PN-AAT-285
4114B

AGRICULTURAL RESEARCH RESOURCE ASSESSMENT IN THE SADCC COUNTRIES

VOLUME II
COUNTRY REPORT: LESOTHO

Submitted by

Winston P. Nts'ekhe
National Coordinator
Director, Agricultural Research Division
Ministry of Agriculture

Musi Matli
Country Researcher
Deputy Director, Agricultural Research Division
Ministry of Agriculture
Kingdom of Lesotho

and

Dr. Edward M. Wilson
Senior Research Specialist for Lesotho
Devres, Inc.

SOUTHERN AFRICAN
DEVELOPMENT COORDINATION CONFERENCE
Consultative Technical Committee
for Agricultural Research

Private Bag 0033
Gaborone, Botswana
Telephone: 52318
Cable: RESAGRIC

DEVRES, INC.

2426 Ontario Road, N.W.
Washington, D.C. 20009
Telephone: (202) 797-9610
Cable: DEVRES
Telex: 440184

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT

Contract No. AFR-0435-C-00-00-2084-00
Strengthening African
Agricultural Research (SAAR)
Project (698-0435)

May 1985

PREFACE

AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

IN THE SADCC COUNTRIES

This document has been prepared by DEVRES, Inc. in cooperation with the Consultative Technical Committee for Agricultural Research (CTCAR) of the Southern African Development Coordination Conference (SADCC) in accordance with the terms of a contract with the US Agency for International Development.

The national agricultural research resource assessments which provide the necessary background information for this document were conducted by national agricultural research scientists from SADCC countries[1] under the guidance of DEVRES in consultation with the CTCAR. Financial support was provided by the US Agency for International Development (under Contract No. AFR-0435-C-00-2084-00 and Project No. 698-0435 entitled Strengthening African Agricultural Research) on behalf of the member countries of the Cooperation for Development in Africa (CDA).

Discussions concerning this country report were held with the country report authors, responsible officials in the ministries of agriculture, rural development and plan, as well as specialists from international organisations, bilateral donors, and universities. On two occasions, drafts of this final report were examined by SADCC's Consultative Technical Committee for Agricultural Research (CTCAR). Suggestions by its members were incorporated into the report.

The results of the assessment are contained in the following reports:

Volume I - Regional Analysis, Strategy, Programmes and Summaries of Country Reports

Volume II - Country Reports:[2]

Botswana
Lesotho
Malawi
Mozambique[3]
Swaziland
Tanzania[3]
Zambia
Zimbabwe

These reports are available in English and in microfiche or printed form at a cost determined by document size at the address below. The Regional Analysis and Strategy and the Mozambique country report are also available in Portuguese in the same forms.

US Agency for International Development
Document and Information Handling Facility
7222 47th Street
Suite 100
Chevy Case, MD 20815
Telephone: 301/951-7191 ext. 26

---

[1]SADCC member countries are Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. Angola, however, did not participate in this study.

[2]Each country is printed separately.

[3]Italy provided technical advisors for the preparation of the Tanzania national report and France provided an advisor to help in the preparation of the Mozambique country report.

ACKNOWLEDGEMENTS

This report is the result of the conscientious efforts of many people. Special thanks goes to the Directors and staff of the following divisions of the Ministry of Agriculture (MOA): Research Division (RD), Lesotho Agricultural College, Crops, Soil Conservation, Range, Livestock, Extension, Young Farmers Clubs, Home Economics and Nutrition, and the Agricultural Information Office. These people graciously responded to the questionnaires and granted extensive interviews.

This project also relied on reports and documents prepared by several organisations. Data was secured from the Lesotho Bureau of Statistics, MOA and FAO reports, USAID country documents, National University of Lesotho publications, the Lesotho Third Five Year Development Plan, and interviews with government officials and other informed persons. The RD's library was used extensively.

To all who assisted, we express a special thanks for helping this SADCC-ARRA project to achieve its objectives.

LIST OF ACRONYMS AND ABBREVIATIONS

AID	Agency for International Development (United States)
ARRA	Agricultural Research Resource Assessment
BSc	Bachelor of Science degree
CAO	Chief Agricultural Officer
CCO	Chief Conservation Officer
CDA	Cooperation for Development in Africa
CIMMYT	International Centre for Maize and Wheat Improvement
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
CIP	International Potato Centre
CTCAR	Consultative Technical Committee for Agricultural Research
DAO	District Agricultural Officer
DCO	District Crops Officer
DEO	District Extension Officer
DLS	Director of Livestock Services
DOE	Director of Extension
DPS(A)	Deputy Permanent Secretary (Administration)
DTS	Director of Technical Services
EA	Extension Agents
FAO	Food and Agriculture Organization of the United Nations
FSRP	Farming Systems Research Project
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GOL	Government of Lesotho
IARC	International Agricultural Research Centre
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IEMS	Institute of Extra-Mural Studies
IITA	International Institute of Tropical Agriculture
ISCED	International Standard Classification of Education
LAC	Lesotho Agricultural College
LADB	Lesotho Agricultural Development Bank
LDTC	Lesotho Distance Teaching Centre
LMC	Lesotho Milling Company
LPMS	Livestock Products Marketing Services
M	Maloti
MSc	Master of Science degree

MOA	Ministry of Agriculture
NTTC	National Teacher Training College
NUL	National University of Lesotho
OAU	Organization of African Unity
PhD	Doctor of Philosophy degree
PMC	Produce Marketing Corporation
PS	Permanent Secretary
RC	Research Council
RD	Agricultural Research Division
RSA	Republic of South Africa
SACCAR	Southern African Centre for Cooperation in Agricultural Research
SADCC	Southern African Development Coordination Conference
SMS	Subject Matter Specialist
TOU	Technical Operations Unit
UNESCO	United Nations Educational Scientific and Cultural Organization
US	United States
USAID	United States Agency for International Development

CURRENCY EQUIVALENTS
(December 31, 1983)

Currency unit	=	Maloti (M)
US$ 1.00	=	M 1.35
M 1	=	US$ 0.74
M 1	=	100 oicente

WEIGHTS AND MEASURES

1 hectare (ha)	=	10,000 m^2
	=	2.471 acres
1 acre	=	0.405 ha
1 kilogram (kg)	=	2.204 pounds
1 metric ton (MT)	=	1,000 kg
		2,204 pounds
1 kilometer (km)	=	0.621 miles
1 square kilometer (km^2)	=	100 ha
1 mile	=	1.609 km
1 liter	=	1.066 quarts
1 quart	=	0.9464 liters

GOVERNMENT OF LESOTHO FISCAL YEAR

April 1 to March 31

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

A. Background

1. Country description and economic overview

Lesotho is a small, mountainous country entirely surrounded by the Republic of South Africa (RSA) with a semiarid climate. It has a population of about 1.46 million which is growing at the rate of 2.4 percent per annum. Nearly 90 percent of the people live in rural areas; agriculture accounts for 85 percent of resident employment and for 30 percent of the GDP.

Four major economic problems confront Lesotho in 1984: increasing unemployment, rising government debt, lack of investment and a growing balance of payments deficit. Since migrant worker remittances account for a large portion of earnings, the balance of trade is greatly affected by the state of the economy in the RSA. Lesotho's currency unit, the maloti, is tied to the rand, and a good percent of the Government of Lesotho's (GOL) revenues are collected through the South African Customs Union as most imports and exports are through the RSA.

Lesotho's development goal as outlined in the Third Five Year Plan is to reduce external dependence in the economy and encourage local initiatives. The key is to stem declining productivity in the agricultural sector through increased emphasis on all aspects of agricultural research and development of an effective extension service. The GOL has initiated many projects to increase rural incomes, employment and food production. It has also made infrastructural improvements such as roads, airfields and health clinics, and has provided training for rural people. It has attempted to improve marketing through the establishment of the Lesotho Coop and the Livestock Products Marketing Service. The GOL used the Lesotho Agricultural Sector Analysis sponsored by USAID to assist in the definition and recommendation of long-term agricultural policies.

2. Agriculture in Lesotho

The cultivable land area of Lesotho is about 450,000 ha which comprises 13 percent of total land area. Lesotho's soils are generally of low fertility. There are four agro-ecological zones. The Lowlands is the main crop-producing area and represents one-fourth of the country. The Foothills zone is most suitable for cattle raising and dairy production; the Mountain zones are used for summer sheep grazing in the upper ranges, and for beef, dairy cattle and mixed farming in the lower ranges. Some parts of the Orange River Valley can be used for production of irrigated crops such as maize, beans and vegetables. Subsistence agriculture is the norm, although surplus production has long been sold.

Traditional land ownership is communal and animals are grazed on communal lands. Although the system guarantees everyone equal rights to the land, the disadvantage is that it discourages investment in land improvement. Another problem is the scattering of small plots which is uneconomical. The peasants farm approximately 1.4 ha each. The objectives of the Land Tenure Act of 1979 were to increase efficiency and facilitate modernisation by improving tenure security and creating a limited market in land use rights that are transferable and heritable.

The major crops are maize, sorghum, wheat and pulses. After a small annual increase in cropped land area during the mid-1960s, the trend was reversed in the 1970s, probably due to increased migrant remittances which substituted for domestic agricultural earnings. Production and consumption data are not very reliable but, in general, average food consumption is adequate. There is, however, a heavy reliance on imported foods. About 30 percent of maize consumption and about 60 percent of wheat demand are met through imports.

The major livestock are sheep, goats, cattle, poultry, horses, donkeys and pigs. Until the mid-1970s, Lesotho was a net exporter of livestock products, but increased migrant worker earnings also impacted negatively on this sector. In fact, by 1975 beef and cattle imports reached a historic high. Despite the large cattle population which has caused a serious overgrazing problem, annual offtake is very low (12 percent) because cattle are used for draughtpower and as assets.

Fishing is done in rivers, lakes and artificial dams. Recently, aquaculture has been given GOL support through the Fisheries Section of the MOA.

Agricultural marketing problems in Lesotho include the small size of the urban population (13 percent) and the proximity to the RSA which produces some of the same products on large-scale commercial operations, thus at lower cost. In the past, grain trading was done through licensed merchants; prices paid to farmers varied widely and suddenly, and were often low. In 1980 the GOL adopted a policy of greater intervention. The Lesotho Coop was established to buy agricultural products from farmers and to sell them inputs through a network of retail outlets. Outputs are bought at fixed prices and marketed through commission-earning agents. The Lesotho Agricultural Development Bank coordinates all agricultural credit programmes. Credit supplied to farmers is in kind; all crop loans are seasonal and payment in full is due at harvest.

B. Agricultural Institutions

1. Research

a. Programmes, personnel and facilities

Agricultural research is conducted by the Lesotho Agricultural Research Division (RD) of the Ministry of Agriculture, whose objective is to develop agricultural technology which will result in increased productivity, higher farm incomes and improved quality of life. Traditional agricultural research in Lesotho was based on experiment station results from which blanket recommendations were made. The shortcomings of this approach led to the adoption of the Farming Systems Research Project (FSRP) in 1979 with USAID assistance. The emphasis shifted to on-farm adaptive research employing multidisciplinary techniques. A systems approach is employed to develop combination package recommendations.

The major research programmes undertaken by the RD include:

- Crops: The emphasis is on varietal testing of wheat, maize, sorghum and pulses. Recent trials have shown red sorghum to be high-yielding, have identified cold-resistant highland varieties of maize and sorghum, and have shown white Haricot beans, speckled Sugar beans and Pinto beans to be the most productive. Variety trials under irrigation have been conducted on cabbage, asparagus and tomatoes;

- Livestock: The objective has been to develop cost-effective feeding programmes for oxen, using fodder and a protein/mineral supplement during the winter to keep them healthier for the ploughing in early spring. Grazing and stocking rate trials are also underway. Feeding and selection trials to improve the quality of sheep and goats and research on better range management are also being done;

- Farming Systems Research methods are an integral part of the Division's work. A prototype area has been developed in each of the three productive geographic zones where on-farm trials are conducted;

- The farm management programme gathers information on farm records, processes and analyses the data, and conducts costs and returns and marketing analyses;

- The extension effort is geared towards training in extension education to facilitate transfer of research findings to farmers, to design and test methods to establish cooperative production and management and to obtain feedback at the village level; and

- A rural sociology program conducts surveys and analyses social data to assist in the solution of production and farmer acceptability problems.

The RD is headed by a Director assisted by a Deputy Director and an advisor, who is also the FSRP team leader. Altogether there are 67 employees, including three administrators, 15 professionals of whom nine are expatriates, 28 technicians and 21 support staff. Currently, 12 professionals and two technicians are in training, the former in the US and the latter at the Lesotho Agricultural College (LAC).

Crop research is conducted at seven field stations which are staffed by caretakers and which have no buildings or equipment. Each of the three prototype production areas has a small field station with four buildings. The library, located at the main agricultural research building, is the official MOA library and serves as the repository for all local agricultural publications. It contains 10,000 volumes and up-to-date holdings of some leading journals. The main experimental farm at Maseru has 22 ha of land, of which eight are used for experimental plots, five for seed multiplication, seven for irrigated vegetable research and two for fodder. The total amount spent on research came to US$ 2.2 million in 1983-84. The RD programme's funding is from the following sources: the MOA (18 percent), USAID (80 percent) and FAO (2 percent).

b. Evaluation

In general, the research programme is directed at high-priority problems. On-farm trials with a systems approach are backstopped by well-planned and well-executed research work at Maseru and selected field stations. The RD cooperates with the SADCC countries and with a number of international organisations. More specifically, its strengths are the following:

- The emphasis on varietal testing in crop production that explicitly considers the practical situation of farmers;
- Livestock research focussed on applied animal nutrition feasible for average village farmers;
- Range research addressing high-priority concerns such as optimal stocking rates, range burning, brush control, and short-duration rotation grazing system;
- Good long- and short-term staff training programmes to increase the number of nationals in professional positions; and
- The emphasis on information dissemination, leading to the establishment of an Extension Unit with a link to the Extension Service of the MOA.

Some of the weaknesses are the lack of adequate linkages with the LAC, the lack of sufficient focus in activities on the Main Station and e three prototype areas, and the lack of a computerised data base.

2. Training

a. Programmes, personnel, and facilities

The Lesotho Agricultural College (LAC), based in Maseru, is a division of the MOA and an affiliated College of the National University of Lesotho. There is a branch campus at Leribe that provides training to the certificate level for up to 30 students. The LAC is located close to the RD which is ideal for expanded collaboration. It is linked to the extension programme through the participation of the students in practical training. The LAC offers: two-year certificate programmes in general agriculture, agricultural mechanisation and home economics; a one-year certificate programme in forestry; and a two-year diploma programme in agriculture. The LAC's operating budget, which amounted to US$ 549,220 in 1983-84, is received from the MOA.

The LAC is headed by a Principal who is assisted by a Director at each of the two campuses. Ten of the 19 professional positions at the LAC are held by nationals, five by expatriates; four positions are vacant. The College has excellent facilities to accommodate 200 residents, classroom capacity for an equal number, and good conference room and office facilities for the administrators. The library has 500 volumes and 20 periodicals; acquisitions average 20 volumes per year. The College farm has 112 ha and includes soils representative of most of the farming areas of Lesotho.

The Thaba Khupa Ecumenical Centre Farm Institute provides practical training in agriculture to enable students to become self-employed commercial farmers but does not offer certificates recognised by the GOL. Part of the admission requirement for each student is the guarantee of a ha of land in his or her home area, the idea being to design a curriculum of study specifically for students' individual needs. The Institute also conducts short courses. The land for the Institute was granted by the Chief of Thaba-Bosiu; financial support is provided by the World Council of Churches and other local and international organisations. The students are also charged a fee which covers approximately one-fourth of the cost of their training.

The National University of Lesotho (NUL) does not currently offer courses in agriculture but plans are underway to create a Faculty of Agriculture which will offer courses to the bachelor's degree level. The NUL's Institute of Extra-Mural Studies is a nonformal educational service whose work in increasing trained manpower will have a positive impact on agricultural development.

b. Evaluation

Some weaknesses of the LAC include: the lack of sufficient linkages with extension programmes and with the RD; the lack of an agricultural information centre that can interpret research findings and adapt them to farmers' needs; and the lack of appropriate salaries and training incentives for the staff.

The Thaba Khupa Institute is unique in providing practical training carefully designed for the needs of Lesotho farmers. It is designed to address the two major national problems of unemployment and increased food production. The weaknesses of the Institute are the limited capacity (35 students), insufficient linkages with the RD and the Extension Division, and limited financial resources. A subsidy from the GOL would enable the Institute to keep fees to a level affordable by its students.

3. Extension

a. Programmes, personnel and facilities

Agricultural extension services are provided entirely by the National Agricultural Extension Service of the MOA. Its four major units are Agricultural Information, Nutrition and Home Economics, Youth, and Farmer Training Centres. The Field Service is organised into ten District Administrative Units which provide village-level services. The Technical Division of the MOA provides Subject Matter Specialists (SMSs) to train Extension Agents (EAs) and backstop their field work. The RD, through the FSRP, collaborates with the extension field staff by providing information obtained through the Extension Research Unit.

Linkage with producers is provided by the EAs residing in villages. The lack of transportation, however, hinders their contact with outlying producers. Extension programmes are based on national development objectives and farmers' needs. The EAs, working as generalists to diffuse agricultural information, hold training sessions and field trials and demonstrations. The extension work is conducted with help from an information unit and six farmer training centres.

The National Extension Service is administered by the Director who is assisted by the Chief Extension Officer and Senior Extension Officer. At the field level, each of the ten districts is headed by a District Agricultural Officer and an officer for extension who supervises the Area Extension Supervisors and the EAs. Of the 972 staff, there are 39 administrators, 49 professionals with BSc degrees (of whom 18 are expatriates), and 884 technical staff with diplomas or certificates.

The national staff is adequately housed in Maseru. Each district has an office building; however, there are no offices at the village

level. The extension budget derives from the GOL through the MOA. Over the past three years GOL's economic difficulties have resulted in austerity measures that have translated into vacancies in the Extension division. The total budget from 1984-85 is US$ 507,392, or 5.9 percent of the MOA budget.

b. Evaluation

The Extension Service can become a most effective means for change and increased productivity. However, it lacks adequate financial and human resources. Other weaknesses are the lack of integration of the administrative and technical units under one administrator, insufficient in-service education for the EAs and training for the technical specialists, weak linkages with the Extension Division, the RD and the LAC, and the lack of an appropriate incentive structure to attract and keep personnel. Some programme restructuring also will be required to encourage local participation in decision-making so that villagers feel the institution is responsive to their needs.

C. Constraints to Agricultural Production and Production Potential

1. Food crops

Average crop yields on peasant farms in Lesotho have increased in recent years, but they are still extremely low relative to those obtained by the RD. For example, RD yields of maize and sorghum were often two to three MT/ha, while small farmer yields were 847 kg/ha and 795 kg/ha, respectively. The major physical, biological, economic, traditional and institutional constraints are discussed below.

The physical and biological constraints to increased production include:

- Poor rainfall distribution accompanied by severe monsoons and hailstorms, frost and drought;
- Soil degradation which is caused by erosion and overgrazing, lack of organic matter and infertility;
- Lack of effective weed control;
- Lack of availability of appropriate hybrid seed varieties;
- Farm labour shortages arising from the migration of male work force to the Republic of South Africa; and
- The weakness of the cattle due to inadequate nutrition at the end of the winter when they must be used for ploughing.

The chief economic constraints are the following:

- o Pricing: The uncertainty created by the variation in crop prices from year to year and the fact that prices are in effect largely determined outside Lesotho in the Republic of South Africa;

- o Marketing: Problems stemming from the facts that much of Lesotho's agriculture is in isolated regions, transport costs are high and communication is irregular; and

- o Credit: The limited availability of credit, despite the founding of the Lesotho Agricultural Development Bank in 1980, due to the facts that the only operating facility is in Maseru and there is no institutional channel to distribute funds to rural districts and that subsistence farmers, especially women, often lack collateral.

The traditional land tenure system is a constraint because it results in very small farm size (1.4 ha), which acts as a disincentive for investment in land and for greater intensity of land use. It is also an obstacle to shifting to commercial production and to adoption of modern technology.

The institutional constraints include lack of applied agricultural research and a lack of adequate training facilities and a developed extension service.

2. Livestock and livestock products

The main problems with cattle, sheep and goat production in Lesotho are that the land is already overgrazed and soil erosion is severe. Other constraints are the following:

- o Physical and biological: Lack of availability of fodder and water, insect-borne diseases, internal parasites and poor breed quality;

- o Economic: Input and animal prices, lack of slaughter and marketing facilities, lack of credit availability and inadequate subsidy and import policy;

- o Rural traditions: Communal grazing acting as a disincentive to investment in improving rangelands, and cattle grazing being supervised by untrained herdboys who know little about animal nutrition; and

- o Management: Ineffective range management practices and inadequate pasture land as they negatively impact cattle health and nutrition.

D. Staff Assessment of Institutions

The main problems affecting the performance of the Research Division, the Lesotho Agricultural College and the National Extension Service as identified through staff questionnaires were the following: insufficient financial support, and inconsistencies and delays in funding; a lack of adequate training for national staff at all levels; an inadequate and insufficient number of laboratories and offices; a lack of essential equipment and maintenance; a lack of funds to purchase and maintain vehicles; and unfavorable terms of service and benefits for staff, including lack of staff housing, low salaries, lack of well-defined promotion schedules, and lack of health and retirement benefits.

A particular concern at the Agricultural College was the limited and outdated collection of library materials and the restriction that books could be used only at the library. In addition, work at the National Extension Service was particularly hampered by the lack of sufficient number of operating vehicles. Suggestions for removing the constraints were improved linkages between the institutions and the establishment of a Research Council composed of officers from the major divisions of the MOA to approve all decision-making.

E. Conclusions and Recommendations

1. Agricultural institutions

a. Research Division

The following actions are recommended for the Research Division:

- Continuation of its staff development plan of long-term training of nationals and interim employment of expatriates;
- Establishment of formal linkages between the RD, the Extension Service and the LAC through joint personnel appointments and memoranda of understanding on joint programming and planning; and
- Increased funding to cover recurrent costs and expand on-farm applied research.

b. Lesotho Agricultural College

Actions recommended to strengthen the Lesotho Agricultural College are the following:

- Increased employment of qualified nationals with training in agricultural production and the practical aspects of farm management;

- o Curriculum reorganisation to specialise in areas where the LAC has a comparative advantage in the SADCC region, namely, soil and water conservation and range management; and

- o Conduct of in-service education courses for extension workers and development of programmes to complement training at the Farmer Training Centres.

c. Extension Service

Strengthening of the Extension Service requires the following actions:

- o In-country, short-term, on-the-job training and long-term, academic training for the EAs and SMSs, and training for administrators, supervisors and specialists in management, programming, supervision and extension methodology;

- o Consolidation of the MOA's Technical Division and the Extension Division;

- o Provision of better transport at the village and district levels so extension workers can increase contacts with farmers; and

- o Provision of teaching aids and other resources to improve field demonstration projects.

2. Agricultural productivity

The following actions are recommended to expand agricultural productivity:

- o Adoption by the GOL of appropriate policies and incentives to develop the agro-industrial sector. This would increase the value added of agricultural products, improve farmer prices, and provide jobs;

- o Development of a nationwide education program to explain the value of the 1979 Land Tenure Act;

- o Judicious use of land leases and GOL designation of certain areas for commercial agricultural production;

- o Establishment of a national computerised data base containing description, objectives, procedures, results and recommendations of all agricultural research activities. This would result in a saving of human and financial resources that could be directed to solving production-related problems;

- Continuation of present activites in water, soil and range conservation and urging of donor countries to fund long-term projects;

- Establishment of labour-intensive production of fruits and vegetables in the irrigated Northern Lowlands;

- Development of appropriate social technologies: to bridge the gap between the nature and extent of women's agricultural responsibilities and the social custom that assigns decision-making to the men; to maximise acceptance of new technologies; and to convince livestock holders to produce commercially;

- Development of alternate strategies to increase soil fertility by ploughing under stubble, reducing the livestock population and expanding use of pulses in fertility-building crop rotations;

- Increased road construction and repair;

- Improvement in the quality of education to better prepare students to pursue higher education in agriculture; and

- A GOL strategy to seek long-term donor funding and to carefully coordinate and focus activities on the most pressing problems.

I. INTRODUCTION

A. Background

This Agricultural Research Resource Assessment (ARRA) was conducted from July 1983 through August 1984 in the following countries of the Southern African Development Coordination Conference (SADCC): Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. The ARRA was initiated as a result of discussions between the SADCC Consultative Technical Committee for Agricultural Research (CTCAR) and representatives of the Cooperation for Development in Africa (CDA). The CDA is an informal association of donors including Belgium, Canada, France, Italy, West Germany, the United Kingdom and the United States.

The inventory and assessment were carried out within the framework of the high priority accorded by the CDA to developing and strengthening agricultural research capability in Africa. The United States, assisted by other CDA donors, was assigned the specific responsibility for coordinating the development of CDA-supported agricultural research programmes in the Southern African and Sahelian regions. The ARRA inventory reports were financed by the United States Agency for International Development (AID) for CDA, and were carried out with the full collaboration and support of SADCC through the CTCAR. DEVRES, Inc., a U.S. private consulting firm based in Washington, DC, was engaged by AID to implement the ARRA together with senior agricultural research personnel from the SADCC countries and to prepare a SADCC regional report. Two other CDA donor countries, Italy and France, also provided technical experts and other assistance for some of the SADCC countries' reports.

The CDA members recognise that the African nations have established Africa-wide and regional institutions, such as SADCC, and that the heads of African states have given unanimous support to the Organization of African Unity's Lagos Plan of Action which emphasises the development of a strong capability to increase agricultural productivity. The donors have, therefore, joined with the African countries and their regional organisations--SADCC in Southern Africa and the Institute du Sahel in the Sahel--to develop country-specific and regional analyses of existing resources and of the medium- to long-term needs and opportunities in agricultural research that will lead to increased agricultural productivity.

The World Bank, in its 1983 report entitled Sub-Saharan Africa: Progress Report on Development Prospects and Programs, reiterated its emphasis on the high priority which governments and donors should give to agricultural research. More specifically the report noted:

> Even within the present state of technical knowledge, improved incentives and marketing arrangements would permit very large increases in agricultural output. However, for the longer term, increased output will depend on the development of effective technical packages, pest and disease control and developments in animal husbandry. . .In a situation of budgetary stringency and of immediate crisis, expenditure on research having a possible, but uncertain, payoff ten years or more in the future is frequently seen as dispensable. This danger is increased when research programmes are manifestly weak and unfocussed. It is, therefore, essential that these programmes be formulated and implemented in ways which will enable them to contribute more effectively to the process of development. . .[1]

The ARRA reports, and the recommended research priorities, programmes, and projects within them, are set in a 20 to 25 year time-frame. This long-term perspective permitted the flexibility to make recommendations which are more carefully adapted to the needs of agricultural research. Individual country research staff in charge of country reports, assisted by technical experts provided through the CDA have endeavoured to be sensitive and responsive to the severe budgetary constraints in SADCC countries. The reports confirm that, even when a high priority is given to research, the SADCC country governments initially will not be able to meet all of the recurrent costs of certain research projects. Donors, therefore, will need to provide for some of these costs.

B. Methodology

This study was carried out with the full participation of African professional agricultural researchers and agriculturalists. It was agreed that such participation was of central importance for all phases of the activity--the design of the questionnaires, the data collection process, the analysis, the assessments of research programmes and direction, the actual preparation of the country reports, and the development and review of a regional agricultural research strategy. DEVRES provided a group of technical experts who had wide African and other international experience to assist the country researchers, to contribute to the analysis of the country reports, and to prepare a SADCC regional report. Italy and France also provided technical experts to assist country researchers in Mozambique and Tanzania, respectively.

The ARRA was initiated with a pilot study performed collaboratively with the SADCC member states of Botswana, Malawi and Swaziland. Following review of this pilot report by both SADCC and CDA members, the ARRA was expanded to include additional SADCC countries: Lesotho, Mozambique, Tanzania, Zambia and Zimbabwe. At the time these countries were added, the pilot country reports were updated and a regional analysis was prepared.

Senior researchers from the SADCC countries were designated as National Coordinators. Each Coordinator provided overall direction and support for the ARRA in her/his country. In turn, each Coordinator nominated researchers to be in charge of completing the questionnaires and preparing the national reports for their respective countries. The Country Researchers also used other experienced researchers for short periods to help complete questionnaires on specific subjects. The scope of the questionnaires included not only the research institutions, but also training institutions and extension institutions which provide links between research professionals and the farmers who are intended to utilise research results.

The expanded ARRA was prepared from July to September 1984 by the Country Researchers in cooperation with the DEVRES staff. A regional report, including summaries of the national reports, was prepared by DEVRES in consultation with the CTCAR members and the Country Researchers. The regional report was based on a regionally-oriented analysis of programmes and national reports, on the answers to the questionnaires, on contacts with international research organisations and national and international donors, and on other available information.

During the course of the ARRA, DEVRES provided assistance in the development of a computerised data bank to process ARRA data and to assist the SADCC countries in meeting their future needs for research which, when combined with other available information, can provide a foundation of practical, useful data that can be continuously updated. The data bank can be a valuable tool for use by those designing programmes and projects in agricultural research. It will remain with the Southern African Centre for Cooperation in Agricultural Research (SACCAR) which will update the data bank, as well as ARRA, in the future.

In preparing recommendations for programmes and projects, the National Coordinators, Country Researchers and DEVRES staff took into account research work already proposed or underway. New ideas were also included in this country report and in the regional report as well. One of the principal objectives of the analysis was to build on existing national research, analyses, conclusions and recommendations in a manner which will strengthen these research activities. A concerted effort was made to place recommendations in a wider context, involving not only the research institutions, but also the training of researchers, the use of research results by the farmers, and the linkages with other SADCC member institutions or other international research institutions.

---

[1]The World Bank, Sub-Saharan Africa: Progress Report on Development Prospects and Programmes (Washington, D.C.: The World Bank, 1983).

II. GENERAL INFORMATION ON LESOTHO

A. Description of the Country

1. Geography

Lesotho is a small, mountainous country with an area of approximately 33,000 km^2 surrounded totally by the Republic of South Africa (RSA). It lies between latitudes 28° and 31° South and longitudes 27° and 30° East. (See Figure 1.) It is the only country in the world whose entire area lies more than 1000 m above sea level. The land rises like an amphitheatre from 1500 m in the west to above 3000 m in the east. Lesotho is well-endowed with rivers and streams, and forms part of the major watershed of the Republic of South Africa. Some principal rivers originate in the mountains of Lesotho and flow into the RSA. For example, the Orange River flows westward into the Orange Free State, and the Tugela River flows eastward into Natal. The Caledon River forms the Northwestern boundary with South Africa's Orange Free State, and the Drakensberg Range forms the Eastern boundary.

The cultivatable area of land is approximately 450,000 ha, or about 13 percent of the total area of the country. The soils of the arable land are of low fertility and have been further damaged by severe erosion. Apart from some scattered valleys of limited size, the mountain areas are suitable only for grazing. The area estimated as suitable for grazing is 1.8 million ha or 60 percent of the land area. The rangelands have suffered greatly from overgrazing, and the steep, rocky slopes provide plant material often deficient in phosphate, calcium and other minerals. The animals normally grazing the mountains are cattle, sheep, goats and, to a lesser extent, ponies.

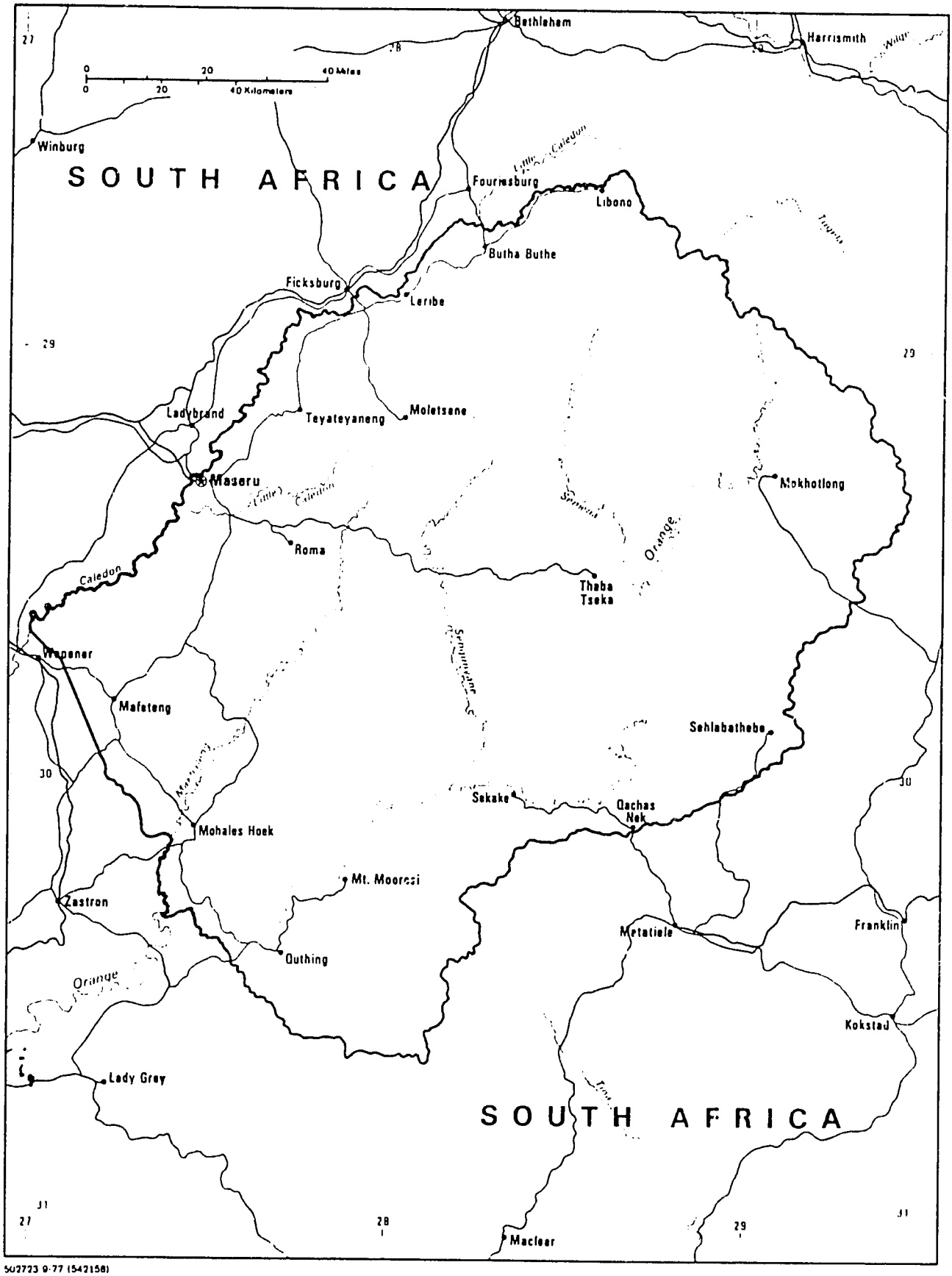
2. Agro-ecological zones

Lesotho is divided into four agro-ecological zones: the Lowlands, the Foothills, the Mountains and the Orange River Valley. (See Figure 2 and Table 1.)

a. Lowlands zone

The Lowlands is a narrow zone on the western side of the country extending from the north to the south. This area represents approximately one-fourth of the country and most of the arable land. The elevation ranges between 1500 and 1850 m.

This is the main crop-producing zone. It is divided into two sub-zones (north and south of the Mafeteng/Maseru district border). The northern Lowlands sub-zone enjoys better climatic conditions: it is suitable for intensive crop production and localised dairying. The southern Lowlands sub-zone is suitable for drought-tolerant crops like sorghum and sunflower, and for fodder production. This area could

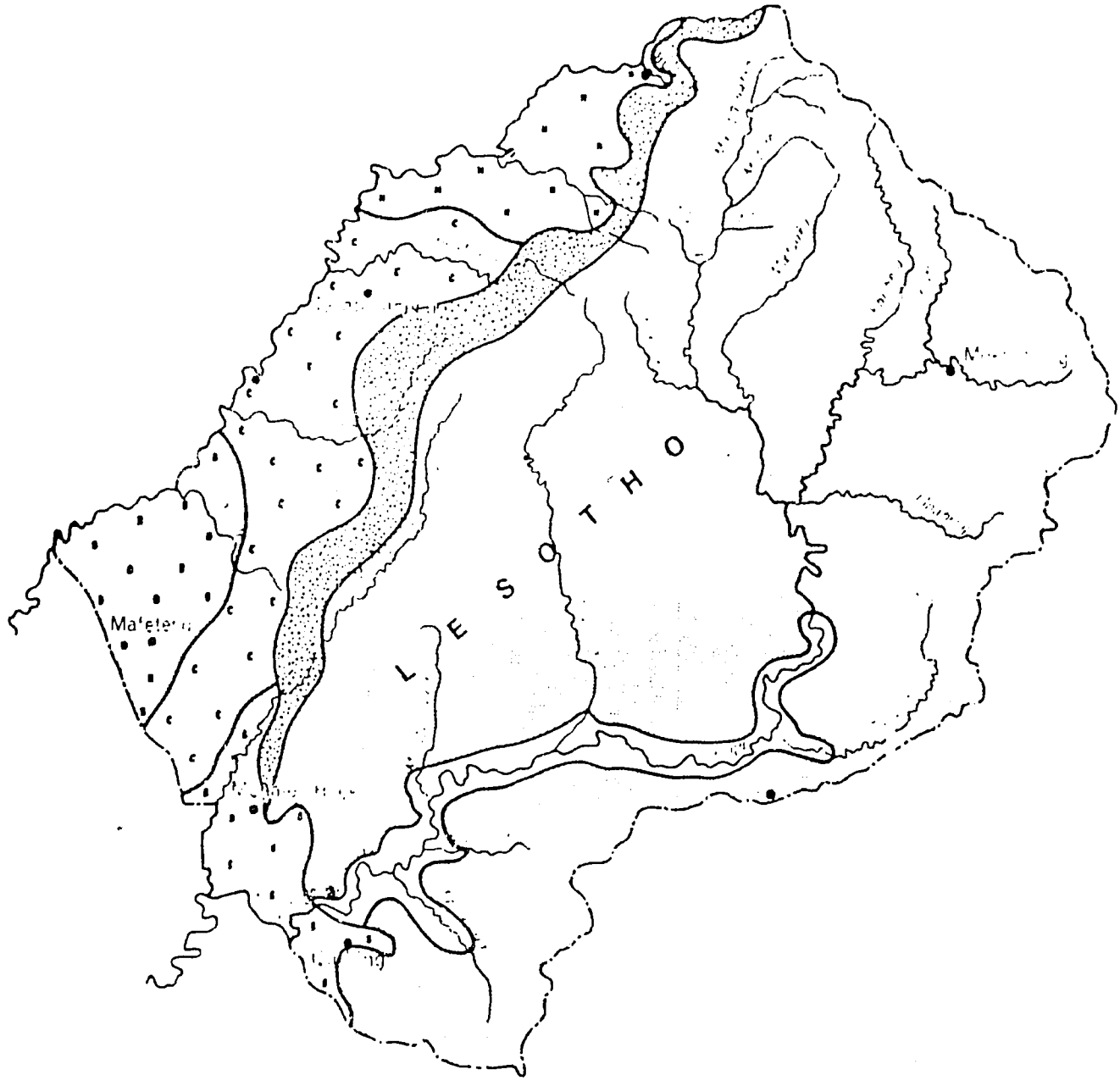


502723 9-77 (542158)
Lambert Conformal Projection
Standard parallels 6° and 30°
Scale 1:1,500,000

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

——— Railroad
– – – Road

Figure 1: Map of Lesotho



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 2: Physiographic Regions of Lesotho

Source: Binnie and Partners, 1972.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 1: Ecological Regions and Their Characteristics

Region	Area (km^2)	Altitude (m)	Average Annual Rainfall (mm)	Frost Free Days	Temperature (^oC)	Predominant Vegetation
Lowland	4,950	1,500 to 1,850	700	243	14.8	Cymbopogon and Thameda
Foothills	4,125	1,850 to 2,100	765	266	14.6	Thameda Triandra
Mountains	21,780	2,100 to 2,550	833	190	12.5	Festuca Rubra and F. Caprina
Orange River Valley	2,145	1,500 to 1,850	800	NA[a]	13.9	Eragrostis

[a]NA = Not Available.

Source: Farm Management and Research Appraisal in Lesotho, W. J. Russell, 1979.

also support dairy cattle if irrigation were used for grain and fodder production.

Livestock production in the Lowlands generally includes oxen, dairy, swine and poultry.

b. Foothills zone

The agriculture of the foothills zone consists of crop production, livestock production, and some mixed farming. It is most suitable for fattening beef animals and for dairying. Its cool climate could be exploited for increased crop production and livestock breeding. The elevation ranges between 1850 and 2100 m.

c. Mountain zone

The mountain zone can be divided into two sub-zones, the Lower Mountain zone and the Upper Mountain zone. The elevation ranges between 2100 and 2550 m.

(1) Upper Mountain zone

The Upper Mountain zone consists of the area above 2550 m. The area has steep slopes, but it produces grass suitable for summer grazing by small stock such as Merino sheep and Angora goats. Cultivation of crops and grazing of large stock is officially discouraged in this area, because of the steep slopes and a severe soil erosion problem.

(2) Lower Mountain zone

The Lower Mountain zone starts immediately above the upper line of village development and is suitable for livestock grazing. Beef and dairy cattle are most suitable where the zone borders on the Foothills zone. This area is suitable for Irish potatoes, grapes, wheat, and fruit trees such as apple, pear, peach, and plum. The elevation ranges from 2100 to 2550 m.

d. Orange River Valley

The Orange River Valley is a narrow extension of the Lowlands zone along the steeply confined Orange River Gorge. Where the land is protected from overgrazing, it is usually densely bushed. Some sections of this valley are used for crop production. The elevation ranges between 1500 and 1800 m.

3. Natural environment

Lesotho is divided into two physiographic provinces: the Lowlands and the Mountains. The Lowlands are part of the South African Highveld, and the Mountains are part of the Drakensberg Range.

The Lowlands consist of a belt of sedimentary rocks that outcrop along its eastern border. The width of the belt varies from three to 50 km.

There are extensive plains in the extreme western part of Lesotho that are underlain by Beaufort and Molten rocks, with an elevation of about 1500 m. These plains are composed of broad pediments that merge smoothly into convex interfluves. The broken and hilly topography of much of the molten and red beds outcrop has been produced by extreme erosion and slope retreat. Erosional processes are very active and are forming deep gullies.

Soil formation in the Lowlands is indirectly dependent on the underlying bedrock. The thick mantles covering pediment slopes probably were formed by long periods of intense erosion during the interglacial period, followed by gentle colluviation and accretion. This region is characterised by claypan soils, with the top soils ranging from loamy fine sand with subsurfaces of fine sandy clay loam to dark firm clays.

The mountains are the result of the outpouring of the Drakensberg lavas. The resultant basalt covers at least 67 percent of Lesotho. The mountain soils are thin, black, gritty clays with a high content of weathering materials. There are many outcrops of bare rock.

4. Climate

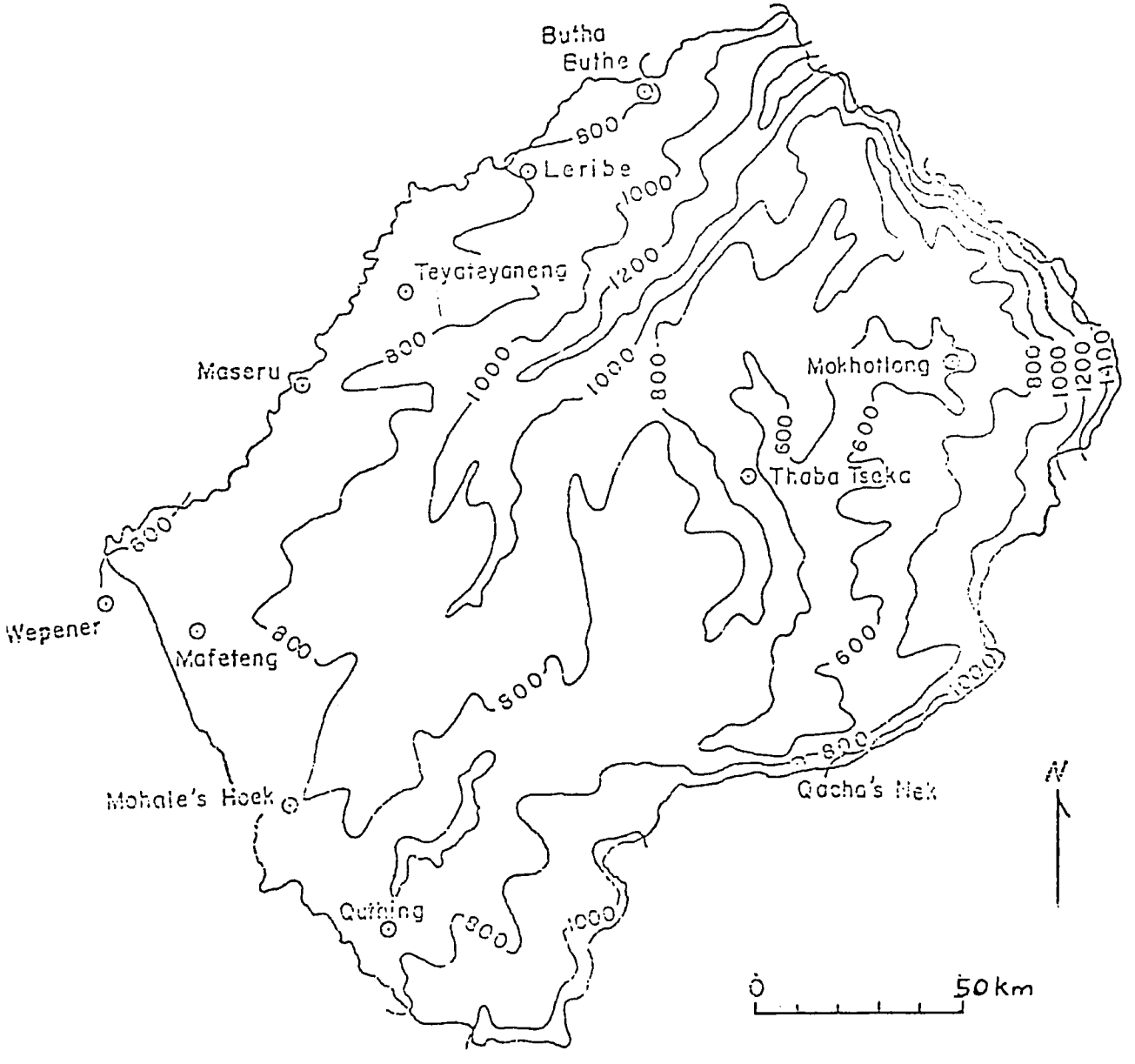
The climate of Lesotho is semiarid. Rainfall averages about 720 mm a year over most of the country. (See Table 1 and Figure 3.) Most rain falls in the summer between October and April, usually as heavy thundershowers of high intensity. Snow falls in the winter, especially in the mountains. Lesotho is warm in summer and cold in winter. In the Lowlands, the temperature varies from 32° C or more in the summer to -6° C in the winter. In the Highlands, temperatures sometimes fall below -18° C.

Relative humidity varies between 45 and 80 percent, being the lowest in the months of August and September and highest during the summer months.

B. The People

1. Population

The population of Lesotho is estimated to be 1.46 million, and continues to grow at the rate of 2.4 percent per annum despite efforts through Health Education to reduce this rate. (See Table 2.) Nearly 90 percent of the people live in rural areas, and most of them have access to agricultural resources in the form of land or livestock. The structure of the population is characterised by greater numbers of women than men and a high proportion, over 40 percent, under the age of 15 years. The growing population in the 6 to 15 year



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 3: Mean Annual Rainfall

Source: Gene C. Wilken, Agroclimatology of Lesotho (Maseru: Ministry of Agriculture, 1978).

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 2: Social and Economic Indicators of Development

Indicator		Average Annual Growth Rate (percent)	Comment
Total population[a,b]			The population density is approximately 40 persons per km^2, but since much of the Maloti Mountain is uninhabitable, most of the population is concentrated in the Lowlands.
1976	1.22 million		
1984	1.46 million	2.4	
Percent of total population living in rural areas[c]			The great majority of Basotho are subsistence farmers. But as the population grows, the trend is for more people to live in urban areas.
1960	98		
1981	88		
Percent of population 14 years old or less[a]			Lesotho is a nation of young people with approximately 94 percent of the people below 65 years of age.
1976	39		
1981	40.9		
Percent of labour force involved in agriculture[c]			It is estimated that 60 percent of Lesotho's work-force men are migrant workers, leaving women and children to farm.
1960	93		
1980	87		
Percent of CDP attributable to agriculture[a,c]			
1976	31.7		
1981	31.0		
Migrant workers employed in RSA[d]			It is projected that the number of migrant workers employed in the RSA will reduce to 100,000 by the year 2000.
1976	200,000		
1984	160,000		

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 2: Social and Economic Indicators of Development (cont.)

Indicator	Average Annual Growth Rate (percent)	Comment
Per capita GNP[c]		
1981 US$ 540	7.0	The average annual growth rate is calculated for the years between 1960-1981.
Adult literacy percent[c]		
1980 52		
Life expectancy at birth[c]		
1960 42 years		
1981 52 years		
Volume of cereal imports[c]		In recent years Lesotho has experienced a reduction in food production per capita due to drought conditions.
1974 49 MT		
1981 95 MT		

[a] Lesotho Economic Indicators, World Bank/UNDP Team Report, 1981.

[b] Lesotho Bureau of Statistics estimate, 1984.

[c] IBRD/The World Bank, World Development Report 1983 (New York: Oxford University Press, 1983.)

[d] Jerry B. Eckert, Toward the Year 2000, LASA Research Report No. 10 (Maseru: Government of Lesotho, 1982)

age group cannot be accommodated in the educational system. A general lowering of the standard of living seems inevitable unless effective means are found to control population growth, and/or to expand agricultural production. Sixty-eight percent of the 20 to 30 year age group are females who thus outnumber males by more than two to one. More than half of the males in this age group live outside of Lesotho, most as emigrant workers in the mines in South Africa.

The pattern of settlement in the country has evolved over time with the majority of the population now living in the Lowlands. The District of Maseru, which also contains the Capital, has the largest number of people. The second highest area in terms of population is Leribe. Although an examination of population size by District is important, comparisons may be meaningless because of the varying sizes of Districts. For instance, in 1976 the population density for Lesotho was 40 people per km^2, but the Districts of Mafeteng and Berea supported 73 and 66 people per km^2 respectively. The limited amount of arable land in Lesotho, only 13 percent of the total land area, has serious implications for a nation the majority of whose people depend on agriculture.

2. Occupational patterns

Agriculture employs about 85 percent of the resident labour force and accounts for 30 percent of the Gross Domestic Product (GDP). About 30 percent of the agricultural output is marketed locally, and consists mainly of maize and wheat.

A large number of able-bodied young men are employed in the mines of the Republic of South Africa. This group represents 32 percent of the economically active population. The employment is temporary and migratory in nature. Migrants' remittances are considerably higher than the GDP, and are used to finance the large trade deficit. In addition, many households are highly dependent on this source of income. Since 1975, 60 percent of the miners' income has been remitted to Lesotho and retained by the government until the workers return at the end of their contracts.

This relatively high income by migrant workers in the RSA is making Basotho become accustomed to a monetary economy where the emphasis is on consumption rather than production. This diminishes the effectiveness of measures aimed at promoting domestic agricultural development.

3. Language and ethnic groups

Lesotho has no officially recognised ethnic groups. All nationals consider themselves Basotho and speak Sesotho, even though 20 percent are of different origins such as Nguni, Indian and Griqua.

Lesotho has two official languages: English and Sesotho. Both languages are taught in public schools. English is the medium of instruction from the fifth year of primary school onwards. A large number of Basotho are thus able to speak both languages. Sesotho belongs to a group of languages so closely related that they are mutually understandable. The Sotho group includes Setswana, Sepedi and Silozi.

4. Religion

Eighty-two percent of the people of Lesotho are Christians. The first missionaries who came to Lesotho in 1883 were from the Paris Evangelical Mission Society[1], now known as the Lesotho Evangelical Church. They were followed by Anglicans and Roman Catholics.

Christian Missions to Lesotho do not confine their activities to religion, assisting in the provision of health services and education as well. Of the three main churches mentioned above, the Roman Catholic denomination has the largest membership, consisting of approximately 39 percent of the population. It is followed in numbers by the Lesotho Evangelical Church with about 24 percent, and the Anglican Church with 11 percent. The following churches share 8 percent: Methodist Episcopal Church, Assemblies of God, Dutch Reformed Church, Seven Day Adventist Church and several independent Zionist Churches. Services are held in Sesotho, but there are some English services in the principal towns.

5. Educational system

In 1971, the primary school levels were changed from a system which included Grades A and B and Standards One through Six to the International Standard Classification of UNESCO.

a. Primary and secondary education

Primary education is designed for children between the ages of six and twelve. This system provides seven years of basic education in reading, writing and arithmetic with an elementary understanding of history, geography, religious knowledge, and natural and social sciences. Its stages are designated Grades or Standards One to Seven. Lesotho is fortunate to have acquired through the missions a widespread primary school system. Today more than 50 percent of the adult population are able to read and write Sesotho.

Secondary education includes three years of Junior Secondary and two years of Senior Secondary. Lesotho has 1080 primary shcools and 86 secondary schools. Lesotho does not have enough capacity to adequately serve the population.

b. Teacher training and vocational education

Lesotho's primary school teachers were formerly trained in seven small denominational colleges, but the National Teacher Training College (NTTC), which opened in 1975, now provides improved facilities in a single institution for both primary and secondary teachers.

Vocational and technical education is provided by: Lerotholi Polytechnic, Leribe Technical School, and Leloaleng Technical Institute. These institutions offer courses in building construction, carpentry, motor mechanics and business administration. Students may obtain Certificates or Diplomas. The Lesotho Agricultural College offers Diploma and Certificate programmes in agriculture and related disciplines. This institution has two campuses, the headquarters in Maseru and a branch in Leribe.

c. National University of Lesotho

A regional university was formerly shared by Botswana, Lesotho and Swaziland. In 1975, the University's Roma Campus was nationalised to form the National University of Lesotho (NUL). NUL provides for Lesotho's higher education needs in humanities, pure science, education, law, economics and social sciences. For degree courses in fields such as agriculture, engineering and medicine, which are not offered by NUL, arrangements are made by which students can spend two years at NUL, and then transfer to other universities offering these specialisations.

d. Nonformal education

Many agencies assist in providing nonformal education, especially for adults and youths in rural areas. The foremost of these is the Lesotho Distance Teaching Centre (LDTC), a semiautonomous agency of the Government. It prepares candidates for the Junior Certificate and Cambridge Overseas School Certificate examinations through radio broadcasts and literacy and numeracy materials. LDTC also helps untrained teachers who seek to become qualified. There is a nominal cost for these services.

The Institute of Extra-Mural Studies (IEMS) of the NUL also provides nonformal education. It offers courses in accounting and management to farmers and women's organisations.

In addition, IEMS produces a weekly radio programme and a monthly newsletter. The newsletter is distributed free of charge to approximately 10,000 Basotho villagers as well as to miners who are working in the RSA.

C. Government and Political Framework

1. Structure of government

Lesotho is a Kingdom, with King Moshoeshoe II as the Chief of State. Until 1970 Lesotho was a consitutional monarchy, with an elected, bicameral Parliament consisting of a 60-seat National Assembly and a 33-seat Senate.

In 1970 the King, with the advice of the Prime Minister, appointed the present Interim National Assembly which includes members from Lesotho's four legal political parties. The Cabinet is also appointed by the King in accordance with the Prime Minister's recommendation.

2. Political parties

Even though Lesotho's social structure is homogeneous, there are diversified political parties in the country. Historically, there have been two main parties: the Basotho National Party and the Basutoland Congress Party. Other parties are the Marema-Tlou Freedom Party and the United Democratic Party.

3. National budget

The budgetary system consists of the recurrent and capital budget administered by the Ministry of Finance. Budgets are presented to Parliament by the Ministry of Finance annually. The fiscal year runs from April 1 to March 31.

The main sources of revenue are custom and excise duties, sales tax and income tax. Financing for capital improvements depends on loans and grants from foreign donors. The Government's contribution often is in the form of land and counterpart contribution.

The proposed total expenditure for the current financial year 1984/85 is M 314.63 million. It is projected that of this budget, M 124.05 million will be spent on recurrent personnel costs, M 60.25 million for statutory costs, M 11.14 million on administration and M 119.19 for capital needs. Seventy-three percent of the budget is to be financed from recurrent revenue and twenty-seven percent from grants, concessionary fees and commercial loans. (See Table 3.)

4. Government policies regarding agriculture

The Government of Lesotho (GOL) has initiated many projects needed to increase rural incomes, employment and food production. GOL is providing a network of rural infrastructures including access roads, airfields, health clinics and village water supplies. It has also provided training for rural people; over half of the inhabitants have received eight years of formal training, an effort which has resulted in a literacy rate of more than 75 percent.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 3: National Budget
(M million)

	Budget 1983-84	Budget 1984-85	Percent change compared 1983-84
Recurrent heads	113.73	124.05	+9.1
Statutory expenditure	44.90	60.25	+33.8
Administration account	8.95	11.14	+24.5
Capital	137.14	119.19	-13.1
Total expenditure	304.72	314.63	+3.3
To be financed as follows:			
Recurrent revenue	166.43	230.20	+38.3
Development aid:			
Grants	59.24	46.83	-12.7
Concessionary fees	40.21	35.10	-12.7
Deficit (i.e. commercial borrowing)	38.84	2.50	-93.5

Source: Ministry of Finance, Government of Lesotho, 1984.

To attain its goals, GOL committed resources to coordinate the marketing of agricultural produce and sales of production inputs in the Coop Lesotho. Sales of wool, mohair, hides and skins are handles through the Livestock Products Marketing Services (LPMS). Agricultural Credit is channelled through the Lesotho Agricultural Development Bank (LADB).

A continuing emphasis is placed on sound agricultural policies. GOL engaged the Lesotho Agricultural Sector Analysis, a project sponsored by USAID from 1977 to 1981, which made a major contribution in assisting Lesotho to define and reconsider its long-term agricultural policies. The objectives identified were:

- To assist farmers, large or small, to become efficient and commercially viable producers of agricultural products;
- To promote decentralised rural development stressing self-reliance and the participation of locals in project development and implementation;
- To provide labour-intensive programmes or rural public works for infrastructural development;
- To promote the development of cooperatives and parastatal marketing institutions to ensure the best service of farmers' interests; and
- To assist LADB to become an effective lending institution.

5. Membership in international organisations

Lesotho plays a very active role in international affairs and is a member of a number of international and inter-governmental organisations, including:

- The Organization of African Unity;
- Southern African Development Coordination Conference;
- United Nations;
- Food and Agricultural Organization;
- United Nations Save the Children Fund;
- World Health Organization;
- United Nations Educational, Scientific and Cultural Organization;
- Commonwealth of Nations;

- Customs Union of South Africa: and
- Nonaligned Movement.

D. Economic Overview

Lesotho's economy is unavoidably interlinked with that of the RSA and is directly impacted by changes in the RSA's economy.

There are four major interrelated problems facing Lesotho in 1984: increasing unemployment, a rising government debt, a lack of investment and a growing balance of payments deficit.

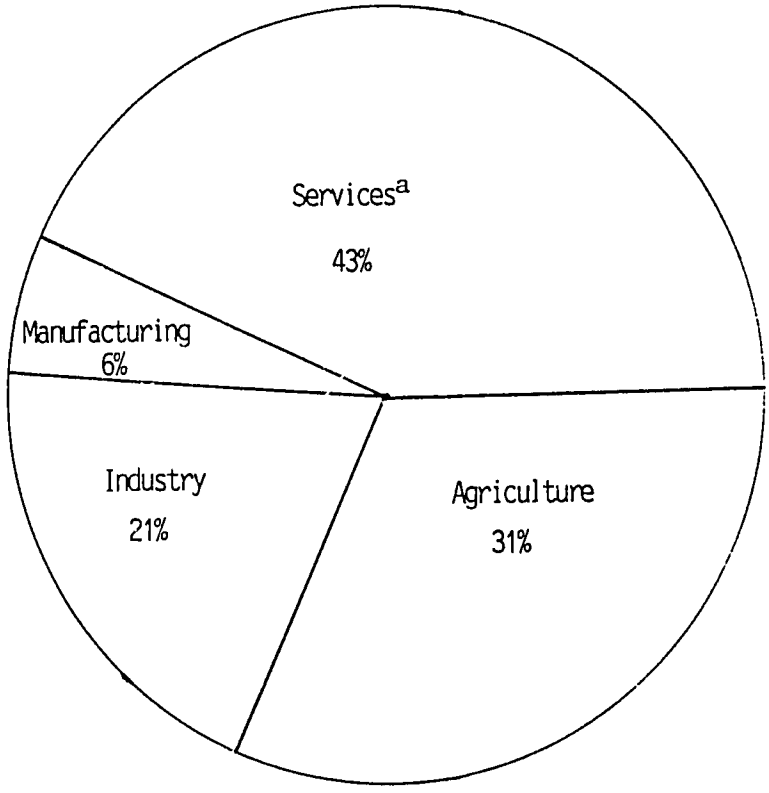
1. General indicators

Poor statistical data requires that national income estimates and trends be interpreted only as approximate indicators. It is estimated that in 1977/78 the Gross Domestic Product (GDP) as a factor cost (in 1980/81 prices) grew from M 140 million in 1974/75 to M 195 million, an increase of 40 percent. In 1980 it reached M 445 million.

Lesotho's balance of payments position illustrates the extent of the country's economic interrelationship with the RSA. The country has a growing deficit in the balance of trade which is mainly financed by remittances from migrant workers (62 percent), customs and excise duties (17 percent) and aid inflows (13 percent). The trade deficit grew from M 75.1 million in 1974/75, to M 189.9 million in 1977/78 when it was 8 percent larger than the total GDP. Through migrants' remittances there have been improvements in the deficit; for instance in 1977/78 there was a M 4.7 million improvement over 1976/77. An examination of the 1981 data reveals the sources of the GDP to be as follows: agriculture, 31 percent; industry, 21 percent: manufacturing, 6 percent; and services, 43 percent. (See Figure 4.)

2. Financial system

In Lesotho the financial system consists of the Lesotho Monetary Authority, Lesotho Bank, Barclays Bank, Standard Bank and Lesotho Agricultural Development Bank. In addition to commercial banks, there are some Life Insurance Banks. There is a Building Finance Cooperative which extends loans to Basotho for building homes. The assets of commercial banks consists of treasury bills, loans and other investments. Their main liability is borrowing from the Monetary Authority. In Lesotho foreign exhange is not a problem, because the maloti is tied to the rand and required purchases are made through RSA. The local currency or maloti exchange rate in August 1984 was approximately 1.28 per one United States dollar.



[a]Services include the unallocated share of GDP.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 4: GDP by Source, 1981

Source: IBRD/The World Bank, World Development Report 1983 (New York: Oxford University Press, 1983.)

3. National Development Plan

The Third Five Year Development Plan (1980-1985) outlines the goals and objectives of national development. It aims to transform Lesotho's economy from external dependence to local initiatives. The plan is to intensify the training of rural people and the utilisation of scarce resources.

The declining productivity of Lesotho's agricultural sector is unacceptable, from the standpoint of both national policy and returns to the individual farmers. This situation is recognised by the GOL and is demonstrated by the February 27th, 1981 statement of the Prime Minister, Dr. Leabua Jonathan: ". . .Lesotho would be self-sufficient in food production in five years' time if projected plants materialize."[1]

The country's agricultural research agenda is contained in the Third Five Year Plan.[2] The objectives listed for agricultural research are:

- Conduct of farmer-oriented research;
- Inclusion of all areas of agricultural research instead of just agronomic research;
- Integration and direction of all agricultural research activities and the training of research personnel; and
- Coordination of all research activities to avoid duplication.

Some of the specific areas of agricultural research to be addressed are:

- Irrigation for self-sufficiency in vegetable production;
- Winter vegetable production, including intercropping and post-harvest techniques;
- Varieties and fertilisation of winter fodder crops;
- Grazing experiments, along with the introduction of improved grasses and legumes, and the use of fodder crops;
- Cultivation machinery, crop residue management, rotations, and weed control;
- Control of field and storage pests and diseases; screening chemicals, and the obviation of disease outbreaks in certified seed;
- Weeds and weed control;

- o Livestock improvement including animal health, feeding and management; and

- o Conservation research.

Research currently is underway on most of these objectives. However, to achieve self-sufficiency, not only will it be necessary to further strengthen the RD but also to develop within Extension Service the capability to effectively desseminate research findings to farmers. This will involve using numerous extension methodologies, including on-farm result demonstration techniques.

E. Agriculture

1. Land use

Lesotho's agricultural land is divided into four agricultural zones, with different land use recommendations according to the availability of essential production factors. The Mountains, which are primarily the rangeland area of Lesotho, are suitable solely for livestock grazing; the Foothills are suitable for mixed agriculture of livestock and crop production, especially fruits and vegetables; the Lowlands are particularly suitable for crop production. The Northern Lowlands are good for maize and beans, while the Southern part is suitable for drought-tolerant crops like fodders, sorghum, wheat and sunflower. The Orange River Valley is used for irrigated crops such as maize, beans and vegetables. (See Table 4.)

Lesotho's agriculture is mostly subsistence even though it is common practice for farmers to sell the surplus produced over and above that required for their immediate use. Most farm work is done with oxen power and by hand.

2 Land tenure

Traditionally, land ownership has been communal in Lesotho. Powers of allocation were vested in a Chief who allocated each household a site to build its residence and three 0.8 ha fields for crops. The animals are grazed on communal lands. This kind of land tenure has positive and negative attributes. From a positive viewpoint, all people are considered equal and have a right to land. On the negative side, the system discourages investment in and improvement of the land. This tradition has also given rise to individuals having many scattered small plots of land which cannot be operated economically.

Lesotho passed a Land Tenure Act in 1979 which attempted to provide the following:

- o A consolidation of viable portions of previous land legislation;

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 4: Land Use

Category	Area (km^2)	Percent of Total Area
Cropland	4,290	13
Cropped		
1978/79	3,048	
1980/81	2,981	
Fallow		
1979/80	1,242	
1980/81	1,309	
Non-arable (grazing)	28,710	87

Source: Jerry B. Eckert, Toward the Year 2000, LASA Research Report No. 10 (Maseru: Government of Lesotho, 1982).

- An improvement in the security of tenure;
- The creation of a limited market in land use rights; and
- The creation of conditions under which land use rights can be transferred, inherited and used as collateral.

Underlying the specific changes was a desire to increase land use efficiency and to structure a tenure system which would accommodate modernisation and growth for both urban and rural areas.

3. Principal crops

Estimates of the total national area planted with the four major crops--maize, sorghum, wheat, and pulses--are included in Table 5. During the mid-1960s there was a steady increase in the total land area under cultivation. This increase was at the rate of 0.8 percent annually, a trend consistent with the growing population of rural residents who depended on home-produced food. However this trend was reversed in the 1970s, and the area planted began to decrease. It is believed that this was due to an increased dependence on migrant remittance as a substitute for crop husbandry.

4. Principal livestock and animal products

The most important livestock in Lesotho are: sheep, goats, cattle, poultry, horses, donkeys, and pigs. There are opportunities to exploit the economic potential of these livestock through an enhanced extension education programme for farmers with more emphasis on animal husbandry and farm management.

It is important to note that, until the mid-1970s, Lesotho was a net exporter of livestock. The increase in mine wages, with a subsequent shift in the labour force, reversed that situation. The trade balance shifted even more in 1975 when cattle imports reached a historic high. The trend continued to such an extent that the GOL was forced to impose a levy of M 20 per large stock and M 10 per small stock imported into Lesotho. These high levies were justifiable in light of the damage caused to Lesotho's rangeland by overstocking.

Basotho keep livestock for many reasons. They are used for farm power, in bohali (marriage payments), in ceremonial slaughter and also as a show of wealth. As a result the annual offtake for cattle is very low, at approximately 12 percent. (See Table 5.) Lesotho's altitude, cool climate and relatively low humidity contribute to the production of the highest-quality wool and mohair in the region. Mohair wool is the leading export of Lesotho, which ranks fourth or fifth in the world in production of this commodity.

5. Fisheries

Since Lesotho has no access to the sea, fishing is done in the rivers, lakes and artificial dams.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 5: Indicators of Agricultural Productivity, 1980-81

Crops	Area (ha)	Average Yield (100 kg/ha)	Metric Tons
Maize	124,812	8.47	105,674
Sorghum	60,016	7.95	47,729
Wheat	19,932	8.52	16,993
Pulses	12,057	5.79	6,715

Livestock	Total No. of Heads	Offtake	Percent Offtake
Cattle	590,021	70,000	11.9
Sheep	1,168,404	340,000	29.1
Goats	766,535	240,000	31.3

Sources: Kingdom of Lesotho Annual Statistical Bulletin, Bureau of Statistics; 1981, p.62; Horn, Nancy E. and Elizabeth Brabbs, Lesotho Country Profile, 1984, p.17; World Bank, Economic Memorandum on Lesotho, 1983.

Aquaculture, being very important to the balanced diets of Basotho, has recently been given a high priority by the GOL. The Government has imported species of fish that can be grown successfully using agricultural and animal wastes without sophisticated skills. The Fisheries Section of the Ministry of Agriculture provides extension services and fingerlings at very nominal costs to subsistence farmers.

The Fisheries Section is headquartered in Maseru, with fully-equipped substations in Leribe and Mafeteng. Farmers have built ponds for fish farming: these ponds generally depend on rainfall. However, a few farmers have purchased pumps and lift water from rivers to maintain the level of their ponds.

6. Principal agricultural production systems

Lesotho possesses very little industry. With the vast majority of people living in the rural areas, rural development with an agricultural focus is the most immediate, necessary and sensible means to increase nationally-produced wealth.

At the beginning of the Second Five-year Development Plan (1975/80), agriculture contributed about 45 percent to the Gross Domestic Product (GDP). Its contribution was evenly divided between livestock and crops. The majority of crop production is subsistence, though most people will market about one-third of their produce. The livestock sector exports 65 percent of its total produce. In 1975, agriculture employed 85 percent of the total labour force, but only 5 percent of that was considered adequately employed by the criteria of receiving a net income of M 150 per annum.

Traditionally all agriculture recommendations were the result of on-station research trials which resulted in blanket recommendations for the country.

The Ministry of Agriculture (MOA), realising the shortcomings of blanket recommendations, decided to adopt CIMMYT's recommendation of on-farm adaptive research. The MOA mounted the Farming Systems Research Project (FSRP) in 1979 with the help of USAID. FSRP examines farmers' enterprises as a whole, unlike the former, traditional programmes, which were discipline-oriented. The main objectives of the FSRP are:

- Testing and introduction to farmers of innovations that explicitly consider biological, technical and human factors; and
- Development of the capacity of the Research Division to deal with major problems that constrain Lesotho's agricultural production.

Farmers were divided into Recommendation Domains according to their possession of oxen and essential machinery or lack thereof. A series of enterprise combinations, specific for groups of farmers within a designated domain, were recommended. Inputs required to test these combinations were provided on a cost-reimbursement basis.

In addition to enterprise combination, another focus has been to conduct on-farm trials throughout the country. District Crops Officers (DCOs) have attended courses on on-farm adaptive trial methodologies conducted by the Research Division staff. Some of the DCOs have also attended courses conducted by the University of Zimbabwe and CIMMYT.

Good on-farm trials need to be backstopped by well-planned and executed on-station work which is conducted at substations located in the various agro-ecological zones throughout the country.

Livestock production under traditional management and communal grazing practices has been skewed toward local breeds, which were considered hardy enough to withstand adverse conditions such as travelling long distances in search of pastures and water, and were being cared for by untrained herdboys. Under these conditions it has been very difficult to achieve improvements in the livestock sector.

The Ministry of Agriculutre has recently undertaken an initiateve to improve livestock production in Lesotho by establishing:

- o Sheep studs stocked with purebred Merinc animals in both Foothills and Mountain regions. Farmers may purchase animals from the sheep studs to improve their flocks;

- o A feedlot where farmers can sell excess cattle for fattening. This should reduce overstocking of the rangelands. The farmers are encouraged to use the cash received to purchase improved breeds which would be more profitable;

- o A dairy enterprise where farmers may sell their milk, and purchase purebred dairy animals such as Friesian and Jersey cows. The farmers may also bring their cows to be serviced by government-selected bulls; and

- o A poultry breeding station which supplies farmers with chicks, broilers and layers at very reasonable prices. Egg circles have been developed in districts for the marketing of poultry products.

7. Agricultural marketing and credit

a. Marketing

Marketing agricultural products is problematic. The problems are intensified by the close proximity to the Republic of

South Africa which produces similar products through a well-developed, modern agricultural industry. The price structure in Lesotho is therefore unavoidably linked with that of the RSA. As a result, coordinated marketing arrangements for the sale of wool and mohair have been implemented.

Lesotho has a very small urban population: barely 13 percent of the total. Since the market for staple food products is virtually dependent on the size of this population, this market in Lesotho is quite restricted.

In the past, grain sales were made through licensed merchants who bought the harvest at free market prices and stored the produce in their own facilities. Wheat grown in the Lowland areas was generally sold to the South African Wheat Industrial Control Board for milling. Prices paid to growers varied widely and suddenly, being fixed by the merchants on the basis of their assessment of disposal prospects and loss risks, in the case of wheat, as a result of cleaning and grading.

In the Mountain areas the merchants often acted as a bank for the growers, but the limited amount of maize, sorghum and wheat purchased by them resulted in a lack of incentives to expand cultivation of these crops; growers also suffered losses even in the years when production was good, since the price they received was very low. This critical situation led the Government to set up the Produce Marketing Corporation (PMC) and to place price controls on staple foods. In 1976, the import of maize and maize meal was also put under the control of the PMC.

There was a change in the government agricultural policy in 1980. Instead of partial intervention through control of the prices paid to growers, the Government started to exert greater overall influence on the various aspects of the rural sector.

The PMC was abolished and a start was made at the formation of Primary Cooperatives at the village level with the goal of stimulating an independent development process from the "bottom up". The basic idea was that improvements in production techniques would permit farmers to raise marketable surpluses, thus initiating a process of capital accumulation needed for self-financing of agricultural development.

The Coop Lesotho was responsible for the programme. This public body is under the control of the Minister of Cooperatives and Rural Development, but is also connected with the Ministry of Agriculture and Marketing. The capital of the Coop comes both from the registration fee each member of the Primary Cooperative must pay and also from donor institutions.

The Coop buys all agricultural, food and industrial products from farmers and sells them agricultural inputs, through its network of 56 retail branches, 44 of which are open all year, and 12 from October to

May. From the retail branches the farmers can also obtain wood, charcoal, building materials, and animal feed.

The Coop buys agricultural produce at fixed prices, established before sowing, according to the terms of the Ministry of Agriculture's Marketing Act. For the marketing of produce, the Coop operates through agents who work on commission.

The Coop imports exclusively through the RSA and sends 90 percent of its exports to that country. Most of the maize and sorghum purchased or imported is sold to local millers, but in 1981-82 about 20 percent of it was sold as grain, especially in the mountain areas in Lesotho.

Maize milling is almost exclusively done by the Lesotho Milling Company (LMC) while Lesotho Flour Mills does most of the wheat milling. The LMC mill is at Maputsoe in the North of the country, where most of the maize is grown. With its annual milling capacity of 48000 MT, this mill provides about one-half the country's meal needs. The supply of raw material is ensured only partially from local sources, since tonnages from these sources vary markedly from year to year. The remainder has to be imported from the RSA. The LMC has virtually no storage facilities; its storage capacity does not exceed two days' worth of production.

The Lesotho Flour Mill is state-owned but managed by a concessionaire. The mill has an annual capacity of 42000 MT of wheat and storage for 30000 MT. The mill has had supply problems because domestic production provides only 10 percent of the needs. Because of this, a significant quantity of wheat has been imported from the RSA and other countries.

The Coop Lesotho plans to install hammer mills at its sales outlets so that farmers can process their own production.

The Government fixes the selling price of maize meal and of other cereals. The same price is fixed for the whole country for the entire year. The purchase price of wheat is for that delivered to Maseru, on the basis of minimum lots of three tons. In actual practice, when fixing prices, especially for food products that are widely consumed, the Lesotho Government has only limited room to manoeuvre, since it cannot ignore the prices fixed by the RSA. It otherwise would be faced with the problem of contraband on a large scale.

b. Credit

Agricultural credit prior to 1977 was supplied through many financial institutions and sources, including: credit unions, thrift societies, commercial banks, The Agricultural Development Fund, Coop Lesotho and the Credit Union League. Most of these were very poorly capitalised, and their effectiveness was hampered by low levels

of managerial skills. As a result loan recovery rates were low and funds were often not available for qualified farmers.

The traditional system of land tenure did not allow an operating land market. Farmers could not, therefore, use land as collateral in securing loans. The Land Act of 1979 attempted to rectify this situation.

The Lesotho Agricultural Development Bank (LADB) was established in 1976 by an Act of Parliament, and began functioning in 1980. It now coordinates all agricultural credit programmes.

All credit supplied to farmers is in-kind, not cash; it may be seeds, fertilisers, chemicals, livestock or farm machinery. All crop loans are seasonal, and payment in full is due at harvest. Only loans for small capital expenditures such as ox-drawn equipment are long-term.

LADB also has an element of a Credit Insurance Scheme for natural disasters, to avoid undue suffering by farmers.

8. Major problems related to the natural resource base

The soils of the arable land are of low fertility and have been further damaged by severe erosion.

Since most of the country is in mountainous terrain, the infrastructure is limited, and the transportation of agricultural products and inputs is extremely difficult. The road network is largely confined to the western Lowlands.

Drought presents a real threat to agricultural production since Lesotho lies in the Southern African drought zone. This has been particularly evident in recent years.

Shortage of labour at peak periods of agricultural production is a problem, as is serious underemployment during slack periods. Male labour migration to South Africa has added to the serious shortages and to poor-quality farm management.

Even though women remain in Lesotho to farm, they still have to await instructions from the men who are away in the mines. They are not allowed to make decisions despite the fact that they are advised by extension workers. Waiting for indications from decision-makers delays operations: the available labourers are unable to do crucial tasks such as planting and weeding in a timely manner. Statistics have indicated that the time of weeding has a significant impact on crop yields.

9. Food balance sheet

Lesotho is a net importer of almost all staple food products. According to the Marketing Division, 30 percent of the

maize demand is satisfied by imports and 10 percent by international aid. The figure is even higher where wheat is concerned, with imports covering 60 percent of the demand. Only in the case of sorghum is the import figure very low, at around 2 percent.

There is no reliable, current, quantitative data on Lesotho's food consumption, production or importation. The estimated per capita cereals consumption as calculated and reported by Jerry B. Eckert et al in 1982 are: maize 120 kg, sorghum 35 kg, and wheat 55 kg. The total cereals production as reported by the Bureau of Statistics for 1980/81 is as follows: maize, 10,5674 MT, sorghum, 47,729 MT and wheat, 16,993 MT.

The food and nutrition situation in Lesotho can be summarised with several general conclusions. Average consumption of energy and protein appear to be adequate by conventional standards, and are somewhat higher than in other parts of Africa. Significant nutritional problems do arise, however, because of the very high reliance on cereals as staple foods. Finally, there is a high level of dependence on imported food to balance the needs of the country.

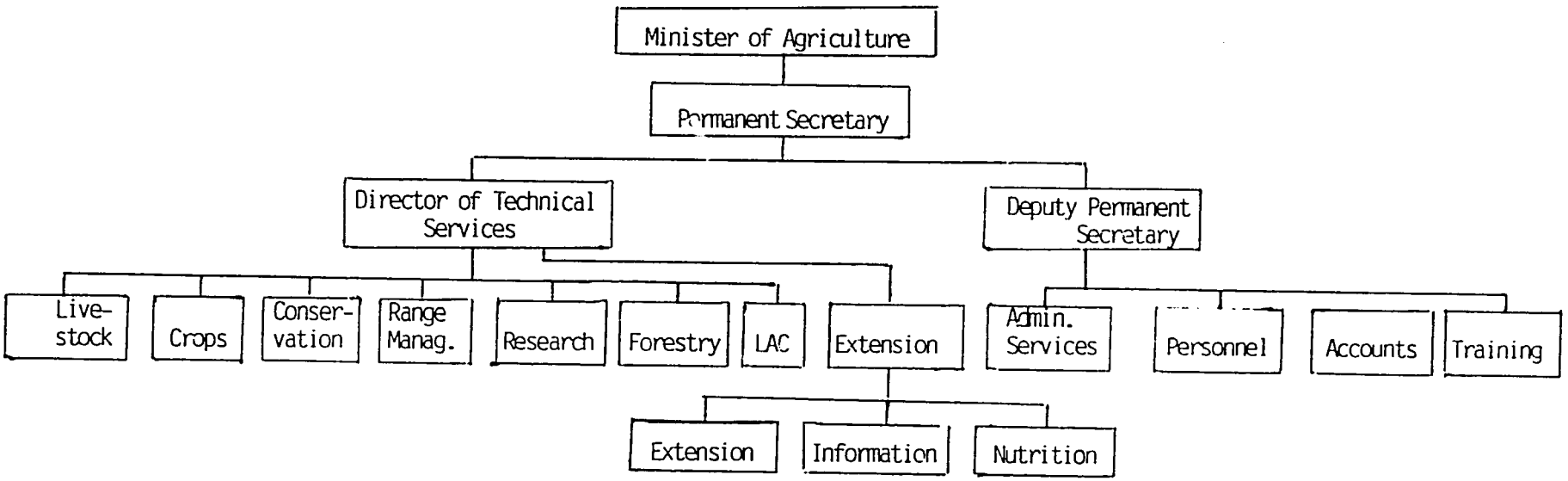
10. Ministries responsible for agriculture

The Ministry of Agriculture with its specialist divisions has the major responsibility for agricultural development and marketing. The major programme areas and 1984/1985 budget are shown in Figure 5 and Table 6. It should be noted, however, that several other Government Ministries and parastatals work collaboratively with the Ministry of Agriculture; for example, the Coop Lesotho, which provides agricultural inputs, had its origin as a credit section of the MOA.

Other Ministries with direct impact on agriculture include Cooperatives and Rural Development, Health, Interior and Education.

The Ministry of Education has introduced agricultural courses in high schools. The National Teacher Training College works very closely with Lesotho Agricultural College to develop curricula for high school agricultural teachers.

The Ministry of Interior is responsible for the allocation of land. In 1979 this Ministry successfully guided a new Land Act through Parliament which is expected to have a lasting, positive impact on agricultural development.



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 5: Organisation Chart of the Ministry of Agriculture

Source: Ministry of Agriculture, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 6: Ministry of Agriculture 1984/85 Budget

Programme	Budget (Maloti)	Percent of Total
Administration	4,076,290	35.2
Livestock	1,295,160	11.2
Crops	687,050	5.9
Extension	684,980	5.9
Conservation	1,046,560	9.0
Agricultural College	742,190	6.4
Research	513,160	4.4
Economics and marketing	710,080	6.1
Range Management	166,520	1.4
Technical Operations Unit	1,674,370	14.4
TOTAL	11,596,360	100

Source: Estimates of the Kingdom of Lesotho for the year from 1st April 1984 to 31 March 1985.

III. AGRICULTURAL RESEARCH INSTITUTIONS

A. Overview of Agricultural Research in Lesotho

Agricultural research for Lesotho is conducted by the Research Division (RD) of the Ministry of Agriculture. The MOA Divisions of Livestock, Crops, Soil Conservation and Range Management primarily provide technical and educational services: for the purposes of this assessment, they are classified with the extension services and described in Chapter V.

B. Lesotho Agricultural Research Division

1. Organisational structure and purpose

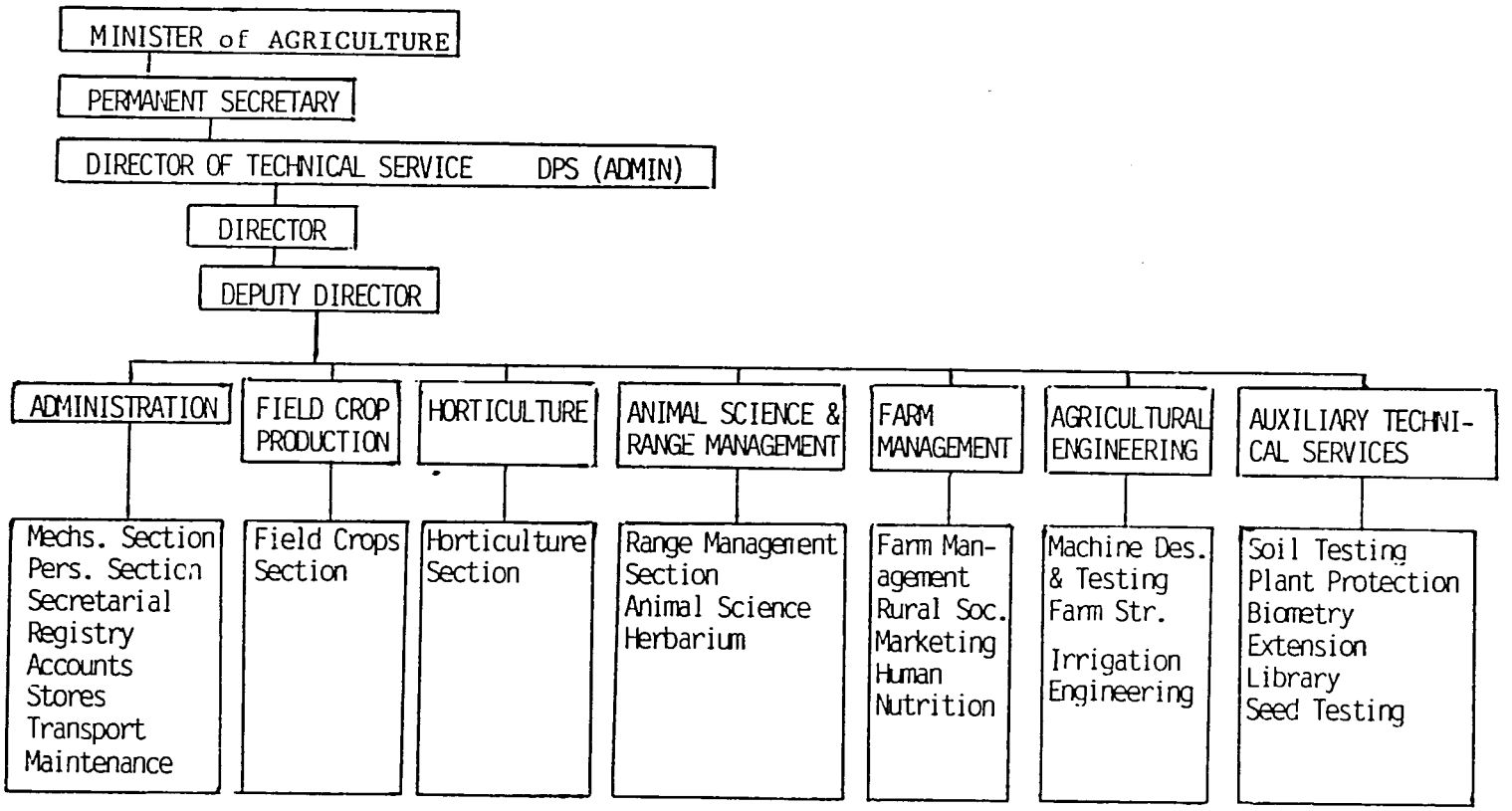
The Lesotho Agricultural Research Division is in the Ministry of Agriculture. It is administered by a Director who reports through the Director of Technical Services to the Permanent Secretary of Agriculture. The current organisational structure is shown in Figure 6.

The present institution was established in 1952 as a section of the Crops Division of the MOA. The main station was established in Maseru: field stations were located at Machache, Matsieng, Mafeteng, Tsakholo, Teyateyaneng, Leribe and Mokhotlong to encompass the various agro-ecological zones of Lesotho.

The original mission of the experimental station was solely to test agricultural technologies developed in other countries before they were recommended to Basotho farmers.

The station's mission developed gradually to include range management and irrigation work with field crops and vegetables. In early 1976 the Research Station consisted of the following sections: Dryland Crop Research, Irrigation Research, Pasture Research, Herbarium and Botany, Soil Fertility Laboratory, Seed Testing and Multiplication and the FAO Fertilizer programme. These sections, unfortunately, tended to work separately, resulting in uncoordinated recommendations and duplication of efforts. In most cases, findings observed were not recorded. The result was a lack of reliable data and information to transmit to farmers. Even when research indicated profitability, the lack of proper coordination between programmes led to failures in the dissemination of information. These conditions led to the creation of the Agricultural Research Division by the MOA in 1979. The new division was given the responsibility of conducting all relevant, applied agricultural research for Lesotho. The first activity of the new division was to mount an aggressive training programme to alleviate the acute shortage of competent staff.

The guiding principle of the Research Division is to develop agricultural technology which will result in:



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 6 : Organisation Chart of the Agricultural Research Division

Source: Research Division of the Ministry of Agriculture, 1984.

- o Increasing agricultural productivity:
- o Raising farmers' income: and
- o Improving the rural population's quality of life.

The RD's emphasis is on a systems approach, researching farm enterprises as total entities with resulting combination package recommendations.

2. Research programmes

The Division's programme focuses on applied research in crop and animal production, including aspects of communications and rural sociology. Table 7 gives a summary of the principal research activities, funding, and staff. The programmes currently are funded from three sources: MOA: USAID; and FAO.

a. Wheat

The wheat programme concentrates on variety adaptability trials in all agricultural zones, testing both winter and summer varieties. The effects of time of planting, seed rates and response to fertilisation are examined. The seed multiplication unit does no breeding research, but assists farmers to multiply imported seed.

b. Maize and sorghum

Maize and sorghum are the Basotho's staples. Since maize is grown in all areas, in spite of the diverse climatic conditions, the Research Division has conducted variety trials in all regions. Recent trials have identified cold-resistant highland varieties which do well in the mountains.

Sorghum trials have shown red sorghum to be high-yielding. However, being new to Lesotho, red sorghum has not yet been widely accepted by farmers.

c. Pulses

The emphasis in the pulses programme is on varietal testing. The researchers have found that the most productive beans are the small white Haricots and speckled Sugars. The most productive peas are Black-Eyed Susan and Basotho Green, local varieties of cowpeas. The Pinto bean, a recent introduction, is also proving to be very successful.

d. Fruits and vegetables

The Division conducts varietal trials under irrigation on cabbage, asparagus and tomatoes at the main station. Considerable work on seedling production and stand establishment has been done.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 7: Agricultural Research Institutions: Funding, Location, Activities and Staff, 1984

Institution	Funding		Location	Principal Research Activities	Number of Staff				
	Source	Amount (US$)			Professional	Administrative	Technical[a]	Support Services	Total
Lesotho Agricultural Research Division	MOA	403,369	Maseru	Maize	.5	3	2		
	USAID	1,775,893		Sorghum	.5	-	2		
	FAO	36,000		Pulses	1	-	2		
				Wheat	1	-	1		
				Cattle	1	-	1		
				Sheep	-	-	2		
				Goats	-	-	2		
				Range	1	-	2		
				Pasture	-	-	2		
				Farming systems	9	-	10		
				Rural technology	1	-	2		
TOTAL		2,215,262			15	3	28	21[b]	67

[a] Technical = diplomate.

[b] Non-technical staff working with all programmes.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

- o Proper land and seedbed preparation:
- o Soil moisture accumulation and retention:
- o Fertiliser use and placement, especially in relation to seed:
- o Uniform plant population:
- o Crop varietal improvement:
- o Fodder production:
- o Weed control:
- o Cropping systems for better land utilisation:
- o Grain threshing: and
- o Suitable farm equipment to perform the required practice.

The RD has developed a prototype area in each of three geographic zones: Lowlands, Foothills and Mountains. The FSRP works with farmers in each prototype area to persuade them to use research recommendations on all crops and livestock enterprises. The emphasis of FSRP is on enterprise combination trials.

i. Farm management

The farm management programme's major activities include a farm records programme, processing and analysis of collected farm records data, costs and returns analysis and marketing analysis. Selected "trial enterprise combination farms" follow-up is one of its high-priority tasks.

i. Extension and communication

The extension and communication section's major objectives are to:

- o Provide training and guidance field extension staff in principles and methods of extension education to facilitate transfer of research findings to village farmers:
- o Design, test and monitor alternate methods for involvement of village farmers in cooperative agricultural production and management:
- o Design, test and monitor alternate methods whereby communications can be improved among project staff, field extension staff, and farmers: and

- o Systematically obtain evaluative feedback from village farmers, field extension staff and others concerning new farm systems.

k. Rural sociology

The objective of this programme are to conduct surveys and analyse social data which will assist the researchers in solving production problems and will provide insights which will help increase farmer acceptance of different plant varieties and agricultural technologies.

3. Human resources

The Lesotho RD is headed by a Director of Research who is assisted by two people, a Deputy Director and an Advisor who also is the FSRP team leader.

Table 8 gives the summary of professional staff effort assigned to each activity. Of the total, 16.7 percent is devoted to food crop research, 5.6 percent to livestock, 5.6 percent to range and pasture, 50.0 percent to farming systems, 16.7 percent to general administration, and 5.6 percent to rural technology.

There are 67 people currently working in the RD, including three FTE administrators, 15 FTE professional staff members, 28 technicians and 21 support staff members. (See Table 9.) There are nine expatriates on the staff, serving as professional researchers.

The professional disciplines represented on the staff are given in Table 10 as they relate to programme areas. The disciplines represented on the staff are: Agronomy, Animal Science, Range Management, Agricultural Engineering, Agricultural Economics, Agricultural Education, and Administration. Table 11 details this information by sex and degrees held. Of the 18 professionals, six are females and 12 are males.

Currently, there are 12 professionals and two technicians in training. All 12 professionals are being trained in the United States of America. The two technicians are currently enrolled at LAC. The RD's long-term training plans include 17 staff members at degree levels as follows: four at the Doctorate level, seven at the Master's level and five at the Bachelor's level. The RD also plans to train one person at the Diploma level. (See Table 12.)

It should be noted that the research staff spend approximately 70 percent of their effort on-farm and 30 percent on-station. This demonstrates the division's commitment to the farming systems concept of on-farm, adaptive research.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 8: Summary of Professional Staff Effort and Source of Funds by Programme Area of Agricultural Research, 1984[a]

Programme Area	FTE[b]	Source of Funds	Percentage of National Research Effort
Food Crops		GOL	
Maize	.5		2.8
Sorghum	.5		2.8
Pulses	1		5.6
Wheat	1		5.6
Subtotal, Food Crops	3		16.7
Livestock/Range		GOL	
Cattle	1		5.6
Range	1		5.6
Subtotal, Livestock/Range	2		11.1
Other Programme Areas			
Farming systems	9	USAID	50.0
General administration	3	GOL	16.7
Rural technology	1	GOL, FAO	5.6
Subtotal, Other Programme Areas	13		72.2
TOTAL	18		100

[a] Professional staff are those with a BSc degree or above.

[b] FTE = Full Time Equivalent.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 9: Total Agricultural Research Staff, 1984

	Administrative	Professional[a]	Technical[b]	Support Staff	Total
Total Authorized Posts	3	18	30	21	72
Positions Vacant	-	-	-	-	-
Nationals (Citizens)					
Staff in training	-	12	2	-	14
Staff on long-term leave	-	-	-	-	-
Number of nationals currently in authorized posts	3	6	28	21	58
Expressed as a percent of authorized posts	100	33	93	100	81
Expatriates					
Serving in authorized posts[c]	-	-	-	-	-
Expressed as a percent of authorized posts	-	-	-	-	
Not in authorized posts	-	9	-	-	9
Total number of expatriates	-	9	-	-	9
Total Number of Staff	3	15	28	21	67

[a] Professional = BSc or above.

[b] Technical = diplomate and certificate.

[c] Irrespective of source of funding.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 10: Disciplines of Professional Staff Related to Agricultural Research Programme Areas, 1984

Programme Area	Discipline Areas	Number of Professionals						
		Nationals			Expatriates			
		BSc	MSc	PhD	BSc	MSc	PhD	Total
Food Crops								
Maize, sorghum, pulses, wheat	Agronomy	1	-	-	-	1	1	3
Livestock								
Cattle, sheep, goats	Animal sciences	-	-	-	-	-	1	1
Other								
Rangeand Pastures	Range management	1	-	-	-	-	1	2
Rural technology	Agr. engineering	-	-	-	-	1	-	1
Administration	Administration	1	2	-	1	-	-	4
Farm management	Agr. economics	3	-	-	-	-	2	5
Research information/ extension	Agr. education	-	1	-	-	1	-	2
TOTAL		6	3	0	1	3	5	18

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 11: Summary of Technical Skills of Agricultural Research Professionals by Degree Held, 1984

Discipline Areas	Nationals								Expatriates								Total
	BSc		MSc		PhD		Subtotal		BSc		MSc		PhD		Subtotal		
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	
Agronomy	1	–	–	1	–	–	1	1	–	–	–	1	–	1	–	2	4
Range management	–	1	–	–	–	–	–	1	–	–	–	–	–	1	–	1	2
Animal science	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1
Agr. economics	2	1	–	1	–	–	2	2	–	–	–	–	–	2	–	2	6
Agr. engineering	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1
Agr. education	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	2
Administration	1	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–	2
TOTAL	4	2	–	3	–	–	4	5	1	–	1	2	–	5	2	7	18

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 12: Training Plans for Staff of Research Institutions, 1984

Level	General Field of Study											
	Crop Science		Animal Science		Veterinary		Economics		Other		Total	
	F	M	F	M	F	M	F	M	F	M	F	M
Current Situation												
Doctorate	–	1	–	–	–	–	–	–	–	–	–	1
Masters	2	2	2	–	–	–	–	1	–	1	4	4
Bachelors	–	2	1	–	–	–	–	–	1	–	2	2
Diploma	–	2	–	–	–	–	–	–	–	–	–	2
Short Courses:												
Horticulture	–	1	–	–	–	–	–	–	–	–	–	1
Marketing	–	–	–	–	–	–	1	–	–	–	1	–
Future Plans for Training												
Doctorate	1	1	–	1	–	–	1	–	–	–	1	3
Masters	1	1	1	1	–	–	1	2	–	–	3	4
Bachelors	1	1	1	1	–	–	–	1	–	–	2	3
Diploma	–	–	–	–	–	–	–	–	–	1	–	1

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

4. Research facilities

a. Branch stations

There are seven field stations where crop research is conducted. These stations are approximately 2.5 ha each. Field stations are staffed only with caretakers who have limited capabilities. There are no buildings, except for the caretakers' houses, and no equipment.

The RD also has three prototype areas, one in each of three geographical zones: the Lowlands, the Foothills and the Mountains. These sites are used by the FSRP for on-farm enterprise combination trials. In each prototype area the Division has a small field station with four buildings, two of which house extension workers, and a third which houses transient researchers and can accommodate six people. The fourth building is a multipurpose building used mainly for farmer training and storage. The capacity for a classroom format is about 75. These are new buildings in excellent conditions.

b. Library

The library is located in the main agricultural research building. It is a modern facility constructed in 1980. It is the official MOA library and the central repository for all local agricultural publications. It has access to the FAO information systems, and has established linkages with the RSA printing office and other external sources of agricultural information. The library has some 10,000 volumes. It has up-to-date holdings of some of the leading crop, soil, range science and animal science journals. In total it has about 80 titles of annual reports and periodicals.

The library is located in one room which, in addition to housing the stacks, has individual reading stations for private study. At present the space is adequate, but plans should be made for expansion.

The library is used not only by the research staff but by others from the MOA and by students and staff from LAC and NUL.

c. Experimental farms

The main station in Maseru has 22 ha of arable land. The majority of the land has been levelled to eliminate dead furrows, and a system for research plot assignment has been developed. Eight ha are used for experimental plots, five for seed multiplications, seven for irrigated vegetable research, and two for fodder production.

d. Buildings

The RD has good office and laboratory space at the main Research Station in Maseru. This includes administrative offices, a

conference room with a capacity of 40 persons, and soil, pathology, entomology and horticulture laboratories.

Housing is provided for most of the senior research officers in close proximity to the Research Station.

5. Financial resources

The RD receives its funding from MOA and from donor organisations. (See Table 13.) The 1984/85 budget is M 2993598: of this amount, 18 percent is provided by the GOL, 80 percent by USAID, and two percent by FAO. Approximately 60 percent will be used in 1984/85 for recurrent costs and 40 percent for capital expenditures.

6. Summary evaluation

a. General

The research programme is addressing many of the current problems confronting agricultural productivity in Lesotho. The methodology being used is a systems approach of on-farm trials and enterprise combinations. These on-farm trials are backstopped by well-planned and well-executed research work on the Maseru Station and on selected research field stations.

The RD has well-planned projects which are directed at high-priority problems. The farming systems approach is well-suited to the conditions in Lesotho. The integration of rural sociology research and an extension research unit with agricultural research should pay great dividends.

At present the RD is heavily staffed with expatriates, but there are in effect good short-term and long-term training programmes which should result in an excellent cadre of national researchers in the future.

b. Crops

The major thrust in crop production is varietal testing and introduction to farmers of innovations that explicitly consider biological, technical and human factors. Practical problems, such as time and method of planting, row spacing, plant density, fertiliser rates and time of application, weed control, intercropping and seedbed preparation, are being investigated. Solutions to these problems will be of immeasurable benefit to the farmers. There is no plant breeding underway at this time, an omission which is probably a wise one.

c. Livestock

The work with livestock is limited to applied animal nutrition research. The primary focus is to determine what improvements in livestock production are feasible for the average village farmers in light of the resources presently available to them.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 13: Donor-Funded Agricultural Research Activities, 1984

Donor	Activity	Expected Results	Duration	Expatriate Technical Support (FTE)	Country Contribution (US$)	Donor Contribution	
						Recurrent (US$)	Capital (US$)
USAID	Farming systems research, on-farm adaptive research	Raise the standard of living in the rural areas	6 years	9	373,769	910,126	865,767
FAO	Rural structures construction	Farmers grain storage losses will subside	4 years	1	29,600	36,000	
TOTAL				10	403,369	946,126	865,767

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

This has led to projects such as: the winter feeding of hominy chop (a byproduct of the maize industry) to cattle; grazing of sheep and goats at reduced stocking rates; and studying the effects of flushing ewes at breeding time on lambing and weaning rates.

These projects are addressing important problems which have high potential payoffs. Progress with the feeding of oxen would alleviate the problem of oxen being too weak when spring ploughing should be started.

d. Range

The range research projects are addressing top-priority concerns such as: proper stocking rates, range burning, short duration rotational grazing systems, brush control and perennial forage introduction trials.

e. Linkages

The RD is very sensitive to the need and importance of disseminating research information to extension agents and producers. To this end the Division established an Extension Unit which has the responsibility to translate technical research findings and activities into language or other dissemination approaches that are compatible with village farmers' literacy levels and cultural backgrounds.

This Unit also has the mandate to relate with the Extension Service of the MOA, with farmers and other agricultural organisations. Some of the activities carried out by this RD Extension Unit include:

- o In-service training courses for District Extension officials and Extension Agents;
- o Training courses for village Chiefs, committee members, and farmers;
- o The production of circulars, bulletins and reports;
- o The recording and broadcasting of radio programmes for farmers; and
- o The organisation of field days at the RD's experimental farm and field stations.

The Director is also required to visit one of the ten Districts for at least three days each month. Collectively, the occasional service activities of the Director and Extension Unit of the RD bring together senior MOA officials, donor project personnel, farmers, Extension Agents and LAC students. This interaction will lead to a better understanding of agricultural research and extension and will encourage farmers to more readily accept recommendations from the RD.

The RD makes its library available to the students from LAC. In addition, the research staff occasionally teach courses and serve as guest lecturers and external examiners for LAC.

The Division has developed good cooperation and collaboration with several countries such as the member nations of the Southern Africa Development Coordination Conference and the seven nations which comprise the Cooperation for Development in Africa. The RD also works closely with the following international agricultural institutions: ICRISAT, IITA, CIMMYT and CIP.

f. Recommendations

(1) Where possible, Basotho working on advanced degrees should conduct their theses or dissertation research in Lesotho on a RD priority project.

(2) The linkages with LAC should be strengthened. Qualified LAC staff should be utilised to the fullest extent possible in conducting agricultural research. Research staff should continue to be encouraged to lecture at LAC. Another avenue through which this linkage could be strengthened is joint appointments.

(3) The programme of manpower development should be continued. Returning graduates should be required to conduct a minimum of three years of "hands-on" research before transferring to other positions.

(4) Resources should be concentrated at the Main Station and at the three prototype areas, until additional personnel and funds are made available to effectively use the field stations. Even then, only those stations of adequate size and which represent a unique ecological zone should be activated.

(5) The integrated, multidisciplinary team approach to research should be continued and strengthened, with emphasis on applied research directed to benefit small farmers.

(6) A computerised data base of agricultural research information should be established. This could be established as a service of the RD's library. It should include details on all research projects, objectives, procedures, results, recommendations, and costs.

(7) The RD's research agenda is extremely diverse in scope. Although problems being researched are of the highest priority, care should be taken not to extend the resources, manpower and finances beyond the effective limits. A "critical mass" of personnel and resources should be assembled and directed at specific, limited problems to achieve the greatest impact in the shortest time.

IV. AGRICULTURAL TRAINING INSTITUTIONS

A. Overview of Agricultural Training in Lesotho

Agricultural training at the college level is provided by a single institution: the Lesotho Agricultural College. In addition, the Thaba Khupa Ecumenical Center provides practical training for farmers. The National University of Lesotho's (NUL) curricula in Arts and Science and its Institute of Extra-Mural studies provide indirect educational support for the agricultural industry. These two institutions, NUL and the Thaba Khupa Ecumenical Center, will be discussed briefly because of their present and potential impact on Lesotho's agricultural development.

B. Lesotho Agricultural College

1. Organisational structure and purpose

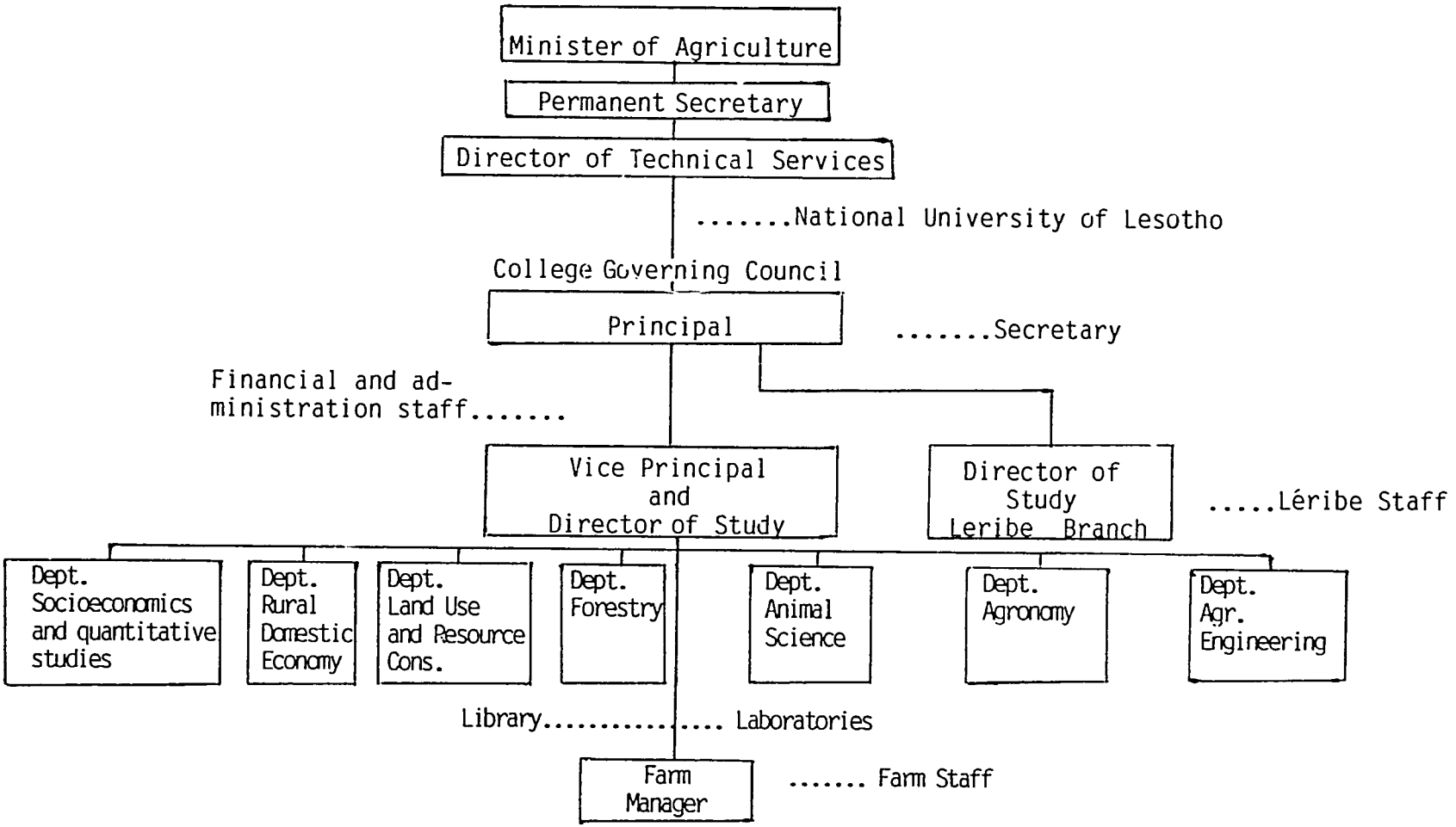
The Lesotho Agricultural College (LAC) is a division of the Lesotho Ministry of Agriculture and an affiliated college of the National University of Lesotho. (See Figure 7.) It was inaugurated in 1955 with the mission of providing a two-year certificate programme in Agriculture.

The second milestone in the LAC's history came as a result of the Government of Lesotho's Second Five-Year National Development Plan. A component of the Plan was to upgrade and expand Lesotho's only institution for the training of staff for the Extension Service of the Ministry of Agriculture. As a result, a diplomate-level course in Agriculture was introduced in 1977.

In 1979 a cursory affiliation with the National University of Lesotho was established. However, the College continues to be funded and administered by the Ministry of Agriculture, through a Principal who serves as the chief administrative officer.

In order to provide an additional number of extension assistants for the Basic Agricultural Services Programme, the Farmer Training Centre at Leribe was upgraded into a branch campus of the Lesotho Agricultural College. This Campus was designed for the certificate level with a total capacity of thirty students. The first students graduated from the Leribe campus in August of 1980.

The Lesotho Agricultural College and the Research Division of the Ministry of Agriculture are ideally situated for extensive collaboration. They are located next to each other and there is no demarcation between the research plots and the College farm. This opportunity has yet to be fully exploited. Although there is no formal linkage between the two institutions, there exist beneficial relationships. For example, the students from the Lesotho Agricultural College have free access to the research library of the



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 7: Organisation Chart of Lesotho Agricultural College

Source: Lesotho Agriculture College, 1984.

RD and make good use of it. Staff members from the Research Division on occasion serve as guest lecturers and external examiners for LAC. However, the staff members of LAC are not trained to conduct research and currently are not involved in it.

The LAC's linkage with the Extension Programme is through the participation of the students in practical field training. Each diploma student is attached to an extension agent for a training period, at the end of which the student presents a project report. It should be noted that until 1980, all graduates from the College obtained jobs with the MOA, with the overwhelming majority joining the Extension Service. Occasionally the staff of LAC become involved with programmes at the Farmers Training Centre, or produce publications which can be used by the Extension Service. Examples of such publications are Handbook on Soils of Lesotho and the Handbook on Veterinary Helminthology.

2. Training programmes

a. Diploma in Agriculture

The two-year diploma programme was established in 1977. Each successful applicant must participate in a four-month, pre-instructional course which is designed to enhance the students' skills in basic mathematics, chemistry, ecology, biology, metal work, technical drawing, tractor driving and elements of carpentry.

The curriculum emphasises six subject matter areas: agricultural economics, extension methods, agronomy, animal production, land use and resources conservation, and agricultural engineering.

From 1979 to 1983, the College awarded a total of 93 diplomas and achieved an attrition rate of less than 13 percent. The current enrollment figures are given in Table 14. Students are expected to have passed, as a minimum, english, mathematics and science in the London GCE "O"-level examinations, or a minimum of a third division pass in the Cambridge Overseas School Certificate, in order to qualify for admission to the diploma programme. All of the students come from rural backgrounds and from the traditional agriculture sector. Each year, a proportion of the places offered are reserved for persons already serving with the Ministry of Agriculture as part of the policy of upgrading the skills of present employees.

b. Certificate in Agriculture

The agriculture certificate programme was the first to be established, and had its first graduates in 1957. It is a two-year course of study in general agriculture. Approximately 50 percent of the time is devoted to acquiring the practical skills necessary for the husbandry of livestock and the production of crops.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 14: Agricultural Training Institutions: Degrees Offered, Number of Staff and Students, 1984

Institution	Degrees, Diplomas, or Certificates Offered	Number of Staff[a]	Enrollment		
			F	M	Total
Lesotho Agricultural College[b]	Certificate in Agriculture	25	28	32	60
	Certificate in Rural Domestic Economy		35	-	35
	Certificate in Mechanization		-	22	22
	Certificate in Forestry		1	17	18
	Diploma in Agriculture		9	25	34
TOTAL		25	73	96	169

[a] Common teaching staff for all programmes at both levels.

[b] Campuses at Maseru and Leribe.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

Over the 26 years from 1957 to 1983, 658 students graduated from the programme, the majority of whom found ready employment in the Extension Service of the Ministry of Agriculture or with the multi-donor Basic Agricultural Services Programme. In 1981, due to economic necessity, the GOL placed a freeze on employment which had a direct impact on the number of admissions to the Certificate in Agriculture programme. The number of admissions fell by 60.4 percent in two years: from 53 in 1980 to 21 in 1982.

The College has gradually raised the admissions requirement from the equivalent of three years of secondary education to five years of secondary education. The administration uses its discretionary powers in the admission of students to all the certificate programmes.

c. Certificate in Forestry

The forestry certificate is a one-year programme in general forestry. The emphasis is on practical skills which represent approximately 60 percent of the curricular focus.

Subjects covered generally include: silviculture, forest economics and land use policy, watershed management and forest technology. The students are being prepared to meet the needs of the Woodlot Project and the projected need of the Ministry of Agriculture in the area of forestry.

The programme was initiated in 1981 with the admission of nine students. To qualify for admission, each applicant must have a certificate in Agriculture with a minimum of a second division pass. In addition, two years of field experience are required.

d. Certificate in Agricultural Mechanisation

In 1979 a two-year certificate programme in agricultural mechanisation was instituted. The objective was to provide skilled people for the maintenance and repair of farm machinery. Because of the practical nature of this programme, enrollment have been limited in order to ensure personalised attention. The fifth term of this six-term programme is spent in field experience where students gain an appreciation of work environments.

A minimum of the General Certificate of Education with passes in mathematics, English and physics or physical science is required for admission. In the past three years, the programme has graduated 42 students.

e. Certificate in Rural Domestic Economy

This is a two-year programme covering the traditional, applied areas of home economics. The graduates are employed by the Nutrition Section of the Ministry of Agriculture as extension

assistants. Some enter the teaching profession; others find employment with the Ministry of Rural Development. From the first graduating class of 1964 to that of 1983, the programme certified 286 females. Table 14 presents the current enrollment for each programme.

3. Human resources

The Lesotho Agricultural College is headed by a Principal who is assisted by a Vice Principal, who also is Director of Study for the Maseru Campus. There also is a Director of Study for the Leribe branch. There are five authorised administrative positions, eighteen professional positions, twelve technical positions and fifty support staff positions. (See Table 15.)

All of the administrative posts are filled with nationals; ten of the professional posts are filled with nationals, five by expatriates. There are currently four professional positions vacant.

Table 16 shows the levels of qualification and disciplines for the teaching staff. The disciplines represented on the staff are: crop science, horticulture, range ecology, soils, animal science, agricultural economics, extension education and home economics. Of the professional staff, four are females and 13 are males.

Currently, there are seven people in training, including the Principal: three are working on Master's degrees, one on a Bachelor's degree and three on diplomas. They are all being trained outside of Africa. (See Table 17.)

4. Training facilities

The main campus of the College in Maseru is small but attractive. All courses are fully residential, and the buildings are conveniently grouped together.

Three new resident halls were constructed in 1977 with the capacity to accomodate 200 residents. These are in excellent condition.

The College has eight classrooms with a total capacity of 432 m^2, and is capable of accommodating 200 students. There are three conference and meeting rooms designed for 300 people (243 m^2), two teaching laboratories with a combined size of 324 m^2, and 20 administrative and staff offices, each designed to accomodate two persons. The combined floor space of these offices is 259 m^2. All of these facilities are in good condition.

The livestock buildings are in good condition, and include a dairy cattle milk parlour, shearing shed, housing for layers and broilers, and farrowing pens.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 15: Total Agricultural Training Staff, 1984

	Administrative	Professional[a]	Technical[b]	Total
Total Authorized Posts	5	18	12	35
Positions Vacant	-	4	-	4
Nationals (Citizens)				
Staff in training	1	4	3	8
Staff on long-term leave[c]	-	-	-	-
Number of nationals currently in authorized posts	4	10	9	23
Expressed as a percent of authorized posts	80	56	75	66
Expatriates				
Serving in authorized posts[d]	-	4	1	5
Not in authorized posts	-	1	-	1
Total number of expatriates	-	5	1	6
Expressed as a percent of authorized posts	-	28	8	17
Total Number of Staff	4	15	10	29

[a] Professional = BSc or above.

[b] Technical = diplomate and certificate.

[c] Long-term leave is leave of three months or more.

[d] Irrespective of source of funds.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 16: Disciplines of Teaching Professionals, 1984

Discipline Area	Nationals								Expatriates								Total
	BSc		MSc		PhD		Subtotal		BSc		MSc		PhD		Subtotal		
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	
Crop science, general	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–	–	2
Horticulture	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Range ecology	–	1	–	–	–	–	–	1	–	–	–	1	–	–	–	1	2
Soils/Conservation	–	1	–	–	–	–	–	1	–	–	–	–	–	1	–	1	2
Animal science, general	–	1	–	1	–	–	–	2	–	–	–	1	–	–	–	1	3
Agr. economics	–	1	–	–	–	–	–	1	–	–	–	–	–	1	–	1	2
Extension specialists	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–	–	2
Home economics, general	3	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	3
TOTAL	4	8	–	1	–	–	4	9	–	–	–	2	–	2	–	4	17

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 17: Training Plans for Staff of the Lesotho Agricultural College, 1984

Level	Number in Training			Location of Training		
	Male	Female	Total	In Country	In Africa	Outside Africa
Current Situation						
Masters[a]	2	1	3			3
Bachelors[b]	1		1			1
Diploma[c]	3		3			3
Subtotal, Current Situation	6	1	7			7
Future Plans for Training						
Masters			2			2
Bachelors			3			3
Diploma			3			3
Subtotal, Future Plans			8			8

[a]One each in soil conservation, personnel management and forestry.

[b]One in soil conservation.

[c]All in general agriculture.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

There is one polyethylene-covered greenhouse with a floor space of approximately 30 m^2 which is in poor condition.

The service facilities include three machinery workshops with a collective floor space of 360 m^2: these are in good condition. The one maintenance workshop of 120 m^2 is in poor condition.

The College is adequately supplied with audio-visual equipment, having four overhead projectors, two slide projectors and one movie projector.

The library has approximately 500 volumes, as well as 20 periodicals and scientific journals. Its acquisition averages 20 volumes per year.

Students have access to the library Monday through Friday. As a reference library, technical books are not released on loan. The students also have access to the Research Division library adjacent to the College.

The College farm is comprised of 112 ha: 58 ha are permanent grassland: 52 ha are cultivated, of which 16 ha are under irrigation: and two ha are devoted to fisheries studies under the direction of the MOA Livestock Division. The primary objective of the farm is to meet the practical teaching needs of all courses offered at the College, including farmer training courses.

One of the advantages of the farm is that it includes soils representative of most of the farming areas in Lesotho. The soils along the Caledon River are deep, generally well-drained, alluvial soils suited to the growing of irrigated cash crops, fodder and vegetables. The red soils of the western section of the farm are deep, freely-draining sandy loams which are well suited to arable crop production. The remainder of the farm consists of sandy grey soils overlying heavy clay, and are suitable for permanent grassland or crop production under good management.

5. Financial resources

The Lesotho Agricultural College receives its operating budget from the GOL through the Ministry of Agriculture. The operating budget for 1983/84 was M 742,190 or US$ 549,220.

6. Summary evaluation

Agricultural production in terms of yield per ha in Lesotho has been gradually declining since 1950, in spite of considerable efforts to improve agricultural techniques and cultural practices. In Lesotho, farmers not only have limited education, but they also have limited exposure to adequately-trained technicians. Many studies conducted in recent years in developing countries have shown that farmers' levels of education and their exposure to well-trained

extension personnel constitute two of the major factors for achieving increases in production and income.

These conditions provide an excellent opportunity for the Lesotho Agricultural College to make a major contribution to agricultural productivity by providing training.

Therefore, over the next ten years, it would be desirable to:

- o Strengthen the linkage between the Lesotho Agricultural College and the National Extension Programmes. The Lesotho Agricultural College should develop short courses to meet the specific in-service training needs of the Extension staff;
- o Create a centre for agricultural information at the Lesotho Agricultural College. The centre would interpret research data and present it in a format easily understood by farmers;
- o Reinforce the Lesotho Agricultural College's curriculum to provide high-quality, practical and production-oriented formal education;
- o Strengthen the Lesotho Agricultural College's library and increase student access to it;
- o Increase staff salaries and fringe benefits in order to retain a highly-competent national staff;
- o Increase training opportunities for all staff. This would increase the level of competence and commitment of staff; and
- o Enhance the linkage between the Lesotho Agricultural College and the MOA's Research Division. Joint appointments of staff would strengthen both programmes. A first step could be a formal Memorandum of Understanding outlining specific areas of cooperation.

C. Thaba Khupa Ecumenical Centre Farm Institute

1. Organisational structure and purpose

The Thaba Khupa Ecumenical Centre Farm Institute was established in 1972 as a response to the increasing number of unemployed and the need to increase food production. The Centre's underlying philosophy is that if young men and women are taught basic agricultural skills and a practical knowledge of farming, they will not only be self-employed but will assist in increasing the country's food production as well.

The Thaba Khupa Ecumenical Centre is a private farm institute which receives support from numerous private organisations within Lesotho and from overseas agencies. Its major affiliation is with the World Council of Churches. Agencies from such countries as England, Holland, Australia, US, Belgium, Germany, Denmark and Malawi have contributed to its development. Various Ministries of the Government of Lesotho also provide technical assistance to the centre.

The specific objective of the Thaba Khupa Ecumenical Centre is to provide practical training in agriculture and to encourage the students to become self-employed commercial farmers.

2. Training programme

The entrance requirements, designed to select students who will achieve the objective of the institution, include being 17 years of age or above, and having a primary school education. Most importantly, students must have written declarations from their parents or guardians together with the Chief and his land allocation and development committee, allowing each student to occupy at least one ha of land under his control, before or at completion of the proposed course.

The training starts with a probationary course of six to eight weeks. At the end of this course students are interviewed and the successful ones are permitted to enter the eighteen-month residential course. The institution has a total capacity of 35 students.

During each student's first year a visit is made by members of the staff to see the student's home area, meet his or her parents and local Chief. At this time a survey is made of the available land, marketing possibilities, supplies of materials and the availability of water. The information gained is used to make the curriculum more relevant to the students' actual needs.

A second visit is made in the latter part of the programme at which time a specific plan is made for the students' own farms. After the completion of the course, students are visited at regular intervals by the Farm Institute's extension staff for a period of two years.

The curriculum includes practical training in the production of fruits and vegetables, cereal crops, poultry, and animal husbandry. Instruction is also given in oxen equipment, conservation, home economics and rural crafts, English and applied mathematics, religious studies, health science, and basic farm management.

At the end of the course each student receives a certificate of participation. This certificate is not recognised by the Government of Lesotho.

In addition to the eighteen-month course for residential students, the Institute conducts short courses for adults and young farmers. The topics covered are similar to those in the residential programme.

3. Training facilities

The campus is situated on a 60 ha site. Its facilities include three student resident halls, a large area of established trees, three polyethylene greenhouses with a capacity of 400 m^2, and poultry houses with a combined capacity of 2800 broilers and 100 laying hens. The horticulture unit has four ha of arable land, and the farm production unit has nine ha. Fisheries are comprised of five ponds with an area of 1.3 ha stocked with carp.

The remaining facilities include: a metal workshop, an administrative building with a library and six staff offices, a lecture room block and student housing.

4. Financial resources

The land for this institution was granted by the Principal Chief of Thaba-Bosiu to the Lesotho Sodepax Commission. Financial support comes from the World Council of Churches and from numerous local and international organisations.

The students are charged a fee of M 390 for the 18 months which represents approximately 25 percent of the cost of their training.

5. Summary evaluation

A description of the Thaba Khupa Ecumenical Centre is included in this report because it is a unique national resource. It does not pretend to provide sophisticated theoretical concepts and philosophy on agricultural development, but instead teaches the practical skills needed for one to be a successful farmer in Lesotho.

The institution promotes self-reliance, self-esteem and self-confidence. It instills in its students the love of the land and a desire to work, and the students are taught the skills necessary to make a good living from farming. It develops and implements policies and procedures which ensure that the students have the resources to become farmers, such as land and money for seed. It also provides continuing technical advice after graduation. In a small way it is successfully addressing two important national concerns: the growing numbers of unemployed and the need to increase local food production.

For the school to continue this important service of training farmers, it must be given the necessary resources. It would be desirable over the next ten years to:

- o Expand the capacity of the Institution to accomodate 70 students, while continuing the emphasis on training farmers in the practical skills of food production:

- o Develop linkages with Lesotho Agricultural College, the Research Division, the Extension Division and other divisions of the MOA:

- o Develop a work experience programme for students with successful graduates: and

- o Obtain a subsidy from the Government of Lesotho in order to strengthen the programme and keep fees at a minimum, within the financial resources of the clientele.

D. National University of Lesotho

The National University of Lesotho was established in 1945 as Pius XII College. In 1964 it became a campus of the newly-established University of the Basutholand, Bechuanaland and Swaziland Protectorates. In 1966 the emergence of independence for the three nations brought with it a change in the institution's name to the University of Botswana, Lesotho and Swaziland. In 1975 the University's Roma Campus was nationalised to form the National University of Lesotho (NUL).

NUL provides for Lesotho's higher education needs in humanities, pure science, education, law, economics, and social science. It does not currently offer courses in agriculture. However, its Second Five-Year Development Plan, dated February 16th, 1981, states that plans are underway to constitute a Faculty of Agriculture which will offer courses up to the Bachelor's degree level. The plan states that the implementing body will be the NUL through the Faculty of Science and the LAC.

The Institute of Extra-Mural Studies (IEMS) was founded in 1960 and is an integral part of the NUL. It is a nonformal educational service which provides adult development education to students throughout Lesotho. Increasingly it is patterning its services on the land grant extension model.

The IEMS is organised into the following sections: Community and Leadership Development, Practical Businessmen's Training, Certificate/Diploma Level Business Studies, Labour Studies, Part-time University Degree Instruction, Research and Evaluation, Media, and Credit Union Education.

The general goal of IEMS is to extend university services to the adult population of Lesotho, for the promotion of socioeconomic development and for improving community life. One specific goal is to increase the pool of trained personnel for managerial positions in the upper and middle levels of the public and private sectors. Although

the IEMS programmes are not specifically directed to the agricultural sector, the increase in trained personnel will have a positive impact on agricultural development.

V. AGRICULTURAL EXTENSION INSTITUTIONS

A. Overview of Agricultural Extension in Lesotho

In the Kingdom of Lesotho, agricultural extension services are provided entirely by the government. There are no private or parastatal organisations providing these services.

B. National Agricultural Extension Service

1. Organisational structure and purpose

The Lesotho National Agricultural Extension Service is one of two major divisions in the Ministry of Agriculture. The organisational chart of the MOA was given in Figure 7.

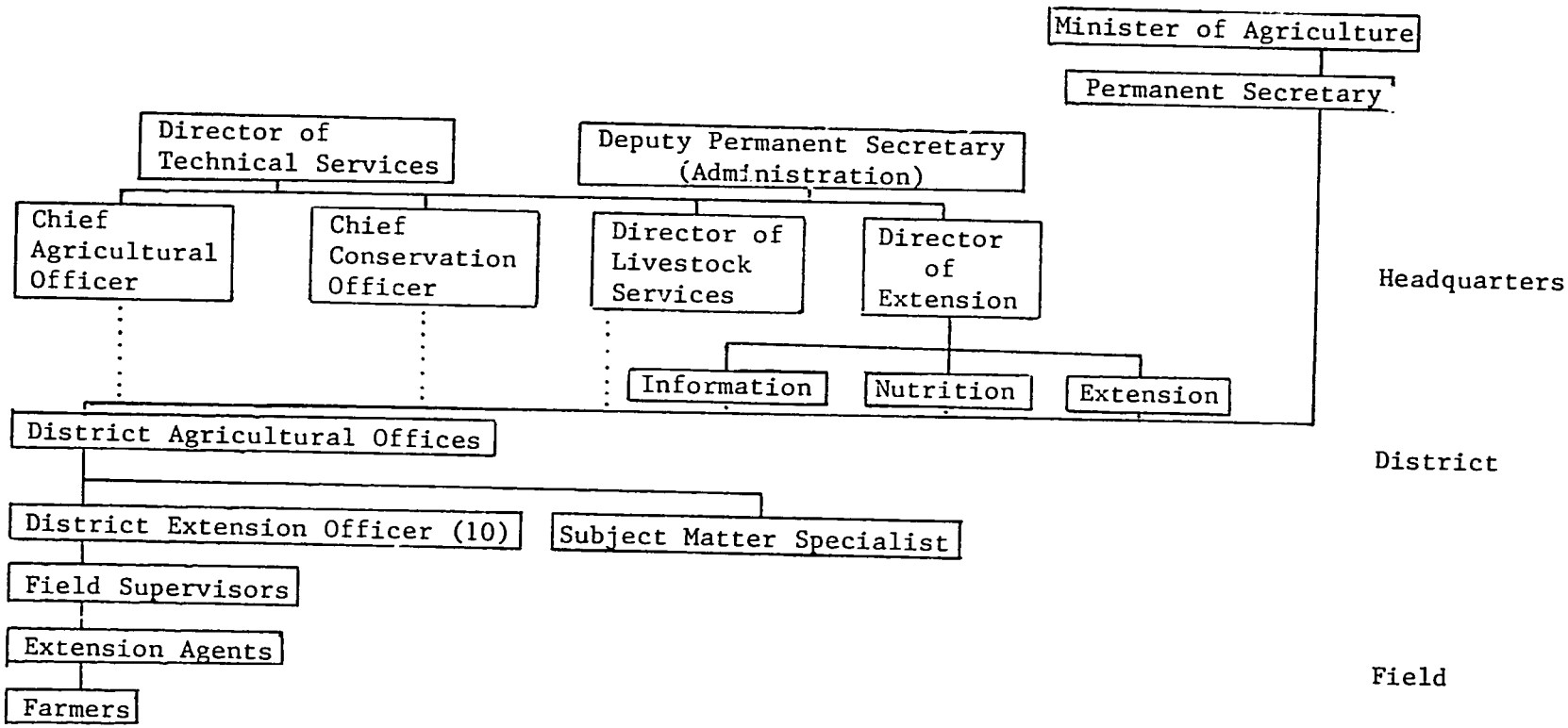
The Extension Service has four major units: Agricultural Information, Nutrition and Home Economics, Youth, and Farmer Training Centres. These units are housed in Maseru and provide support to the Field Extension Service. The Field Service is organised into ten District Administrative Units which, in turn, provide services at the village level. The organisational chart for the Extension Service at the district level is given in Figure 8.

The Extension Division is closely linked with the technical sections of the MOA. In reality, the technical officers from the livestock, crops, and soil conservation divisions serve as Subject Matter Specialists (SMSs) for the extension field staff.

Currently, the basic input from the technical sections occurs at the district level. This involves the planning, organising and implementation of extension education activities with both extension personnel and the respective officers of the sections at the district level. Training the Extension Agents (EAs) and backstopping them in the field are two of the major responsibilities of the SMSs from the Technical Divisions. The fact that the extension plan of work at both the EA and SMS level reflects jointly-planned activities establishes the formal relationship between the two units.

The Research Division's (RD) Farming Systems Research Project has excellent collaboration with the extension field staff in its three prototype areas in Siloe, Nykasoba and Mokhotlong.

The RD also has an Extension Research Unit with strong training and publication functions. The results of research are published through fact sheets, circulars and technical reports, and are distributed to every extension worker in the country.



LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Figure 8: Organisation Chart of the National Extension Service

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

There are many examples of cooperation between the RD and the extension field staff; however, most of these are planned and conducted on an informal basis, with much of the initiative coming from the RD.

The responses to the question about the relationship with research given by the staff of the National Extension Units of MOA varied from good to none. For example, the Young Farmers supervisor reported that his unit receives publications and instructions on new technologies from the RD. In turn, they submit research proposals prioritised according to the farmers' needs. The Nutrition Unit reported no relationship with research, but indicated the desire to build linkages. The Agricultural Information Office reported that they use information from research in their daily radio broadcasts and also in leaflets which are distributed to farmers and extension workers. It should be noted that the linkages are informal and seem to depend on personalities.

The Extension Division has strong links with the producers. The EAs live in the villages and are part of the communities. The main problem in this relationship is that in many cases the EAs have no means of transportation and, therefore, cannot make frequent and regular contact with the outlying producers.

The linkage between LAC and the Division of Extension are, at best, informal. The strongest link is at the Leribe Campus of LAC, where the District Agricultural Officer (DAO) represents the MOA and has direct administrative input into the operation of the Leribe Campus in collaboration with the Principal. This campus initially was exclusively a Farmer Training Centre and continues to provide those services along with the College programme.

2. Extension programmes

a. Extension field work

The work of the Extension Service is carried out at the field level with farm families. The EAs work as generalists, diffusing important agricultural information to farmers. Extension programming is based on both national development objectives and farmers' needs. For example, the objectives of the National Five-Year Development Plan are used as a framework for developing the Extension Plan of Work. In addition, the EAs work with farmers and village groups in determining their needs.

Activities have included farmer training sessions, field trials, field days, establishment of demonstrations, and in-service training provided by the SMSs. Much of the extension effort is on production methods of the major crops and livestock species. The EAs also provide assistance in procurring farm inputs and marketing of outputs.

b. Agricultural Information Office

This unit is the information arm of the Extension Service. The major goals of this office are to:

- o Promote the objectives and policies of the MOA; and
- o Provide information backstopping and support to extension personnel at all levels.

The Office's activities include: the production of agricultural information leaflets, bulletins, posters, and photographic materials; farm broadcasts: arrangements for displays during agricultural shows; and organisation of field campaigns and field visits.

c. Farmer training centres

The six farmer training centres are used to provide:

- o Residential, short-term training for farmers;
- o Accommodations and facilities for in-service training for agricultural field staff; and
- o Opportunities for young farmers to receive agricultural training.

Some of the groups served by these centres include: Cooperative members, poultry producers, farm machinery groups, wool associations, and young farmers. In addition, the facilities are also used for the training of groups not directly related to farming, such as the Red Cross.

3. Human resources

a. National level

The National Extension Service is administered by a Director who reports to the Permanent Secretary of the MOA through the Deputy Permanent Secretary. (See Figure 8.) The Director of Extension is assisted by the Chief Extension Officer and the Senior Extension Officer. These officers supervise district extension personnel, plan in-service training programmes, and manage the Farmer Training Centres. In addition, there is a Chief Nutrition Officer, a Senior Nutrition Officer and a Nutrition Officer in the Nutrition and Home Economics Unit. In the Youth section there is a Young Farmers Club Organiser. The Agricultural Information Unit has 56 authorised posts and is administered by an Agricultural Information Officer. A number of positions at the National and District level have not been filled during the past three years. In addition, the following senior positions are currently vacant: Director of Extension, Senior Extension Officer and several District Extension Officer posts.

At the national level, the administrative heads of the Agricultural Information Office, Nutrition and Home Economics, and Young Farmers Club units report directly to the Chief Extension Officer. The basic qualification for posts at the national level is education to the certificate level.

b. Field staff

Each of the ten districts is headed by a District Agricultural Officer (DAO). Under the DAO, the chief administrative officer for extension at the district level is the District Extension Officer (DEO). The DEO is directly responsible for the supervision of Area Extension Supervisors and Extension Assistants. The latter are the village-level workers.

The DAO is the overall administrative head of the various field units of the Technical Division. The units include Livestock, Crops, Soil Conservation, Range and Special Projects. A cadre of Subject matter Specialists (SMSs) are drawn from the staff of these technical units, who provide technical backstopping and training for the EAs.

Tables 18 and 19 give a summary of the extension personnel, including the staff from the Technical Divisions of Soil Conservation. Livestock, and Crops. There are currently 972 people doing extension work. This total includes 39 administrators, 49 professionals (BS and above) and 884 technical (diploma/certificate). Of these numbers, expatriates hold two of the administrative positions, 18 of the professional posts and one of the technical positions. There are 207 positions vacant which represent 16.6 percent of the total authorised posts.

Table 20 shows that 20.1 percent of the total staff effort is devoted to food crops, 22.5 percent to livestock, 3.5 percent to information, 38.9 percent to general extension and youth, 8.3 percent to soil and water conservation, and 6.7 percent to nutrition and home economics.

The training plans are summarised in Table 21. There currently are two people being trained at the Master's level and 15 at the Bachelor's. The future plans include training five people at the Master's level, 18 at the Bachelor's, and nine at the diploma and certificate level.

4. Extension facilities

The National Extension Service staff at headquarters in Maseru are adequately housed in a building shared with the soil conservation division.

Each district has an office building which houses the DAO, DEO and the SMSs. There are no office facilities at the village level.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 18: Agricultural Extension Institutions: Programmes and Staff, 1984

Institution	Major Programmes	Authorized Posts	Professional[a]				Technical				Total
			Nationals		Expatriates		Diplomate		Certificate		
			F	M	F	M	F	M	F	M	
Ministry of Agriculture, National Agricultural Extension Service	Agric. information	56	-	-	-	-	-	4	8	20	32
	Nutrition	98	2	-	-	1	2	-	58	-	63
	Extension (Youth, FTC, field staff)	426	-	-	-	3	20	49	100	195	367
	Livestock	274	4	6	-	3[b]	13	16	66	92	200
	Soil conservation	108	2	7	-	5	7	15	15	30	81
	Crops	282	1	9	-	6	13	22	47	92	190
TOTAL		1,244	9	22	-	18	55	106	294	429	933

[a] Academic degree holders; administrative staff is not included.

[b] Serving in authorized posts.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resources Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 19: Total Agricultural Extension Staff, 1984

	Administrative	Professional[a]	Technical[b]	Total
Total Authorized Posts	45	75	1124	1244
Positions Vacant	8	28	207	243
Nationals (Citizens)				
Staff in training	-	16	34	50
Staff on long-term leave[c]	-	-	-	-
Number of nationals currently in authorized posts	37	31	883	951
Expressed as a percent of authorized posts	82	41	79	76
Expatriates				
Serving in authorized posts[d]	-	3	1	4
Expressed as a percent of authorized posts	-	4.0	.1	4
Not in authorized posts	2	15	-	17
Total number of expatriates	2	18	1	21
Total Number of Staff	39	49	884	972

[a] Professional = BSc or above.

[b] Technical = diplomate and certificate.

[c] Long-term leave is leave of three months or more.

[d] Irrespective of source of funds.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 20: Summary of Extension Staff Effort and Source of Funds Related to Programme Areas, '984

Programme	Funding Source	FTE[a]	Percentage of Total Staff Time
Commodity-Related			
Food crops	GOL	195	20.1
Livestock	GOL	219	22.5
Information	GOL	34	3.5
Extension (Field staff, youth and FTC)	GOL	378	38.9
Soil & water conservation	GOL	81	8.3
Other Programmes			
Nutrition and home economics	GOL	65	6.7
TOTAL		972	100.0

[a] FTE = Full Time Equivalent.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

LESOTHO: AGRICULTURAL RESEARCH RESOURCE ASSESSMENT

Table 21: Training Plans for Staff of Extension Institutions, 1984

Level	Crop Science		Animal Science		Veterinary		Home Economics		Soil Consv.		Total	
	F	M	F	M	F	M	F	M	F	M	F	M
Current Situation												
Doctorate	-	-	-	-	-	-	-	-	-	-	-	-
Masters	-	1[a]	-	-	-	-	-	-	-	1[b]	-	2
Bachelors	1	9	1	-	-	2	1	-	-	1	3	15
Diploma	-	-	-	-	-	-	-	-	-	-	-	-
Future Plans for Training												
Doctorate	-	-	-	-	-	-	-	-	-	-	-	-
Masters	2	3	-	-	-	-	-	-	-	-	2	3
Bachelors	7	13	2	2	-	-	-	-	2	3	11	18
Diploma	5	5	-	-	-	-	-	-	3	4	8	9

[a] Agronomy.

[b] Soils.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

The GOL provides a limited number of dwellings for extension field staff at a nominal rental fee.

5. Financial resources

The National Extension Service receives its budget from the GOL through the MOA. The Minister of Agriculture presents the needs of the MOA to the parliament at each session. Once the budget is approved, the MOA allocates a budget to extension.

Over the past three years, the GOL has encountered difficult economic times. This has resulted in the implementation of austere fiscal measures. The Extension Division has been unable to fill many vacancies, and funds for operations have been severely limited. The total budget for 1984/1985 is M 684,980. This represents 5.9 percent of the MOA budget, as compared to 4.4 percent for the Research Division, 6.4 percent for the Agricultural College, 11.2 percent for the Livestock Division, 5.9 percent for the Crops Division, and 9.0 percent for the Soil Conservation Division.

6. Summary evaluation

The Extension Service can be the most effective vehicle to facilitate change and stimulate increased agricultural production. To achieve this, however, the Extension Service must have adequate resources and clear directives. It needs both financial and human resources coordinated by a simple organisation. Therefore, to improve the effectiveness of the Extension Service, it is recommended that:

- The agricultural extension functions of the MOA be brought together and placed under the leadership of a single administrator. One of the major problems resulting from the present three administrator systems is a lack of a single direct line of technical support and administrative control;
- Intensive in-service education programmes be developed for the FAs and conducted on a regular schedule;
- Training opportunities be provided for the SMSs. This would increase the competence of the SMSs who could then provide quality in-service training for the EAs;
- Sufficient financial resources be provided to maximise the effectiveness of the Extension Service's personnel, particularly to meet the needs for educational materials, equipment and transportation;
- The link between Extension and the Research Division be strengthened. Extension should regard the Research Division as its information base and agricultural problem-solver;

- The LAC be better integrated with Extension. LAC can contribute substantially to Extension by conducting in-service training programmes for Extension personnel;

- Appropriate incentives be provided to attract and retain good personnel, and to recognise superior performance within Extension: and

- A comprehensive personnel evaluation system be developed and used to effect staff development, promotions, and salary increases.

Extension should be decentralised to the extent that the villagers consider it a locally-based organisation which is responsive to the needs of local citizens. Though there should be continued GOL input in the determination of the programme priorities, the emphasis should be on the local control of organisational decisions.

Because greater autonomy allows in organisation more adaptability and flexibility in dealing with local problems, extension, in comparision with most other government divisions, should be highly decentralised in its decision-making. This decentralised decision-making structure should increase local participation and confidence in extension.

VI. CONSTRAINTS TO AND THE POTENTIAL FOR INCREASED PRODUCTIVITY

A. Major Food Crops

1. Current and potential yields

Crop production in Lesotho is traditionally-based with peasants farming approximately 1.4 ha each. Yields of the major crops have increased in recent years but are still extremely low. The average crop yields for 1980/81 were as follows: maize, 847 kg/ha: sorghum, 795 kg/ha: wheat, 852 kg/ha; and pulses, 579 kg/ha.

The RD consistently obtains much higher yields. For maize and sorghum it is not unusual to produce two to three MT per ha, for wheat 1.5 to 2.0 MT, and for pulses one to 1.5 MT. It is conceivable that over the next ten years the national average could approximate the current levels obtained by the RD.

The survey on constraints to increasing agricultural productivity of small farmers' crops or cropping systems in Lesotho dealt with five major crops: maize, sorghum, wheat, pulses, fruits and vegetables. See Table 22 for the ranking of importance of the constraints by the respondents. The constraints are common to all crops with small variations in degrees of impact, and for this reason the results of the survey will be presented jointly.

2. Physical and biological constraints

a. Climate

The majority of the respondents considered climatic factors to be a serious constraint. Lesotho has a temperate climate with well-marked seasons. It lies in a semi-arid region of Southern Africa and receives 85 percent of its annual rainfall from October to April. As a result, the respondents were more concerned about the distribution of rainfall than the amount. Rain often comes in a sudden torrential downpour. Lesotho is also subject to severe hailstorms, frost and long periods of drought which often destroy an entire crop.

b. Soils

The survey revealed that soil degradation is a major constraint to agricultural productivity. Soil erosion is one of the most significant agricultural problems in Lesotho. The soils are low in organic matter and fertility; animal waste and crop residues are not returned to the soil. Overgrazing and intensive monocropping also add to the depletion of the soil.

Table 22: Perceptions of Severity of Constraints to Achieving Higher Crop Yields[a]

Constraints	Maize	Sorghum	Pulses	Fruits/ Vegetables	Wheat	Average
Physical/Biological						
Climate	3.8	4.1	4.0	4.2	3.1	3.9
Annual rainfall	3.4	3.5	3.7	4.1	3.4	3.7
Rain distribution	4.0	3.6	3.9	4.5	3.8	4.0
Soil suitability	3.4	3.0	3.0	3.6	3.6	3.4
Soil degradation	4.1	3.7	4.1	4.2	4.3	4.1
Soil topography	3.6	3.7	3.7	3.6	3.1	3.6
Weeds	4.1	4.4	4.5	4.1	3.3	4.1
Plant diseases	3.2	3.3	4.1	3.6	2.8	3.5
Pests/Insects	3.7	3.7	4.2	3.8	3.3	3.8
Predators	2.8	3.5	2.8	3.0	2.5	3.0
Varieties/Species	3.5	3.8	3.7	4.0	4.2	3.9
Human power	4.0	4.2	4.1	3.8	3.7	4.0
Animal power	3.7	4.3	4.4	3.6	3.2	3.9
Economic/Policy						
Prices	4.0	3.8	4.0	4.5	4.5	4.2
Marketing	4.1	4.1	4.2	4.2	4.6	4.3
Short-Term credit	3.9	3.3	3.7	4.0	3.6	3.8
Long-Term credit	3.7	3.2	3.3	3.8	3.2	3.5
Government subsidy	3.8	3.5	3.2	3.2	4.2	3.6
Import policies	2.7	2.7	2.3	2.5	3.0	2.7
Traditional						
Land tenure	3.9	3.5	3.5	4.1	4.5	4.0
Farm size	3.9	3.7	3.6	4.2	4.2	4.0
Education	4.0	3.8	3.8	4.5	4.0	4.1
Role of women	3.7	3.7	3.6	4.1	3.1	3.7
Institutional						
Research	4.0	4.8	4.5	4.0	4.4	4.4
Training	4.2	4.5	4.3	4.0	4.5	4.4
Extension	4.4	4.4	4.4	4.4	4.4	4.4
Overall Average	3.8	3.8	3.8	4.0	3.8	3.8

[a] Weighed average of respondent rankings: 1 = Not serious, 5 = Very serious. Number of respondents varied by crop from 5 to 10.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

c. Weeds

Weeds are considered to be a major constraint to achieving higher yields. Research data has shown that effective weed control in maize will result in a manifold increase in yield. Special attention should be given to the time of hoeing.

d. Pests, diseases and predators

Pests and diseases, although continuing problems, were not considered overwhelming constraints. The common pests and diseases are stork borers, cut worms, aphids, smut and seed borne diseases. There is a great deal of post-harvest loss due principally to inadequate storage facilities. Predators were not considered a serious constraint.

e. Varieties/species

The dearth of appropriate varieties and species was considered to be an important constraint to achieving higher yields. Farmers often save seed from one crop for the next, thus losing the advantage of hybrid vigour. The inaccessibility of most regions makes it difficult for farmers to receive inputs on a timely schedule, and adds to the cost.

f. Farm power

A lack of both manpower and draught power was considered to be a major constraint to achieving increased crop production.

The demographic effects of migrant labour and the ease of movement into South Africa have led to a situation in which women slightly outnumber men in the de jure population and greatly outnumber men in the de facto population. It is estimated that 60 percent of Lesotho's male work force are migrant workers, leaving women and children to provide most of the labour for agricultural production. To confound this problem, the men in absentia continue to make critical farming decisions such as time of planting, fertilising, and weeding.

The introduction of the iron plough and tractors means that men are now essential for initiating the planting season, but they are often working in the mines of South Africa at these critical times.

The shortage of male labour and the lack of training in the basic agricultural skills among the farmer population have lowered productivity and are obstacles to agricultural development.

Cattle are frequently used for draught power to plough the fields. However, the land often is not prepared in a timely manner because of the unavailability of draught animals. it is not unusual for oxen to come through the winter in a weakened condition because of poor nutrition.

To ameliorate this problem, the Government of Lesotho provides tractors for ploughing and other farm machinery services.

3. Economic constraints

a. Pricing

Pricing was considered to be a major constraint by the respondents. There has been considerable variation in prices from year to year, thus creating uncertainty in the farmers' minds. It is particularly important at planting time for farmers to have some reasonable assurance of the prices at which they will be able to sell their crops.

Due to the unavoidable linkage of the Lesotho economy with that of the Republic of South Africa, most price levels for inputs, outputs, and food are determined in the RSA based on economic conditions there.

b. Marketing

Marketing is a major constraint to agricultural development. Much of Lesotho's agriculture is done in remote areas without easy access to transportation or to market centres. Marketing costs, whether for inputs or products, are very high in this situation. Communications are irregular and, until the infrastructure is improved, an efficient market system will be exceedingly difficult to develop.

The government's role in agricultural marketing was limited prior to 1967, at which time policy was redirected to place agricultural supply and marketing in the public sector. Currently the Coop Lesotho, a government agency, has the mandate to orchestrate the provision of supplies and the marketing of agricultural products.

The Coop Lesotho presently operates 56 branch stores throughout the country. Products marketed include maize, sorghum, wheat, peas and beans. Truck crops are often marketed by farmers themselves in open-air markets. People walk great distances to sell and buy produce.

c. Credit

The absence of a sufficient credit system was considered a major constraint by the survey respondents.

In 1980 the Lesotho Agriculture Development Bank (LADB) became operational as a national agricultural credit institution. LADB's only operating facility is located in Maseru. The lack of an institutional channel to distribute funds to rural districts has curtailed the effectiveness of the LADB.

d. Subsidy and import policy

Of all the economic and policy constraints, the respondents considered subsidy and import policies to be of least importance. This could be because the majority of Lesotho farmers are subsistence farmers and are not market-oriented. These farmers will not respond readily to production incentives or price signals. Furthermore, any subsidy or import policy is likely to be impractical because of the scarcity of funds for subsidies and the difficulty of controlling trade with South Africa.

4. Constraints related to rural traditions

a. Land tenure and farm size

The existing land tenure pattern and farm size were considered important constraints to achieving higher yields. The traditional communal land tenure system was considered to be a disincentive for investment in land and greater intensity of land use. The traditional tenure system has given rise to very small farms, averaging 1.4 ha. This pattern can be an obstacle to shifting from subsistence to commercial agriculture, or to taking advantage of improved technology.

b. Farm labour

The survey revealed the shortage of farm labour, particularly at peak periods of agricultural activity, to be an important constraint. (See 2.f.)

c. Education

Most respondents considered educational deficiencies to be an important constraint. The shortage of trained manpower to direct a strengthened agricultural sector and the lack of basic agricultural knowledge within the farmer/herder population are serious concerns.

5. Institutional constraints

The lack of adequate research, training and extension services was considered to be an important constraint.

Research is needed to provide solutions to the agricultural problems of Lesotho which relate to climate, rainfall, soils, and plant diseases. Training is needed to solve the need for skilled manpower, and extension to guide and direct farmers into the use of appropriate agricultural technology.

B. Livestock

The Basotho produce livestock for a variety of purposes, not just for market. In fact, in many households, sales of animals or animal products rank low relative to their other uses. Cattle, for instance, are used for draught power; a variety of animal products, such as milk, meat and hides, are consumed directly by families. Livestock provide a source of savings and marketable assets for families when cash is needed. Although livestock products, particularly wool and mohair, account for between 60 and 70 percent of national export revenues, it has been estimated that domestic utilisation of livestock and livestock products is the equivalent of three times the gross revenue earned from their export.

Lesotho's pastures are heavily overstocked. It has been estimated that it would require a stock reduction of 80 percent in the Lowlands and Foothills and 20 percent in the Mountains to bring Lesotho's pastures to the optimum carrying capacity.

The survey on constraints to increasing higher productivity of livestock and livestock products of smallholders dealt with beef and dairy cattle, sheep and goats. See Table 23 for the ranking of the importance of the constraints by the respondents. Since the constraints for beef and dairy cattle were, to some degree, different from those for sheep and goats, they will be considered separately in this section.

The respondents believed that if the constraints on livestock production are removed, and if the Basotho become more market-oriented, livestock productivity could increase by more than 25 percent.

1. Cattle

a. Physical and biological contraints

(1) Climate

Climate was given an average score by the respondents. This could signify that although the respondents recognise climate as a factor in cattle production, it is not considered to be an important constraint to higher production.

(2) Rainfall

Rainfall was not considered a serious constraint to increased production.

(3) Soil

The topography and the nutrient or physical condition of the soil were not considered to be serious constraints.

Table 23: Perceptions of Severity of Contraints to Achieving Higher Livestock Productivity[a]

Constraints	Beef Cattle	Dairy Cattle	Goats	Sheep	Average
Physical/Biological					
Climate	3.6	3.1	3.0	2.2	3.0
Annual rainfall	3.3	3.2	3.0	2.5	3.1
Rain distribution	3.7	3.7	3.4	3.2	3.6
Soil suitability	2.6	2.3	1.8	1.5	2.1
Soil degradation	3.2	3.5	3.7	3.8	3.6
Soil topography	2.9	2.7	3.7	3.3	3.2
Natural forage supply	4.7	4.3	3.4	4.0	4.2
Fodder supply	4.4	4.8	4.1	4.0	4.4
Other fodder supply	4.2	4.2	4.1	4.1	4.2
Water supply	3.6	4.3	2.8	2.5	3.4
Water access	4.2	4.4	3.2	2.8	3.7
Disease prevention	4.3	3.8	3.7	3.[illegible]	3.8
Curative problems	3.9	4.0	4.0	3.2	3.8
Pests/Insects	4.0	3.4	3.1	3.6	3.6
Predators	2.6	2.4	2.4	2.5	2.5
Species/Breeds	3.6	4.8	4.6	4.0	4.3
Economic/Policy					
Input prices	4.4	4.3	3.5	3.7	4.0
Animal prices	4.2	4.4	3.5	3.7	4.0
Marketing	4.4	4.0	4.1	4.3	4.3
Short-Term credit	3.4	3.3	3.2	3.6	3.4
Long-Term credit	4.2	3.4	4.1	4.0	4.0
Government subsidy	4.2	4.1	3.5	3.7	3.9
Import policy	3.5	[illegible].0	2.4	2.2	3.1
Traditional					
Land tenure	3.9	3.6	4.5	3.6	4.0
Farm size	3.9	3.4	4.0	3.7	3.8
Farm labor	3.3	3.3	2.5	2.2	2.9
Education	4.4	3.4	3.0	4.0	3.8
Role of women	2.5	2.0	3.0	2.6	2.6
Management Factors					
Herd management	4.1	4.2	4.0	4.0	4.1
Range management	4.9	4.3	4.6	4.6	4.7
Health management	4.4	4.0	3.6	3.6	4.0
Overall Average	3.9	3.7	3.5	3.4	3.7

[a] Weighted average of respondent rankings: 1 = Not serious, 5 = Very serious. Number of respondents varied by type of livestock from 9 to 10.

Source: Data collected from the DEVRES/SADCC Agricultural Research Resource Assessment, 1984.

(4) Nutritional factors

The supply of natural forage and fodder are considered serious constraints to increased production.

(5) Water

Both the supply of water and its accessibility are important constraints. Lesotho has many rivers and streams, most of which are inaccessible to cattle.

(6) Animal diseases and pests

Predators are not a problem in cattle production; however, insects and diseases are important constraints. Cattle suffer from a variety of tick-borne diseases, from mastitis, and from internal parasites.

(7) Breed

Poor breeds of cattle are considered a constraint. The Government of Lesotho is currently encouraging improving quality rather than increasing quantity of stock.

b. Economic constraints

The prices of inputs and animals, marketing, long-term credit, and subsidy policies are all considered to be major constraints. There are no major slaughtering or marketing facilities currently operating in Lesotho.

c. Constraints related to rural traditions

Rural traditions, especially regarding land tenure, are considered constraints to increased production. Communal grazing is a disincentive to farmers' investing in improving rangelands. Cattle grazing is under the supervision of herdboys, many of whom know little about animal nutrition.

d. Management constraints

Herd health and management along with range management are all serious constraints. For the most part, cattle are undernourished as a result of inadequate pastureland and inefficient range management practices.

2. Sheep and goats

a. Physical and biological constraints

(1) Climate

Seasons, temperature, annual quantity and the distribution of rainfall are not considered constraints to the attainment of higher production of sheep and goats.

(2) Soil

Lesotho's topography and soils are suitable for the raising of sheep and goats, but the respondents considered soil fertility and the serious erosion problem important constraints to the achievement of higher production.

(3) Nutritional factors

The availability of forage and fodder is a serious constraint. Sheep and goats are grazed predominantly in the Mountains and Foothills or following cattle in the Lowlands. During some seasons of the year, forage in these overgrazed areas is very limited.

(4) Water

The supply and accessibility of water is not a constraint.

(5) Animal diseases, pests and predators

Animal diseases are not a serious problem in the raising of sheep; however, they are of goats. Pests and insects are considered a constraint to increasing the productivity of sheep.

(6) Breed

The respondents consider poor breeds to be a constraint to increased productivity. The Government of Lesotho is attempting to address this problem by establishing sheep studs with superior germ plasm.

b. Economic constraints

Prices of inputs, prices of animals, marketing, availability of credit and subsidy policy are all considered important constraints. However, import policy is not considered a constraint.

c. Constraints related to rural traditions

Land tenure and farm size are serious constraints. The difference between communal and exclusive individual rights, long-term

transferable leaseholds and freeholds, are often discussed as issue of greater security under individual tenure. This greater security would provide greater incentives for investment in land and greater intensity of land use.

d. Management constraints

Herd management and range management are important constraints. Animal grazing is under the supervision of herdboys who have little knowledge of animal nutrition or range management. The ranges are overgrazed and, as a result, are affected by serious erosion processes. Animal health is not a serious problem, but sheep do suffer from scabs and internal parasites, problems which could easily be controlled with good management.

C. Summary of Major Constraints to Achieving Increased Production

1. Climate

With the exception of the southwestern region where rainfall is lowest, climate is not an overwhelming constraint. Good management, combined with the selection of adaptable varieties and the use of irrigation for high-value crops, will go a long way to ameliorate the impact of climate and rainfall.

2. Land resources

Soil erosion is one of the most significant constraints to agricultural productivity in Lesotho. This phenomenon is widespread and affects all regions. Annual soil loss owing to furrow and sheet erosion on arable land is more that 70 MT per ha in certain places. Rangelands have been severely overgrazed because of excessive overstocking, resulting in degradation of vegetative cover and consequent widespread erosion.

Lesotho cannot increase its production of agricultural crops by increasing the number of ha cultivated since the total available arable land is allocated. The destructive soil erosion must be checked and the soil saved.

3. Manpower

The most pervasive constraint to development in Lesotho is the shortage of trained personnel at most levels of responsibility and skill. While this is true for all government ministries, it is especially critical in agriculture and rural development.

4. Migrant labour

It is estimated that 60 percent of Lesotho's male workforce are migrant workers, leaving women in this age group with the primary responsibility for farming. This is an important constraint because

it leads to shortages of labour at peak periods of agricultural productivity. In addition, these absentee male heads of household continue to make the important farm decisions. As a consequence, delivery of many farm inputs is delayed with a resulting poor yield.

5. Economic factors and agricultural policy

Funding of local recurrent and capital costs of new development projects is extremely difficult and, if new projects are initiated, these may result in increasing the national debt. If growth in expenditures is not matched by increased revenues from new sources, debt service costs may limit investment in development activities for some time.

The lack of fully-developed agricultural policies for long-term development is also a constraint.

6. Land tenure

As a result of the land tenure system, the average size of holdings is less than 1.4 ha. Recognising that the land tenure system was creating smaller and smaller holdings which could not accommodate new technology or provide adequate livelihoods to farm families, the Government of Lesotho passed a new Land Act in 1979. This Act contains several articles which can be potentially useful in promoting increased production. However, it is believed that the land tenure system will continue to be a constraint to increased production over the next decade.

VII. STAFF ASSESSMENT OF INSTITUTIONS

A minimum of 15 staff members from each of the research, training and extension institutions were interviewed and asked to complete the questionnaire. This process was designed to determine the staff's perception of the level of importance of various constraints relating to the effectiveness of the institution in accomplishing its mission. The sample included both junior and senior staff members. The results of the assessment are presented in this chapter and are summarised in Table 24.

A. Research Division

The respondents to the questionnaire on problems affecting the capacity of the Research Division to meet its objectives highlighted the factors presented below.

1. Recurrent budget

Many people indicated that monetary support is neither consistent nor sufficient. They indicated that by the time funds are released, key steps of essential programmes are long overdue. This delay affects the timeliness of trials which would otherwise be beneficial to rural development.

2. Foreign exchange difficulties

It was stated that Lesotho generally does not encounter problems in obtaining parts, equipment, journals and books, or supplies. These are usually purchased from the RSA with a currency also used by Lesotho.

3. Quality and training of staff

The respondents felt that training for all levels of staff was extremely important and necessary. They expressed a strong interest in further training.

4. Facilities

While respondents felt that the number and capacity of the conference rooms were adequate, they felt the laboratories and offices to be inadequate in number and capacity. Most believed they were inadequate for the purposes for which they were intended.

5. Equipment

Almost all of the staff indicated that a lack of essential equipment and poor maintenance of what equipment exists were very important constraints.

Table 24: Staff Assessment of Research, Training and Extension Institutions[a]

Problems/Criteria	Research	Training	Extension	Overall Average	Number of Respondents: Research	Training	Extension
Budget:							
Consistency of support	3.9	4.3	4.8	4.3	15	14	19
Level of funding	4.1	4.2	4.6	4.3	15	14	20
Release of funds	3.8	3.4	4.6	3.9	15	14	19
Foreign Exchange Difficulties:							
For purchase of parts	3.4	2.6	3.2	3.1	15	10	5
For purchase of equipment	3.6	2.9	4.2	3.6	15	11	4
For purchase of books/journals	2.6	3.0	3.5	3.0	14	10	4
For purchase of special supplies	3.8	2.5	3.4	3.2	14	10	5
Senior Staff:							
Lack of training opportunities	3.8	4.3	4.4	4.2	15	15	19
Lack of interest in further training	1.7	1.4	2.2	1.8	15	14	18
Lack of experience/background	3.9	3.5	3.6	3.7	14	14	19
Lack of motivation	3.5	3.4	2.2	3.0	15	14	19
Lack of leadership	4.2	3.1	3.7	3.7	15	14	18
Junior Staff:							
Lack of training opportunities	4.5	4.3	4.9	4.6	15	15	19
Lack of interest in further training	1.5	1.6	2.6	1.9	15	14	18
Lack of experience	3.4	2.8	3.2	3.1	15	14	19
Lack of motivation	3.6	3.5	2.9	3.3	15	14	19
Support Staff:							
Lack of training opportunities	4.4	3.9	4.4	4.2	15	14	17
Lack of interest in further training	1.9	1.5	2.2	1.9	14	14	16
Lack of experience	3.6	3.4	2.9	3.3	15	14	15
Lack of motivation	3.9	3.6	2.8	3.4	15	14	13
Conference/Meeting Rooms:							
Number of conference rooms	2.8	2.8	1.9	2.5	16	14	19
Capacity of conference rooms	2.9	3.4	1.8	2.7	16	14	18
Adequacy of conference rooms	3.0	3.0	2.4	2.8	16	15	19
Classrooms:							
Number of classrooms	NA[b]	2.2	NA	2.2	NA	15	NA
Capacity of classrooms	NA	1.6	NA	1.6	NA	14	NA
Adequacy of classrooms	NA	2.1	NA	2.1	NA	14	NA
Laboratories:							
Number of laboratories	3.3	3.6	NA	3.5	15	14	NA
Capacity of laboratories	2.9	3.3	NA	3.1	15	15	NA
Adequacy of laboratories	3.2	3.4	NA	3.3	15	14	NA

Table 24: Staff Assessment of Research, Training, and Extension Institutions[a] (cont.)

Problems/Criteria	Research	Training	Extension	Overall Average	Number of Respondents: Research	Training	Extension
Offices:							
Number	3.8	2.9	2.4	3.0	16	15	19
Capacity	3.4	2.6	2.2	2.7	16	14	18
Adequacy	3.6	2.1	2.4	2.7	16	14	18
Equipment:							
Insufficient number/Obsolescence	4.1	3.6	4.0	3.9	16	14	20
Lack of repair/maintenance	4.1	3.9	4.3	4.1	16	14	19
Funds for essential equipment	4.4	4.3	4.4	4.4	16	15	19
Transportation:							
Budget for operations	4.1	4.0	4.5	4.2	13	14	18
Availability/Access	3.9	3.5	4.2	3.9	16	15	18
Adequacy of allocation	NA	3.6	3.6	3.6	NA	14	18
Maintenance/Care	3.6	3.2	3.3	3.4	16	13	18
Number of vehicles/bicycles	3.7	3.6	3.7	3.7	16	14	20
Staff Housing:							
Number of houses	4.3	3.9	4.7	4.3	15	14	19
Adequacy of staff housing	3.0	3.5	4.5	3.7	15	13	19
Salary Scales/Levels:							
Not sufficient to hold staff	4.4	4.6	4.6	4.5	16	15	20
No differentiation for remote posts	NA	NA	4.8	4.8		NA	18
Competition from the government sector	3.6	3.0	4.2	3.6	16	14	18
Competition from private sector	3.9	4.1	3.1	3.7	15	14	18
Promotion System:							
Promotion schedule	4.7	6.?	3.2	4.7	14	14	18
Rewards for superior service	4.3	4.3	4.8	4.5	15	14	19
Without higher training certificate	NA	NA	4.4	4.4	NA	NA	19
Staff evaluation procedure	3.6	4.4	4.8	4.3	15	15	20
Tenure System:							
Tenure security rules	2.8	3.1	4.2	3.4	14	14	19
Tenure for superior young staff	2.7	3.2	2.7	2.9	14	14	20
Other Benefits:							
Leaves of absence schedule	2.3	2.3	2.7	2.4	14	15	19
Health benefits	4.4	4.2	2.3	3.6	12	13	19
Retirement benefits	3.7	3.8	4.4	4.0	13	14	20

[a] Key to seriousness of Problems/Criteria: 1 = Not serious, 5 = Very serious.
[b] NA = Not Available, Not Applicable, or No Answer.

Source: Data collected from the DEVRES/SADCC Agricultural Research Assessment, 1984.

6. Transportation

The research staff indicated that the lack of sufficient funds to purchase and maintain vehicles is a serious constraint to the RD achieving its goals.

Since field substations are scattered to represent the country's agro-ecological zones, the availability of transportation is very important in order to conduct research at these stations.

7. Terms of service and benefits

The following conclusions concerning terms of service and benefits can he reached:

- o The RD has very few housing quarters for staff. The quality of the few available is very poor. Most senior officers live in private dwellings;
- o Most respondents indicated salaries were insufficient;
- o Respondents felt that the question of promotion is very important. They indicated there is an inadequate schedule for promotion, and that people are not rewarded for superior service. They indicated that they evaluation procedures are weak;
- o Schedule for leaves of absence is not considered an important problem; and
- o The respondents consider health benefits to be very important. They indicate that no health benefits are available through the RD.

B. The Lesotho Agricultural College

The survey of problems by the teaching personnel reveal that both the junior and senior staff feel that the following constraints are important and relate to the performance of the College: recurrent budget; quality and training of senior, junior and support staff; library; laboratory equipment; transportation; and terms of service and benefits.

1. Recurrent budget

The majority of the respondents felt that consistency of financial support and an increased level of funding would facilitate long-term planning and provide the opportunity to enhance the training programme. The lack of funds adversely affects the acquisition of library resources and the repair and maintenance of equipment.

2. Quality and training of staff

The Lesotho Agricultural College staff perceive the lack of training opportunities for all levels of staff to be of the highest concern. They understand the limited opportunities for training senior staff, because it is usually obtained overseas at a high cost. However, in-service training for junior and support staff could be held regularly within Lesotho.

A lack of appropriate background and experience of the staff is considered an important limiting factor as the institution strives to accomplish its purpose. Lack of motivation and interest was also ranked very high on the list of constraints.

3. Facilities

The library collection needs to be expanded and updated. There is neither an adequate number of books, journals or periodicals nor adequate breadth of subject matter covered in the existing publications. Books should be up-to-date and relevant to the course of study.

Students should have greater access to the library and, in particular, should have the privilege to borrow books for private use outside of the library facility.

4. Laboratory equipment

The Lesotho Agricultural College has good laboratories but they are insufficiently equipped. Furthermore, repair and maintenance of current equipment is not done in a timely manner.

5. Transportation

The respondents' main concern was the lack of a budget for effectively operating the vehicles. There was also a general feeling that the system could be made more efficient with improved maintenance and appropriate allocation of vehicles.

C. The National Extension Service

The following problems were identified by the respondents:

1. Recurrent budget

Inadequate budgetary support for operations was a unanimous concern of all respondents. Inconsistency of support, lack of sufficient funds and delays in the release of funds were all classified as extremely important problems.

2. Quality and training of staff

The great majority of the officers considered the lack of training opportunities for all levels of staff to be a very important constraint in the performance of the Extension Service. They also indicated that there is a lack of experience among the senior staff, which impedes the accomplishment of the extension objectives.

3. Equipment

The lack of funds to purchase and repair equipment is a very important constraint.

4. Transportation

In some districts, programmes are delayed or not conducted because of the lack of transport. Many districts with a staff of 30 at headquarters have only one or two vehicles.

5. Terms of service and benefits

The following conclusions concerning terms of service and benefits can be reached:

- o Housing is a major problem. There is an insufficient number and inadequate quality of housing at the district level;
- o The salary structure was subject to criticism. The levels were not sufficient and there was no differentiation for remote posting, except in the mountain region;
- o Promotion, recognition for superior service and performance appraisal were criticised by all as being inadequate; and
- o Health benefits and retirement benefits were considered by the respondents as being very important incentives which are needed to encourage performance.

D. Summary

Respondents from each institution indicated similar responses to most questions. They were especially focussed on such items as: budget, equipment, transportation, terms of service and benefits.

Employees appear perturbed by the lack of consistent financial support for their programmes. They were concerned with the fact that funds were often released late, especially for winter programmes. Preparation for these programmes should be completed by the end of April, which is the first month of the fiscal year, but it is often delayed because of lack of funds.

Most employees indicated that there are very limited training opportunities at all levels. This situation is more severe for junior and support staff than it is for senior staff. Some junior staff attribute their lack of training to the fact that senior staff no longer visit them in their areas as often as they used to. They, therefore, are not aware of the training needs of the junior staff.

Respondents from both headquarters and the rural areas indicated that they lacked adequate transportation. In a country with as rugged a terrain as Lesotho, good transportation to visit farming areas is essential. Initially, EAs used horses to travel in their territories. However, with the rangeland deterioration and the increase in workload, that mode of transportation is no longer effective.

As the development of Lesotho's agricultural sector advances, the need for more sophisticated equipment for research, extension and training becomes especially essential. Respondents, therefore, strongly indicated that lack of proper equipment and its timely repair and maintenance hindered the progress of their work.

Respondents indicated that the MOA is losing staff to outside sectors, especially the RSA, because of the comparatively low salaries paid in Lesotho. This factor affects work performance, because the remaining staff are spread too thin.

The question of staff housing was also rated as a very high concern by all respondents. Work at institutions like the RD, the LAC and especially the Extension Division requires that staff be available on demand. Adequate on-site housing would improve job performance because the staff would be more readily available to tend to experiments, students' and clientele requirements. As it is, most employees, including senior officers, live long distances from their job sites, because housing is not available nearby. This reduces the effective work day, and does not motivate employees to work beyond the official hours.

On the question of retirement respondents said benefits were too low, because of low salaries. They regarded health benefits as very essential, but at the present moment there are none. Respondents feel that with ever-increasing health costs, the GOL should provide health insurance.

Opinions were divided on the question of tenure. Most people felt it was not an important constraint, but that the young staff members should be given more opportunities to develop their potential. Reponses on promotions, even though indicated as very important, included sympathetic comments because people are aware of the tight national budget. They stressed that superior service should be rewarded. Currently, there are fixed grades for professionals which do not provide opportunity for advancement. Administrative positions pay higher salaries; therefore, professionals accept these posts to increase their salaries.

Informal discussions at the Directorate level suggest that many of the above problems could be rectified if some sacrificial efforts were made towards improving linkages. Linkages could result in timely and coordinated training of all people involved in agricultural production such as MOA, staff and farmers.

It was also mentioned that the implementation of the directives in the RD policy paper would solve many problems. One proposal is that a Research Council (RC) be established, including officers from the major divisions of the MOA. The RC would review all research project ideas; only those approved by the Council would be funded. The RC would provide an essential link between MOA divisions. The divisions represented on the RC would be committed to, and have greater confidence that the RD was addressing, the priority needs of Lesotho's farming community, because they would be a part of the decision-making process.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Constraints to agricultural productivity were discussed in Chapter VI and will not be repeated here. This chapter will present some strategies to deal with those constraints.

A. Strengthening Lesotho's Agricultural Institutions

1. General

Lesotho's principal agricultural institutions can be strengthened both through specific actions particular to each, as noted in the sections below, and through implementation of the following general recommendations:

- Creation of formal linkages between the Research Division, the Extension Service and LAC. These linkages would help increase the productivity of all three units; they could be initiated through some appropriate joint appointments of personnel and through a memorandum of understanding which would specify lines of communications and avenues for joint planning and programming;

- Establishment of a national computerised data base. This data base should contain, as a minimum, the description, objectives, procedures, results and recommendations for all agricultural research activities. At present, Lesotho's archives and libraries lack information on all but the most recent of Lesotho's excellent agricultural research conducted over the decades. The numerous agricultural activities in progress, supported by donor countries and the GOL, have only minimal coordination and sharing of data. The human and financial resources which would be saved through a well-organised and comprehensive data base could then be directed to solving high-priority problems. The net effect would be increased agricultural productivity. A first step in establishing this would be the compilation and assessment of all agricultural projects over the past 25 years, chronicling all successful projects and specific successful technologies and making this information widely available;

- Reinforcement of the commitment of the GOL to improving the quality and relevance of education. This hopefully will provide well-prepared students to pursue higher education in agriculture, thus helping both to fill the staffing needs of the agricultural institutions described in this report, and to provide a skilled population at all levels of the agricultural sector:[1] and

- o Pursuit of more and better focussed long-term donor funding. This may prove a prudent strategy, considering the budgetary constraints faced by the GOL. Carefully coordinated and focussed on the most pressing priorities, these donor projects could better solve problems, leading to increased productivity and increased revenue which, in turn, could be used to cover recurrent costs.

2. Research Division

Specific recommendations for the Research Division include the following:

- o Continuation of the plan to strengthen the RD through long-term, advanced training and through the interim employment of expatriates;

- o Provision of funding to adequately cover the recurrent costs of research and to support increasing levels of on-farm applied research; and

- o Development of means to ensure that statistically-sound findings from applied research are made widely available to farmers, leading to higher yields and greater efficiency in production and marketing.

3. Lesotho Agricultural College

Specific recommendations for LAC include the following:

- o Strengthening of the LAC staff by increasing the number and level of qualified nationals. Emphasis should be placed on agricultural production and the practical aspects of farm management;

- o Careful reexamination of the curricula with the view of specialising in areas in which LAC could make contributions of special value to agriculture in Lesotho and the SADCC region. Soil and water conservation and range management, in particular, are areas in which Lesotho may have a comparative advantage; and

- o Conduct by LAC of high-quality, relevant in-service education courses for extension workers, and development of programmes which complement the training of farmers currently given at the Farmer Training Centres.

4. Extension Service

An effective delivery system which leads to the adoption by farmers of improved practices and materials will result in increased

agricultural productivity. Specific recommendations for thus strengthening the Extension Service include the following:

- o Launching of a massive training programme to increase the competence of the EAs and SMSs. This should include short-term, on-the-job training in specific subjects, as well as long-term, academic training. In addition to the training needed by all extension workers, certain areas of training appropriate to their positions should be provided for administrators, supervisors and specialists. This should include training in management, programming, supervision, monitoring, and extension methodology. Much of this training could be done within the country through NUL, LAC and the RD. Once extension workers have achieved a high level of competence, this should be maintained by a well-designed plan of annual in-service training activities;

- o Consolidation of the extension service of the MOA's Technical Division and the Extension Division. A single line of administration would help achieve more efficient use of and greater output from personnel, materials and equipment;

- o Provision of adequate transport for extension workers. The availability of transport at the village and district levels should lead to increased and more timely contacts with farmers; and

- o Provision of additional resources in the form of teaching aids--e.g., leaflets, posters and bulletins--and materials for field demonstration projects.

B. Dealing with Constraints to Agricultural Productivity

Actions addressing direct constraints to improved agricultural productivity are possible in numerous areas. What follows is a brief discussion of the most important of these constraints.

1. Agro-industry

The GOL should encourage the development of the agro-industrial/agribusiness sector. Policies and incentives necessary to serve as catalysts to this sector should be instituted. Furthermore, research evaluating the effects of such policies and incentives could increase the effectiveness with which they are applied.

The processing of field crops, livestock and livestock products into various consumer goods not only increases the value of these products, but it also provides a reliable market for farmers. The expansion of agro-industry thus would have a positive impact on prices paid to farmers and would provide needed jobs for Lesotho's increasing labour force. Such an impact is demonstrated by the successful

Lesotho Flour Mills, which has provided a reliable market for wheat and which employs 300 people.

2. Land tenure

A nationwide education programme explaining the strength and value of the 1979 Land Tenure Act would help to overcome constraints related to small land holdings, such as the need for collateral in order to obtain credit.

The judicious use of land leases and the declaration by GOL of selected agricultural areas for commercial agricultural production could lead to significant production increases.

3. Soil and water conservation and range management

Present activities should be continued and expanded. Donor countries should be persuaded that these are critical problems which can only be solved over time. Therefore, projects should be funded for the long term, eg., for 20 or 25 years. Conservation systems developed in Lesotho could become models for use in other nations with similar ecological conditions.

4. High-value cash crops

The Northern Lowlands would be suitable for the production of fruits and vegetables if the land in the area were irrigated. A project to encourage the labour-intensive production of vegetables on a commercial scale would provide jobs, substitute for imports and assist in reducing the national debt.

5. Socially-appropriate technology

Sociological research could contribute greatly to better implementation of improved agricultural technologies and management practices. For example, migrant labour has resulted in women greatly outnumbering men in Lesotho's de facto population. Women provide the majority of the labour for crop production, but by social custom they do not make the major farm management decisions. Through research on the dynamics of farm management decision-making, sociologists could help devise means to better integrate Basotho women's day-by-day knowledge of on-farm conditions. Another challenge to sociologists would be to develop techniques to miximise the acceptance of new technologies. A third opportunity would be devising ways to make alternative conceptions of cattle more acceptable, such that farmers raise cattle, sheep and goats for commercial purposes and not merely as a demonstration of wealth. Developing solutions to these problems would assist in increasing agricultural productivity.

6. Soil fertility

Acceptable practices must be developed and disseminated to improve soil fertility. These could include:

- o Ploughing under of stubble;
- o Reduction in the livestock population, thus leaving more plant matter to be turned under; and
- o Expansion of the use of legumes in fertility-building crop rotations.

Use of manure to improve soil fertility would not be accepted unless the availability of firewood were increased.

7. Infrastructure

Increased road construction and repair would greatly facilitate agricultural commerce in Lesotho's mountainous terrain. The transport of agricultural inputs and outputs is slow and tedious, discouraging commercial production.

---

[1]A GOL Education Sector Survey Task Force uncovered a number of key issues in 1982. First, there was evidence that there has been a decline in the performance of students in the basic skills of reading, writing and arithmetic. Second, there was a consensus that the educational system was not oriented to serving Lesotho's needs. In particular, students were not gaining the values, understanding and skills that might lead to productive wage or self-employment.