation.

Herdboys are involved in seasonal burning of rangelands to promote spring regrowth. This is an old practice in Lesotho. More than a century ago, travellers in the country described a widespread use of fire to manage rangelands. The practice is now being condemned by the government arguing that it exacerbates the country's environmental degradation problem. Nevertheless, it is ecologically sensible to short-circuit the nutrients entrapped in dead vegetation to make them readily available for regeneration. Blanket condemnation of this practice simply demonstrates our lack of understanding on the role of fire in maintaining grassland ecosystems.

Table 5: Anthropogenic Causes of Environmental Degradation in Thaba Bosiu

	CAUSAL AGENTS OF DEGRADATION			
FACTORS	FARMERS	HERDBOYS	WOMEN	COMMUNITY
Log and wood dragging	♣			♣♣♣♣♣
Likhatampi (extraction areas for plastering earth)			♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣	
Footpaths and animal tracks	♣	♣♣		♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣
Overgrazing	♣♣♣♣♣♣♣♣ ♣♣	♣♣♣♣♣♣♣♣ ♣♣♣♣		♣♣♣
Downslope ploughing	♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣			
Burning grazing areas for spring regrowth	♣♣♣	♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣		♣♣
Dragging sledges and other farming implements	♣♣♣♣♣♣♣♣ ♣♣♣			♣♣♣♣♣♣♣♣ ♣
Fuelwood gathering			♣♣♣♣♣♣♣♣ ♣♣♣♣♣♣♣♣ ♣♣♣	♣♣♣♣

Note: Each symbol denotes two people's responses

Fire is a natural phenomenon in grassland ecosystems. Sterwart and Tiessen (1990) report that lightning fires periodically burned these ecosystems before they were inhabited by agricultural communities. The same practice was later continued by the primitive man to maintain grasslands for range purposes.

5.3 THE LOCAL VIEW OF CONSERVATION

Conservation as a concept is usually defined broadly to mean "wise use." Walker (1987) defined it as "a tool," a management tool that is designed to ensure harmony between the environment and human beings. He argues that conservation is not just a by-product of some invincible legal process, but rather a by-product of human or community development. Thus conservation is not about the environment *per se* but about the interplay between the environment and humanity. And therefore by definition conservation can not be authentic if it excludes human beings.

This reality was long ago recognised by indigenous communities around the world. They have always used their environment with care. For centuries, these communities succeeded to balance their subsistence needs with the health and vitality of their ecosystems. For example, the pre-historic Basotho were successful farmers because they were good conservationists. Their practices of shifting cultivation and transient populations allowed ecosystems to bounce back after stress. Furthermore, their practice of *mafisa*, *maboella* and *meraka* avoided localised stresses of the rangelands (see Table 6).

Maboella is the local rotational system of animals. Under *maboella* some parts of the communal grazing lands are closed to grazing by the community and vegetation allowed to

recuperate. Compliance is enforced by the community itself. Livestock caught grazing in closed areas is fined heavily, and the owner talked into respecting communal property.

The second system of grazing - *meraka* - is the seasonal migration of animals to the animal posts far into the Maluti³ hinterland for summer grazing. This is done to prevent damage to crops by livestock during the growing season. And also to allow the rangelands to rejuvenate. The animals come back in Winter to graze on stubble. Compliance in this regard is also enforced by the communities themselves.

To these Basotho conservation was a way of life and not an ideology. It was predicated on impassioned need for survival not on ideological exactitude.

Another example is the conservation of forest resources by the Penan people of Malaysia. The Penan view the forest as an intricate web of relationships of which they are a part. The forest provides them with food, medicine, clothing, shelter, and spirituality (Davis, 1993). As they say, "From the forest, we get our life" (Davis, 1993). Exemplary of their conservation ethic is the *molong* concept. According to Davis (1993), *molong* is climbing a tree to harvest the large fronds of the rattan leaving smaller shoots so they may reach maturity in the subsequent years. And marking that tree with a small cut on the stem to signal to other users that it has already been harvested therefore has to be preserved future use (Davis, 1993).

Yet this culture was challenged by "civilisation." The cultural imperialism of the western societies brought an euphemism of "nature conservation" which considered humanity at a remove. The result, at least in Africa, was a plethora of national parks and afforestation

³ Maluti is a term that refers to the mountains in Lesotho.

areas that were closed off to the local communities. Thus nature conservation to these communities represented a loss of land, and an impact on their livelihoods. In contrast, Walker (1987) suggested that sustainable livelihoods, characteristic of the ones mentioned above, should form the impetus of our development and conservation paradigms. For as he said, "If livelihoods are sustainable, then by definition, nature is safe from earth's most powerful predator."

There are however some cultural values and traditional practices which were used to conserve the environment that have been lost (see Table 6). Some, such as shifting cultivation, were necessitated by scarcity of arable land. Some were a result of diminishing community cohesion, and loss of respect for traditional institutions. These include the abandonment of traditional work parties (*matsema*), disappearance of strong local authority, and diminishing community stewardship. It could be argued that the cause is the westernization of Basotho. Their assimilation into the global economy, and their adoption of its values.

Table 6: Cultural practices and values that have an impact on the environment as identified by the respondents

<p>I</p> <p>CULTURAL PRACTICES AND VALUES THAT DEGRADE THE ENVIRONMENT</p>	<ul style="list-style-type: none"> ➤ the use of sledges ➤ dragging farm implements <i>en route</i> to the fields ➤ downslope ploughing especially along field edges ➤ gathering plant residues for fuel ➤ use of stubble for fuel ➤ footpaths and animal tracks ➤ seasonal burning of rangelands ➤ <i>Likhatampi</i> (extraction areas for plastering earth) ➤ overgrazing by animals ➤ high use of fuelwood at traditional initiation schools ➤ burning of initiation areas at the close of initiation ➤ over-harvesting of shrubs and herbs for traditional medicine ➤ over-harvesting of rare and endangered animals and birds for traditional medicine
<p>II</p> <p>CULTURAL PRACTICES AND VALUES THAT CONSERVE THE ENVIRONMENT</p>	<ul style="list-style-type: none"> ➤ <i>maboella</i> (traditional system of rotating grazing areas) ➤ planting trees ➤ <i>ho upella sefako</i> (defusing hailstorms using traditional medicine); reduces soil erosion ➤ contour ploughing ➤ <i>meraka</i> (seasonal migration of animals to animal posts for summer grazing) ➤ chiefs and elders overseeing protection of local resources ➤ nutrient restoration by stubble grazing ➤ use of scattered parcels of land for cultivation
<p>III</p> <p>LOST CULTURAL PRACTICES AND VALUES WHICH USED TO CONSERVE THE ENVIRONMENT</p>	<ul style="list-style-type: none"> ➤ hand casting of seeds during planting ➤ shifting cultivation ➤ crop rotation ➤ planting aloes ➤ communal work parties ➤ community stewardship ➤ respect for community institutions ➤ community unity and cohesiveness ➤ strong local traditional authority ➤ <i>mafisa</i> (communal sharing system in which wealthy animal owners loaned some of their animals to the poor to use and take care of.)

5.4 LOCAL VIEWS ABOUT THABA BOSIU PROJECT

Likewise the people of Thaba Bosiu were asked their own views about conservation in the area. About how they thought future interventions ought to be shaped in order to ensure sustainability of the results. Table 8 presents these views. The Table deals specifically with the question of conservation intervention similar to Thaba Bosiu Project i.e. land reclamation. As the Table shows, people recognise that for large scale conservation attempts of that magnitude, the government must be involved. But it must not have the monopoly of power. According to the farmers, the intervention must be co-managed by all stakeholders, with the recipient communities playing a major role. The government must provide expertise which is complimentary to the traditional knowledge. Where necessary, the government must also provide equipment and financial resources. But ultimately the process must be driven by the people, the communities whose lives depend directly on the resources being rehabilitated. That would serve to empower them, and enable them to realise their full potentials. If the situation is repressive and imperialistic, the local communities would be victimised and impoverished. As Walker (1987) says, "a strategy of conservation is futile, therefore, unless it embraces a strategy for human settlements." Because any policy reforms that are not culturally sensitive are bound to fail.

Table 7: Suggested division of responsibility for land rehabilitation in Lesotho

Who is responsible?	What should be done?
THE GOVERNMENT	<ul style="list-style-type: none"> ➤ provide extension services ➤ provide specialists ➤ provide equipment for reclamation ➤ provide financial assistance ➤ terrace all the fields ➤ provide tree seedlings ➤ provide grasses for conservation e.g. <i>kikuyu</i> grass ➤ enact laws protecting rehabilitated lands ➤ enact laws protecting fragile lands ➤ institute conservation projects
THE COMMUNITY	<ul style="list-style-type: none"> ➤ community members should work more co-operatively ➤ revive traditional work parties (<i>matsema</i>) ➤ people should plant trees ➤ vegetate eroded lands ➤ construct diversion furrows ➤ build embankment dams ➤ build stone walls in <i>dongas</i> ➤ stop burning rangelands ➤ control grazing pressure ➤ revitalise traditional grazing systems
THE CHIEFS AND LOCAL VILLAGE DEVELOPMENT COUNCILS	<ul style="list-style-type: none"> ➤ take leadership in organising communal co-operatives ➤ enforce community compliance ➤ manage grazing areas ➤ oversee protection of local resources ➤ seek financial assistance for community
FARMERS	<ul style="list-style-type: none"> ➤ practice contour ploughing ➤ reclaim <i>dongas</i> and rills on their fields ➤ maintain grass cover on terraces ➤ maintain grass cover in waterway channels ➤ vegetate denuded terraces and waterways ➤ maintain conservation structures on fields ➤ plant trees ➤ control grazing pressure on fields ➤ stop dragging farming equipment across conservation structures and along routes to the fields

For the purpose of this study, this was contrasted with what the Thaba Bosiu Project did in the area (see Tables 8 and 9 below). That is, did the Project incorporate the needs and wants of the people of Thaba Bosiu? In pursuance of this issue, the respondents were asked specifically to answer the following questions:

- 1) whether they considered the way the Project was implemented satisfactory?
- 2) whether they felt that it had improved their farming skills?
- 3) whether they felt that it improved their conservation knowledge? and,
- 4) whether as a result of the Project they had changed their farming techniques?

The answers to these questions were a resounding "NO," and the reasons for that are given in Table 9.

Table 8: Respondents evaluation of Thaba Bosiu Project

Question	Answer	% of Respondents
Was the way the Project implemented satisfactory?	No	77
Did it improve your farming skills?	No	84
Did it improve your conservation knowledge?	No	69
Has it changed the way you farm?	No	96

Table 9: Reasons why Thaba Bosiu Project was not successful according respondents

- it did not originate from the local communities
- it did not involve the local people in its management
- it did not incorporate the needs and wants of the local people
- it was too capital intensive
- it lacked public consultation
- it lacked public participation
- it had differential personnel policy
- it had no training component for local farmers (would-be beneficiaries)
- it dispossessed and disenfranchised local people
- it undermined Basotho's traditional cultural attachment to land
- it appropriated some farmers' land for a commercial livestock centre
- its land realignment programme caused a major social disruption

Of the interviewed people, 77 percent felt that the way the Project was implemented and administered was not satisfactory because the local communities had no ownership of the Project. As they say, "it was the government thing." It did not address their own priorities and needs. They were not involved, except as labourers. And even its personnel policies were discriminatory to them. They were hired on a three-week rotation, and paid with food-for-work, which was way below minimum wage. All the other government personnel were paid with cash, and had secure employment. Obviously, the idea of differential treatment between and among government officials was not fair.

The people however were appreciative of the fact that mechanical structures were built to protect their land. They were appreciative of a network of field roads that were built in the area. But were disappointed that there was no follow-up to maintain the structures. From its reports, Thaba Bosiu Project expected the communities to shoulder the post-project

phase by themselves. But there was no institutional framework developed to carry it out, and there was no liaison established between the relevant government department(s) and the communities. Further more, there was no post-project funding available to the communities. As a result, there is no maintenance done, and the structures are beginning to collapse (see Plates 10 and 11).



Plate 10: Collapsed gabion structures at Ha Ratau



Plate 11: Footpaths and active erosion at Ha Ratau

CHAPTER SIX



DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

6.1 DISCUSSION

As the results of this study show, there are several causes of environmental degradation in Lesotho. They range from day-to-day activities of the rural people, such as, animal keeping, fuelwood collection, collection of traditional medicine, to natural occurrences such as drought and erratic rainfall. The high recurrence of drought and depletion of vegetation cover as a result of overgrazing and overexploitation of indigenous fuelwood resources are invariably key causes of the present situation in Lesotho. This depletion of vegetation cover, coupled with the high erodible nature of Lesotho's duplex soils and the rugged terrain provide a conducive environment for water erosion during the rainy season. It has been mentioned that Lesotho consists of 75 percent mountains, most of which are highly overgrazed resulting in less water penetration and hence increased overland flow. This in turn causes soil erosion. Small rills are formed which develop into *dongas* overtime.

The data also show that there are traditional systems and institutions that Basotho have used for a long time to deal with environmental management. Examples include the use of *mafisa*, *meraka* and *maboella*, and the use of *matsema* and extensive kinship relationships to control and manage access to natural resources, and finally strong local authority and community stewardship. All these were important systems aimed at avoiding depletion of natural resources and maintaining community cohesion.

From the data provided in this study it is also evident that the cause of the unprecedented environmental degradation problem in Lesotho is not limited to activities of the rural people as is usually believed. But that the problem also finds its way into government policy, the institutional flaws, land tenure system, rapid population growth and the widespread poverty in the country. The classical view that environmental degradation is caused by what has been referred to a "primitive" methods of earning a livelihood of the rural Basotho simply does not address the problem adequately. It focuses on a narrow spectrum while the problem is much larger. Since the problem is usually conceived narrowly as soil erosion or overgrazing the remedial measures taken are also utopian and insufficient. Thaba Bosiu Project is an example of such government endeavours.

The Project was conceived and implemented with no public participation. It established token Conservation Committees which had no power at all but were simply used as a link between the Project and the community, their sole responsibility being to transmit the Project policy and propaganda to the communities. It should, however, be noted that public participation does not necessarily lead to empowerment and equity. Empowerment and equity are practical concepts that have far reaching implications. They require fundamental changes in the manner in which we do business if the local people and the underprivileged are to participate equally in a development process. They require fundamental changes in the country's institutions, legal framework, economic system, political system and the attitude of the people who run all those bureaucracies. They require that ideas originate from the bottom i.e. the grassroots and be transmitted up, and not the converse.

Lele (1991) noted that there are several types of participation: 1) is participation in decision making; 2) participation in implementation; 3) participation in benefit distribution; and 4)

participation in evaluation. The question then becomes which of these types of participation is required to address adequately the complex issue of environmental degradation in Lesotho? The disposition of this study is that all of them are necessary. Because of the immense nature of the problem, if any measure of success has to be achieved at all, work must be done by the rural poor in their thousands.

The communities must organise themselves and work together towards a similar vision of the future. But a conducive policy climate must be developed for them to realise and exercise their potential. Repressive and insensitive policies that adversely affect the social fabric of the communities must be given due consideration because unity is required and co-operation should be the norm. And as this study argues, Basotho can learn something from their traditional knowledge instead of dismissing it as primitive. For example, the consensus based decision making that used to be a mode of operation in all community matters, the traditional work parties, the traditional grazing systems which are managed by the communities, the widespread practice of planting trees and aloes, and the utmost respect for communal property.

All these are valuable assets that could still be used to revitalise the community spirit and stewardship in the rural areas in Lesotho. Besides, the word "primitive" itself is relative: i.e. primitive relative to what? For example, it is now known that monocropping leads to impoverishment of the soil if practised over an extended period. Yet when it was introduced it was considered progressive. Basotho's practice of mixed farming and shifting cultivation may have seemed primitive to European observers in the 19th century but they were sensible ecological measures. This is a body of knowledge that needs to be revitalised and adapted accordingly.

Going through the results of this study it becomes evident that the major impediment in the contemporary *modus operandi* in Lesotho is the fact that the rural poor are considered the problem and the sole causes of environmental degradation, and all attempts are aimed at changing them through extension services and development projects. Unfortunately this approach misses the major issues: 1) The fact that public policy plays a role in causing environmental degradation in Lesotho; 2) That lack of facilities to the rural people plays a role in causing environmental degradation in the country; 3) That poverty plays a role in causing environmental degradation in the country.

These are complex issues that are beyond the control of the rural people and fall into the realm of public policy and economic development. The present approach shifts the blame from the dominant players i.e. the policy makers, financial institutions and development experts and puts it on defenceless poor. The poor then become scapegoats of injudicious development attempts by the development organisation. And their refusal to capitulate to these injudicious policies is labelled as ignorance and paranoia in order to justify even stiffer policies.

The current debate on land privatisation in Lesotho is instructive in this regard. It is being argued that farmers are underutilising the land because they earn alternative income from the mines. Hence, the land should be availed to those who would utilise it optimally. Obviously this issue is much more complex than that. It has been argued in this study that income from the mines is required for agriculture in Lesotho, and is complimentary to others livelihood methods of the rural people. Taking the land away from them will have a significant impact on their welfare. It is used to buy inputs and implements. Without it farming would be adversely impacted in Lesotho.

The rural people utilise the land in various different ways such as stubble grazing, collection of crop residues for domestic fuel and collection of wild vegetables. All these options may be closed to them by privatising the land.

6.2 THE BROADER CAUSES OF ENVIRONMENTAL DEGRADATION

These broader causes of environmental degradation have been grouped together under the following headings:

- policy induced environmental degradation;
 - institutional flaws;
 - land tenure system;
 - population, and;
 - poverty.
-
- Policy induced environmental degradation:

It appears the assimilation of the country's political economy into market economy has resulted in some culturally insensitive developments and policies. Examples include the land re-allocation policy of the Thaba Bosiu Project, the grazing fees, the establishment of the woodlots, and the relentless ridiculing of local breeds of cattle. The common feature in all these cases is the insensitivity of the government policy to the feelings, values, and aspirations of the people. With respect to land re-allocation by Thaba Bosiu Project, there was no proper consultation to ensure that the affected people understood clearly what was involved and accepted to bare the consequences of the undertaking. The decision was

simply based on its scientific validity. The result was a major social disruption which led to court proceedings between and among community members after the Project left. People were battling over field boundaries as they tried to return to their original fields.

Yet even today almost 15 years after the fact the situation has not been fully resolved. The Project planted a seed for community feud and never mitigated it. There are still cases pending in the courts of law.

The government woodlots are often established in areas that the communities use for pasture land. After being established, animals are no longer allowed to graze in them, and the wood becomes the property of the government which is sold at a monetary price. Thus shifting ownership of the resource from the community to State. The result of that in addition to losing ownership is that available rangeland shrinks resulting in more concentration of animals and hence overgrazing.

Another important aspect is the lack of services to the rural people. There is no unemployment insurance in Lesotho, there is no old age security, and there are few in-country job opportunities. People with low education simply have to seek opportunities in South Africa as migrant workers, which of course has profound implications for their long term benefits. Thus in a nutshell the political and economic systems in Lesotho are simply not responsive to the needs and wants of the rural people. Even when they attempt to respond they fail to adapt to the cultural and social environments of Lesotho's countryside.

- Institutional flaws:

There is a growing lack of respect for traditional institutions, and indigenous knowledge in the country. As the traditional institutions die, so is the community spirit of sharing and oneness. The motivation no longer becomes community stewardship but profit maximisation. As one respondent said, "the major crisis in our society is lack of love. The Basotho people no longer have love."

Although there are Village Development Councils, according to the respondents there is still no reciprocal flow of information and power between the general populace and the government. The people, especially the rural people are left out, not understood, unable to articulate their needs, and largely marginalised in policy formulation.

- Land tenure system:

Much has been written about lack of security provided by Lesotho's customary tenure (see Matlosa, 1993), and the solution prescribed by many is privatisation. The respondents conceded to the problem of lack of security but could not recommend privatisation. They expressed confusion as to who is responsible for what in land management in Lesotho. That is, what are the rights of chiefs? What are the rights of the government?. Most importantly, what are the rights of the general populace? Nonetheless, there was a consensus of opinion on the general ownership of land: that it belonged to the entire nation, the problems only coming from its management. This follows up directly from problems mentioned above about institutional problems.

Attempts to bring together the chieftainship and new methods of local governance based on Village Development Councils according to the respondents are not working very well. The majority of the respondents felt that these institutions are unproductive.

It is thus evident that the land tenure system must be reformed, the only lingering question is how? The summation of this study was that the people would prefer stronger and more empowered local authority. More participation in decision making and allowed to shape their own vision of the future. Whether that should be based on revitalisation of the traditional institutions i.e. the chieftainship, village work parties or more empowered Village Development Councils is a subject that should be further investigated. Privatisation should be considered as one of the alternatives, not as the only solution.

- Population:

The population in Lesotho is estimated to be growing at about 2.6 percent (Sechaba Consultants, 1994) per year, and it is projected to reach over two million by the turn of the century. What the respondents pointed out was the overcrowding and increasing landlessness in their area. Since land is inherited from family, it becomes continually fragmented as it is handed down through generations. Yet again the respondents pointed out that they need the children to help them in survival. Having children is not a trivial issue, and is certainly not limited to survival driven agenda. There are many different reasons why people want to have children. Nevertheless there is a linkage between population and resources. And when those resources are in short supply, further growth contributes to their overexploitation.

- Poverty:

The study contends that there is a dialectical relationship between poverty and environmental degradation. It argues that as poverty accentuates environmental degradation, environmental degradation in turn accentuates poverty. The relationship is however complex and dynamic as Lele (1991) presented in Figure 10. Lele (1991) argued in this paper that unfortunately the mainstream views the relationship between poverty and environmental degradation in a linear fashion, thus missing the broader picture. From the responses given by the respondents it became apparent that poverty had a hand in their activities. Many realise that some of their activities have adverse environmental impacts e.g. overgrazing and overuse of fuelwood resources, but do not have any other options.

The statistics provided by Jazairy *et al.* (1992) in their study of world poverty, indicated that 81 percent of the population in Lesotho lived in the rural areas in 1988, and of those, 55 percent were living below the poverty line. Whereas the concept of head count poverty line does not encompass all the livelihood variables, it can still be useful to show a trend. Assuming that the poverty line estimate is reasonable, 55 percent of the rural population (81 percent) living below the poverty line in Lesotho translates to 749, 000 people out of a total population of 1, 676, 000 using 1988 statistics. That means that one in every two people in the country is living below the poverty line.

The widespread environmental degradation in the country is the symptom of this problem. It is not the root of the problem, but a symptom, a symptom of a more engendered social malaise.

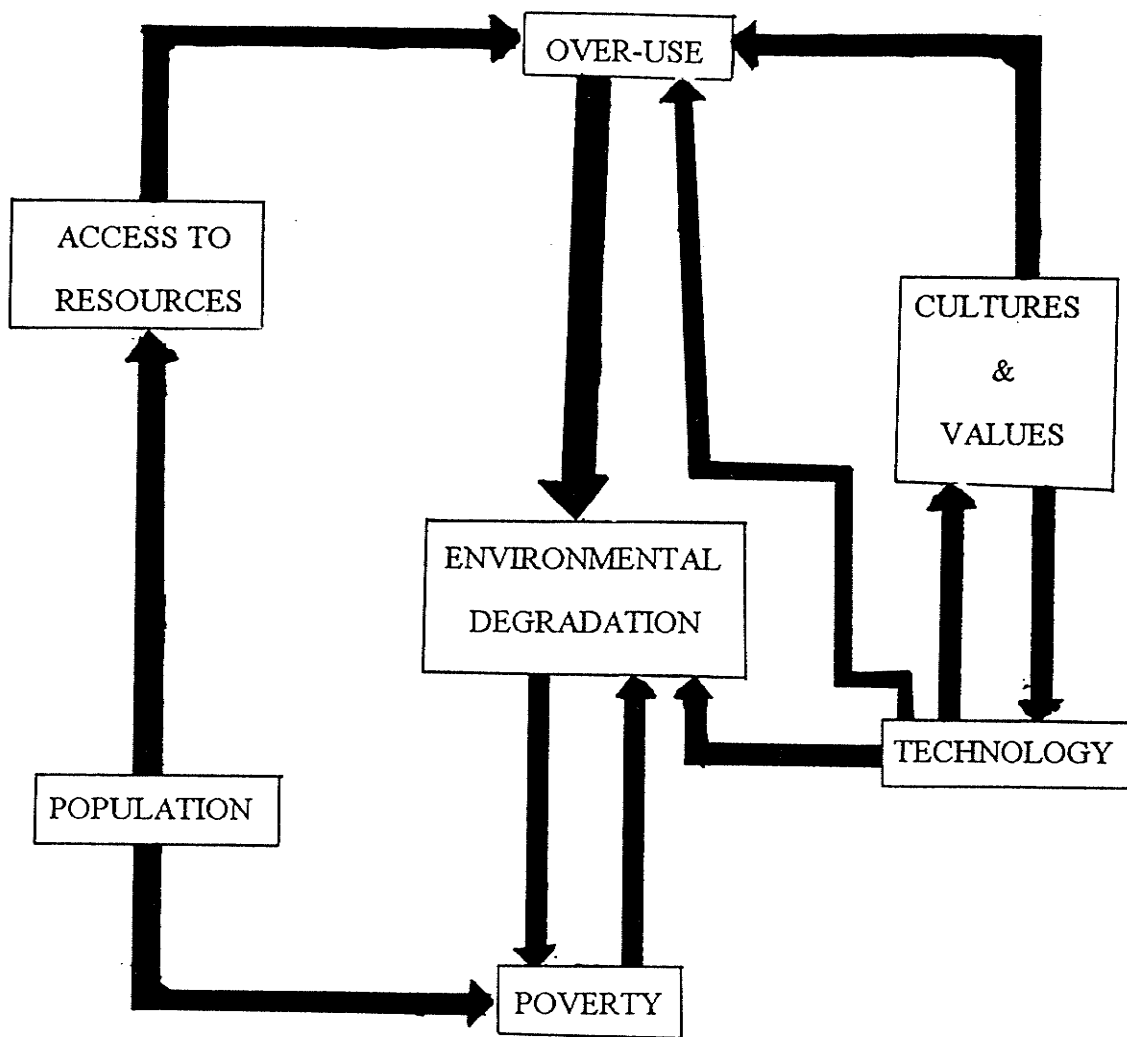


Figure 10: A schematic showing a relationship between the multiple causes of environmental degradation.

6.3 CONCLUSIONS

From the results of this study the following conclusions are drawn:

1. That according to the respondents, environmental degradation in Lesotho is caused by both natural and anthropogenic factors. The principal natural mechanisms being high intensity rainfall and drought. With respect to anthropogenic causes, the primary causes are a myriad of footpaths devoid of vegetation linking villages which develop into *dongas*, downslope ploughing, seasonal burning of rangelands, *likhatampi* and overgrazing.
2. Thaba Bosiu Project was able to reclaim some land that had been rendered derelict by environmental degradation. But it was not successful in securing sustainable conservation in the Thaba Bosiu area, the reasons for that according to the farmers, include *inter alia*, the fact that, it did not incorporate their needs and traditional systems of mitigating environmental degradation in its activities.
3. The respondents view of sustainable conservation in the area is a shared responsibility between the local authority and the communities, and the government. A co-management system which is operationalised by partnership groups within the communities, and between the communities and the government. In which pursuit, day-to-day management of the commons would be delegated to communities with the government providing technical assistance and other forms of assistance when necessary. In order for that to succeed, the communities have to revitalise community stewardship and resuscitate the spirit of communitarianism.

4. Lack of employment opportunities and other means of sustainable livelihoods in the country have resulted in the establishment of a migratory labour system which results in prolonged absence of men from their communities, thus undermining the traditional resource management systems. Since Lesotho is a patriarchal society, the management of natural resources, in particular the commons, was the responsibility of men. A situation which has been delegated to elderly men by the migrant labour system.
5. The causes of environmental degradation in Lesotho are broad and far reaching, and they extend into various sectors of the country's social structure. The principal mechanisms being poverty, government policy, institutional flaws, rapid population growth and the land tenure system. The farmers, the out spoken villains according to the government, are simply participants in a much broader social problem in the country.

The rural people who subsist for the most part on the land have been propelled by these endemic social maladies to adopt coping strategies that are destructive to the environment. These include over-exploitation of fuelwood resources leading to acute deficiency and denudation of indigenous shrubs, harvesting of stubble and other plant residues, and use of animal dung for domestic fuel. These result in a net flow of organic carbon and nutrients from arable land.

6. While the system is showing signs of breaking down, it is important to note that there were, and still are to a limited degree, a set of traditional institutions and regulations which governed the use and management of natural resources. These systems were based on consensus decision making and equitable distribution of resources. Moreover, there were institutional mechanisms designed to avoid or minimise absolute poverty in

the communities. It was the responsibility of each individual in the community to take care of the underprivileged. As a result, there was extensive sharing between and among community members thus engendering a strong spirit of communitarianism.

6.4 RECOMMENDATIONS

6.4.1 BROAD RECOMMENDATIONS

1. A paradigm aimed at redressing this situation by advocating for a people-centred, and ecologically sustainable development process was proposed by the Brundtland Commission in 1987 - the sustainable development paradigm. As said in chapter three, although the concept may mean different things to different people depending on their initial disposition, it is an umbrella concept that brings together people with hitherto fundamental perspectives in the environment-development debate to search for a common ground, for common objectives and agenda. It also provides an operational framework within which various parties can participate in a development process. Therefore, the principal recommendation of this study is that in order to address its pervasive environmental degradation problem, Lesotho needs to implement a sustainable development programme with the following four operational principles:

- Empowerment
- Equity
- Partnerships
- Livelihood security.

- Empowerment: The wholesale failure of development projects in Lesotho, and other developing countries indicates that if environmental degradation mitigation has to be successful, and have long lasting results the process must involve and be driven by the local people themselves. For as Gow, (1992) says, “environmental degradation is not a problem of relationships between people and their habitats, but of relationships among people...” It is important therefore that the process of mitigation be people-driven rather than purely “environment or nature-driven.” Because in reality what matters is not so much the environment but the livelihood of the people depending on that environment. Humans are interwoven into the whole tapestry of life and the environment provides a substrate, a cradle, a home for that life. If environmental degradation has to be sufficiently addressed, then the general populace, particularly the rural poor whose lives depend directly on that environment must have a say in the decision making process.
- Equity: In order for the system to work it must be participatory and all-inclusive, and there has to be accountability of all the parties concerned. The process has to ensure that all are treated equally and have equal opportunity in receiving the ensuing benefits of the resources in their area. It has been indicated that in accordance with the land tenure in Lesotho, natural resources are held in common by the society, but with the declining communitarianism these commons are likely to end up in the tragedy of the commons situation. Equity requires that a communal fabric be revitalised to ensure that the resources are managed sustainably for the benefit of all.
- Partnerships: This study recommends partnerships between the government and the communities leading to co-management of resources, and between the proponents of new development undertakings and the communities in order to ensure sustainability of

future development and conservation projects, so that the benefits could trickle down to everyone. The local people must be involved from the conception of an undertaking through its implementation. They must be equal participants in the process. In that regard, they would bring into the process traditional knowledge which would be complimentary to conventional scientific wisdom. But most importantly, they would feel the sense of ownership of the process and strive to maintain it for long term sustainability. Partnerships in the communities should also be established. Groups with common interests should come together for the common good and should pull resources together to achieve that common vision.

- Livelihood security: The notion of livelihood security attempts to weave together ecological imperatives, social and economic requirements of the communities. It is a system whereby communities meet their basic needs without degrading the future potential of the environment. Therefore, livelihood security is based upon the prudent stewardship of the communities in resource management. It is thus recommended that the sustainable development approach implemented in Lesotho be based on livelihood security.

1.

2. Lesotho may consider enacting an "Environment Act" and/or a "Sustainable Development Act." While there are *ad hoc* environmental and social impact assessments that have been undertaken in the country, there is no legal requirement obliging developments to undergo impact assessment at all. The country only has a policy statement published in the National Environmental Action Plan in 1989 which reads, "the proponent shall be required to undertake prior environmental assessment of the proposed activities which may significantly affect the environment or natural resources" (Government of Lesotho, 1989). There are no guidelines developed to assist

in implementing even that policy statement. It is therefore, important that an "Environment Act" be developed spelling out clearly the involvement of the public in the process, from screening, to scoping and hearings. Such an Act will ensure that the people are given an opportunity to articulate their needs, views, perspectives, and aspirations and be assured that their input will be given due consideration. In addition, such an Act will give the communities a leverage to challenge the validity and valuability of any development.

6.4.2 SPECIFIC RECOMMENDATIONS

1. Attempts should be made to revitalise traditional institutions and practices that promote conservation, such as, the *maboella*, *meraka* and *mafisa*. In addition, they may consider putting in place policies that enable individual households to have more control over natural resources in their custodian. Both the institutions and the policies should be adapted to addressing the needs of the present without compromising the health and vitality of the environment, and should be dynamic reflecting the changing times.
2. Instead of privatising the commons more control should be given to local communities, and those rights should be enshrined in law. The government should provide complementary expertise to assist the communities to manage the commons sustainably and enterprise on them for the common good. Equity, partnerships and livelihood security must be the cornerstones of such communal enterprises.

3. There are anecdotal data on the severity of environmental degradation in Lesotho. The government must embark on a comprehensive countrywide evaluation of the situation and document it in the state of environment reporting.
4. Lesotho needs to control its population growth in order to reduce the demand on its natural resources capital. As the schematic drawn in Figure 10 shows population is an important consideration in resource allocation and consumption. The current estimated 2.6 percent annual growth in the country is too high to be sustainable. Arable land has shrunk from 15 percent to 9 percent in a period of less than 100 years, and the reasons for that include among others environmental degradation, urbanisation and villagisation. It is thus imperative therefore, for Basotho as a society to begin to address these imperious social realities.
5. More research is needed to understand how the identified systemic causes influence environmental degradation in the country.

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APPENDIX A

ENVIRONMENTAL DEGRADATION IN LESOTHO: A RETROSPECTIVE ANALYSIS OF THE THABA BOSIU PROJECT

Hello,

My name is Taelo Letsela from the Institute of Southern African Studies at the National University of Lesotho. I am currently studying in the Natural Resources Institute at the University of Manitoba, and the questionnaire you are cordially requested to take a few minutes of your time to fill is part of my studies in the same Institute. You are therefore requested to fill it truthfully as the information contained herein will be treated with the strictest confidence and shall be used only for the purpose of this study.

Thanking you in advance for your anticipated co-operation,

Taelo Letsela.

HOUSEHOLD PROFILE

1. Village: _____
2. Gender of the respondent: [Male] [Female]
3. Age: _____
4. Marital Status: i) Single: _____ ii) Married: _____
iii) Separated _____ iv) Divorced: _____
v) Widowed: _____
5. Occupation of the respondent: _____

6. Occupation of the head of the household _____

7. Other sources of household income: Tick all applicable answers below:-

Migrant worker(s) wages	
Locally employed (specify where)	
Income from farming	
Other (specify)	

8. How many people live in this household? _____

9. How many fields does the household have? _____

10. Describe the soil type in each field: _____

11. Why are you involved in farming?

12a. Do you engage in intercropping? [Yes] [No]

12b. If yes, what combinations of crops do you normally use for each field:

13. Why do you exercise intercropping? please explain:

14. Which is the most valuable soil overall in each of your fields?

Field 1:

Field 2:

Field 3:

15. Who weeds the fields?

16. Who does the other farming chores?

ENVIRONMENTAL DEGRADATION

17. What are the causes of soil erosion?

18. What is the role of farmers in causing soil erosion?

19. What is the role of herdboys in causing soil erosion?

20. What is the role of women in causing soil erosion?

21. What is the role of community in causing soil erosion?

22a. Do you think there is a relationship between soil erosion and production?

[Yes] [No]

22b. If yes, what is it?

23a. If soil erosion has to be controlled then, who should control it?

23b. How? —————

24. What is the role of farmers in mitigating the problem?

25. What is the role of government in mitigating the problem?

26a. Do you consider the use of projects appropriate in containing the problem?

[Yes] [No]

26b. Elaborate

27a. Do you consider TBRDP to have mitigated the problem sufficiently?

[Yes] [No]

27b. Why?

28a. If you were the implementor of TBRDP, what would you have done differently?

28b. Why?

29a. What would you maintain?

29b. Why? _____

30a. Did you consider the way this project was implemented satisfactory?
[Yes] [No]

30b. Why? _____

31a. Do you think TBRDP added to your farming techniques?
[Yes] [No]

31b. Elaborate: _____

32a. Do you think it has improved your soil conservation knowledge?
[Yes] [No]

32b. Elaborate: _____

33a. Has that changed the way you farm?
[Yes] [No]

33b. How? _____

34a. In your opinion is there is a relationship between cultural values and traditional practices and environmental degradation? [Yes] [No]

34b. If yes what is it? _____

35a. Do you think Basotho still maintain some cultural values and traditional practices that degrade the environment? [Yes] [No]

35b. If yes which ones: _____

36a. Do you think Basotho still maintain some cultural values and traditional practices that conserve the environment? [Yes] [No]

36b. If yes which ones: _____

37a. Do you think they have lost some values and practices that conserved the environment? [Yes] [No]

37b. If yes which ones: _____

LAND TENURE

38. What is the role of the King in land management?

39. What is the role of the chiefs?

40. What is the role of the government?

41. Who owns land in Lesotho?

42. Who is responsible for its management?

43. What is your role in land management?

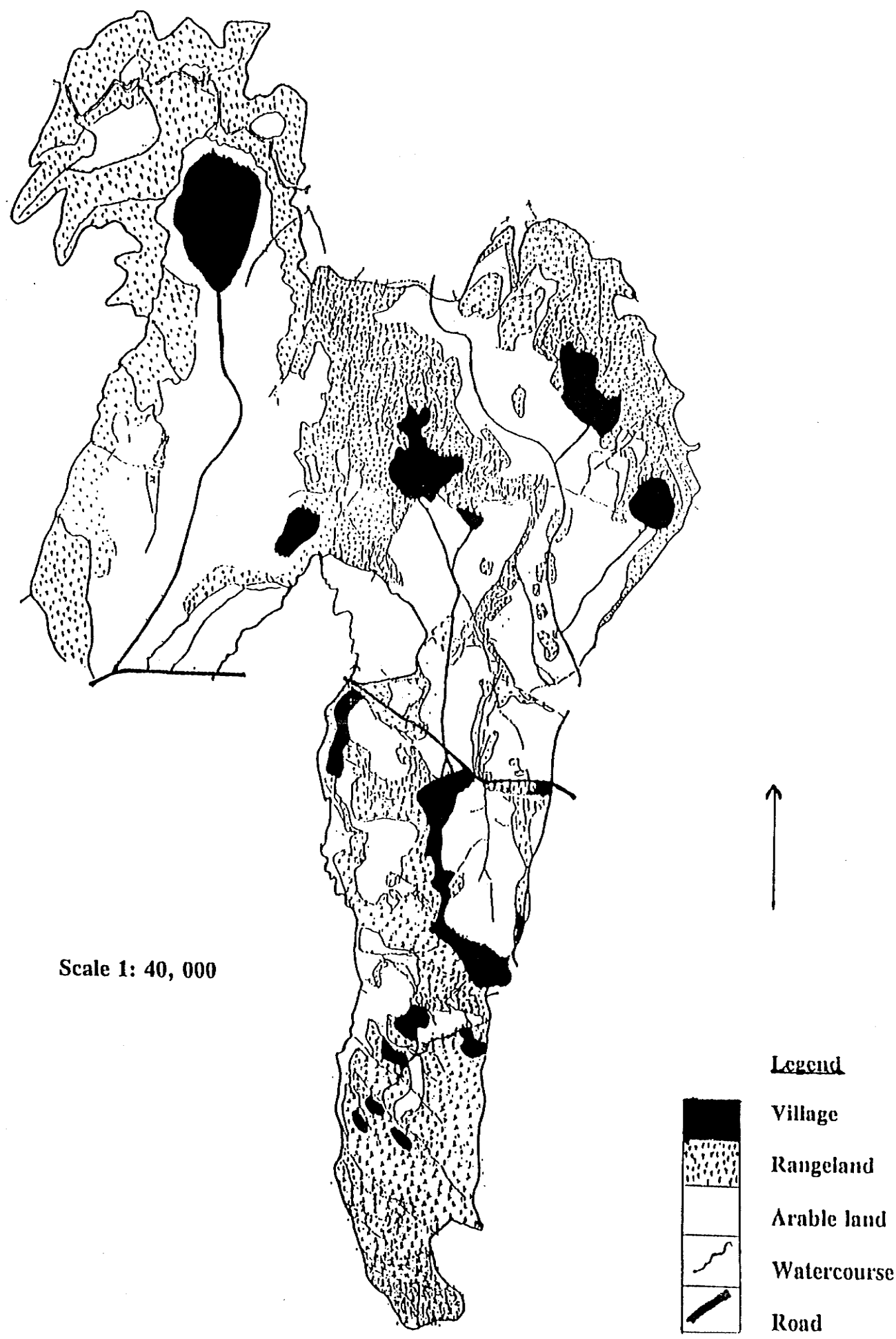
44a. In your opinion does the present land tenure system play a role in environmental degradation?

[Yes] [No]

44b. Elaborate: _____

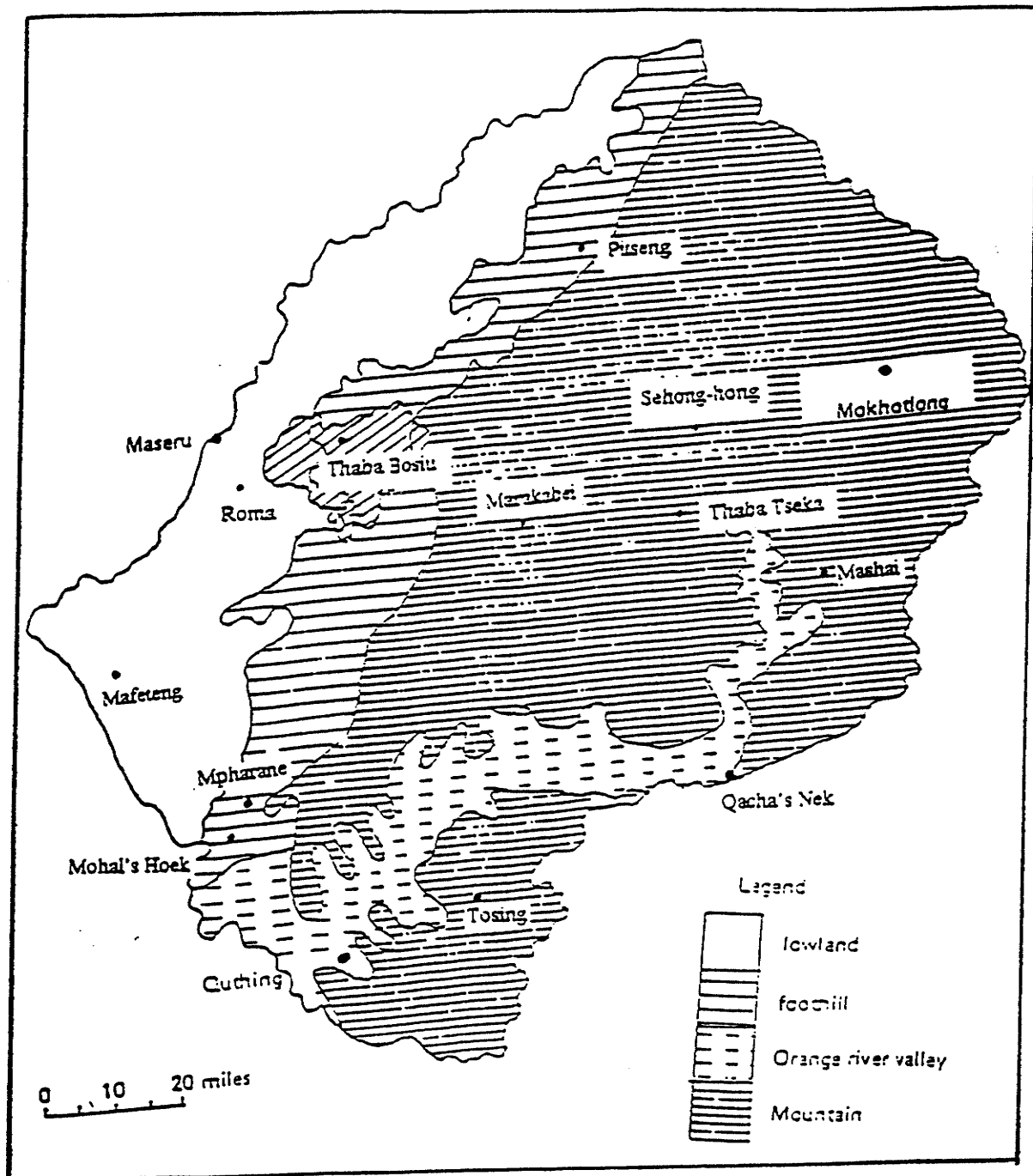
APPENDIX B

A LAND USE MAP OF THABA BOSIU AREA



Thaba Bosiu area land use map

APPENDIX C



The location of rainfall recording stations shown in Table 1