

**Agricultural Sector Assessment**

**L E S O T H O**

*This sector assessment was undertaken in conjunction with the Southern Africa Development Analysis Project and has been used extensively, but not totally, in the Main Report and Country Papers*

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GLOSSARY OF TERMS AND ACRONYMS

ASA	Agricultural Sector Analysis
BASP	Basic Agricultural Services Program
LASA	Lesotho Agricultural Sector Analysis
LMC	Livestock Marketing Corporation
PMC	Produce Marketing Corporation
RSA	Republic of South Africa
SADAP	Southern Africa Development Analysis Paper
SAM	Section Analysis Model
UN	United Nations
USAID	United States Agency for International Development

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SADAP: AGRICULTURAL SECTOR ASSESSMENT FOR LESOTHO

I. INTRODUCTION

The literature in Lesotho is rich in describing the physical characteristics of the country, its expressed goals by sectors of the economy, (five year plans) and where development is at the current time. Books have been written on Lesotho's people, education, religion and institutional arrangements such as land tenure, migration, etc. However, little evidence could be found where anyone has taken a hard look at Lesotho's future potential and made suggestions as to optimum strategy for long-run development.

There are several reasons why development efforts and planning have not moved much farther than the "here and now". First, the data base is extremely shallow for all phases of the economy. Numbers are created for a particular purpose and represent no more than guesstimates. Unfortunately, these numbers are often used out of context and reported as "fact" as if developed from objective research procedures.

Secondly, there exists little trained man-power or the funding to do in-depth objective analysis of economic relationships. Just recently, a scope of work was prepared for an agricultural sector analysis. It will require model formulation, data collections and operational analysis. This project has been submitted by the LASA (Lesotho Agricultural Sector Analysis) Team. It will represent a joint effort of the Economics Department of Colorado State University and the Ministry of Agriculture in Lesotho.

The LASA Team has already finished a summary report. The agricultural sector review report (LASA, 1978) is a detailed survey of existing literature of agriculture and related institutions. It will serve as a basic technical reference for this SADAP assessment. Other references will be cited when it is necessary to refer to original sources.

It is impossible to project the outcome of LASA's ASA effort. A critical issue here is how will capital and technical resource allocation be made during the time from now until the model results are available. Can general guidelines for economic development be structured without the precision of an ASA study? Such guides would be helpful to Lesotho's government officials, USAID and other resource donors.

A primary purpose of SADAP is to formulate a set of broad guidelines based on the best knowledge available. This task will be attempted by an agricultural economist with the technical assistance of specialists in natural resources, transportation, and livestock. First, a framework for sector analysis will be presented. Then the report will contain a discussion of the current situation and likely changes expected in the future. Actual data citation will be very minimal.

The evaluation of the current situation will be used to develop a set of premises (statements of presumed facts and projections). These premises will be used to formulate a long-run development plan for the agricultural sector and how implementation of the plan will affect development efforts in Lesotho.

## II. THE AGRICULTURAL SECTOR FRAMEWORK

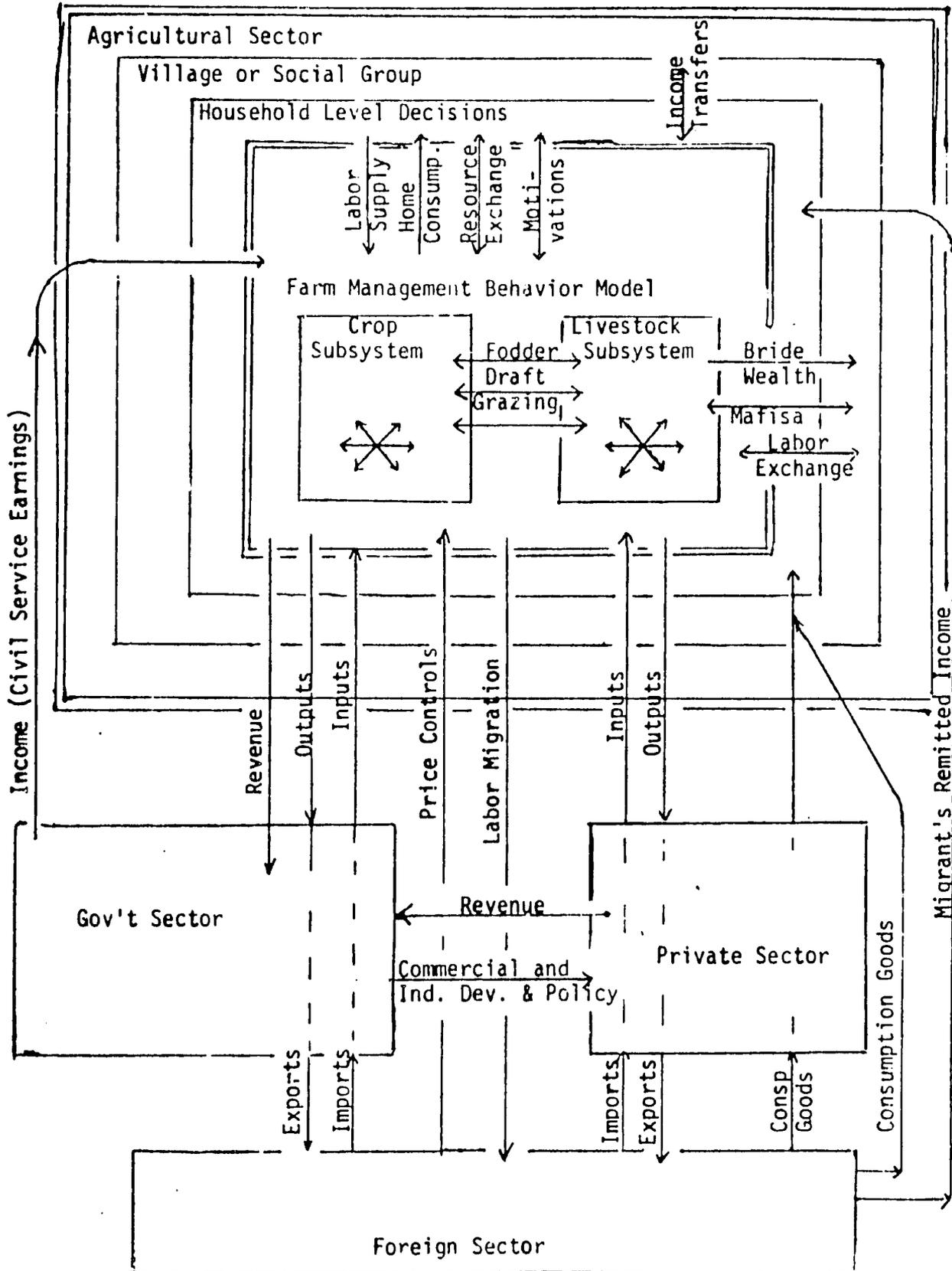
The structural framework of the agricultural sector in Lesotho is not too difficult to visualize. Any development analysis must deal with resource base applicable to both production and marketing of commodities in the important subsectors. These resources are the same in Lesotho as in any other country, i.e., land, water, labor, capital, the environment and management. These resources in Lesotho must be related to the following six subsectors: (1) cash crops, (2) food or subsistence crops, (3) livestock, including draft power, (4) forage crops and pasture grasses, (5) forestry, and (6) fisheries. The latter two subsectors are considered to be complementary or possibly supplementary in nature. Omission of detailed discussion of forest and fisheries does not imply that they are not important to Lesotho's development goals. They are very important but one would not consider them highly competitive for the major scarce resources.

The inter-relationships between resource uses in producing and marketing the several commodities are restrained by many economic, social, political and technical forces in the economy. For a lack of better terminology, these forces will be referred to as policy variables, many of which can be manipulated by the development planners. Included in these policy variables are such institutional arrangements as: (1) monetary, trade and labor agreements with the Republic of South Africa (RSA), (2) inter-relationships of the agricultural sector with competing sectors, the government and foreign donors, (3) land tenure arrangements, (4) population variables, (5) attitudes concerning family planning, the role of women, educational opportunities, savings and investment goals and

changing mentality regarding subsistence farming, (6) education and creating of knowledge (research), (7) services of government vs. private enterprise, and (8) government taxation and the handling of labor remittances resulting from employment in RSA.

The inter-relationships of the sector framework is fairly well depicted in the attached flow chart presented originally in LASA's project proposal. An addition to the sector analysis model "SAM" might be an agricultural marketing behavior model which would incorporate both private and public service activities. In any case, it will serve as a guide in this sector appraisal and synthesis of literature.

Possible Structural Organization of a Sector Analysis Model (SAM) as Presented in LASA Proposal, 1978



### III. ANALYSIS OF CURRENT SITUATION AND TRENDS

#### A. POLITICAL REALITY OF LESOTHO

##### 1. Relationship with RSA and Other Countries.

Lesotho's political ties with RSA are unsettled at the current time (Segun, 1977). Conflicts have arisen because of the apartheid policy of RSA, possible restoration of conquered territories, and the independence declared by RSA for the Republic of Transkei.

This appraisal assumes that economic ties with RSA are so critical to Lesotho's long-run future that political differences will take a secondary role in relations with RSA. These economic ties are (1) a common currency in which Lesotho depends on RSA institutions for monetary and fiscal policies (control of inflation), (2) employment of the Basotho in mine, farm, and domestic activities, (3) trade of both capital and consumption items, and (4) communications, energy and transportation with the rest of the world.

##### 2. Trade and Balance of Payments.

Trade with the Republic of South Africa has grown sharply with imports exceeding exports by a wide margin (LASA, 1978). Currently, Lesotho produces less than 45 percent of total consumption of foodstuffs. Trade statistics for several years including 1976-77 are included in the Bureau of Statistics Report (1977). Coarse grains and wheat lead the list of agricultural imports while cereals, wool and mohair are exported to the RSA in the raw state (MF-1977). The deficit is expected to continue at equally or higher levels. Labor remittances, custom union revenues and foreign aid are sources of funds for financing the deficit.

3. Lesotho's Position in the Black Independence Movement.

Support will be given to the black independence movement, but it is not likely to be permitted to endanger the economic ties with RSA. Serious economic repercussions for the Basotho would be certain if an economic boycott with RSA was brought about by either party.

4. Linkages with Black African Countries.

Economic ties with the black countries, especially Botswana and Swaziland, are not significant. Trade with Black Africa cannot be considered a viable option for many years because of high transportation costs and limited markets in these countries. Trade with any country outside of RSA represents a very expensive venture given world marketing conditions and the problems of gaining access to markets outside one's own country.

5. Domestic Policies of Importance to Agriculture.

a. Foreign Exchange Rate Structure.

The medium of exchange is the South African Rand. Approval has been granted to establish a separate medium of exchange. However, the Rand would still be recognized as legal tender. It is anticipated that policies (monetary, fiscal and reserve bank) of RSA will be effective in keeping the Republic in the world market. Lesotho should be able to capitalize on this relative stability even though few goods are bought or sold from countries outside South Africa.

b. Role of the Ministry of Agriculture and Related Institutions.

Public institutions will apparently become more important in program planning and implementation, operations and control. The Ministry of Agriculture is likely to gradually replace private concerns in buying and selling of both inputs and products. Marketing of agricultural

products will likely become a public utility, possibly heavily subsidized by Government. The Produce Marketing Corporation (PMC) and Livestock Marketing Corporation (LMC) will likely become the exclusive import/export agents of agricultural products and inputs.

Much talk is heard about the unfair exploitation of farmers by private traders. There is a contention that traders are not providing the necessary marketing outlets and creating effective demand. There is probably some truth to the latter, especially in the remote areas of the country. Obviously, costs of assembling, packing, marketing, and absorbing quality losses are extremely high in a country with no large urban areas. The purchasing power of the Basotho is low and widely scattered geographically. Even the Government will find it very costly to provide these marketing services. History to date suggests that the Government is not efficient in performing commercial activities, e.g., Coop-Lesotho and Livestock Marketing Corporation are in deep financial difficulty. Creation of effective demand depends on purchasing power, advertising, and promotion. These areas of business activity are new to Lesotho.

Research institutes of the public sector are weak and qualified staff will not be available to strengthen this critical area of service for several years. The level of instruction at the University will not be sufficient to give significant help in investigating problems in agricultural production and marketing.

Development of cooperatives requires a producer orientation far removed from individual motivation. The disposition of farmers does not appear conducive to the development of cooperative product markets. This would require much more active participation by the male of the household. Consumer cooperatives may be feasible if limited to the basic consumer items. Education with respect to the benefits and costs

will be required before consumer cooperatives offer any real hope in servicing the rural isolated poor families of Lesotho.

Marketing Boards in Lesotho do not exist and are not likely to effectively serve as feasible institutional arrangements as long as RSA maintains its price regulating marketing boards. It appears that the wool and mohair markets are being effectively handled by the RSA Boards.<sup>1</sup> Prices of most commercial farm products will continue to be determined by prices in South Africa minus transportation costs. Local Lesotho market prices of agricultural products will have to reflect this price level. Unfortunately for the Basotho farmer, the South African price will be determined on the basis of highly efficient RSA farming units much larger and more capital intensive than those which exist in Lesotho. Also, weather patterns are much more conducive to production in RSA.

c. Price Controls on Commodities

The flexibility of using prices as a tool for subsidizing agricultural production is extremely limited as long as free movements of products are allowed across the RSA border. The lack of control of product movement renders this option ineffective in potentially stimulating farm production. Consumer prices (sufficient high to induce increased output in Lesotho) would be far too high to restrict imports from the Republic.

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<sup>1</sup>There is an alternative to the RSA wool and mohair marketing boards, i.e., the local government marketing and processing facilities. The latter have had and will continue to have problems until quality and quantity of final products are sufficient to attract international buyers. They are a long way from that point now.

d. Taxation.

Indirect and direct taxes are sources of capital for development. Both types of taxes are levied to raise revenue. They may be used to guide adjustments in resource use. It is difficult to see how major changes in enterprise selection, savings and investment in farming can be brought about in the near future with the current investment climate. Property taxes on land, although not individually owned, and livestock may be one approach to encourage improved farm management and marketing practices. Communal grazing rights may become more functional if an equitable taxing scheme could be devised.

Taxing of wages received by laborers employed in South Africa may be a feasible option to offset production losses in the farming operations as a result of their absence. Further study of this alternative is warranted but not policy action is anticipated in the near future.

B. CULTURAL ASPECTS

1. Population

The last reliable estimate on population was provided by the 1976/77 census. Total residents in the country numbered about 1.2 million. The composition of the total population was 48 percent male and 52 percent female. The annual average growth rate since the previous census in 1966 was 2.27 percent. An interesting discussion of population trends and characteristics is presented in LASA (1978). A few general relationships will provide a basis for understanding the importance of the human resource.

About 40 percent of the population is less than 15 years of age. The same percentage exists for working age males (15-55 years). This represents

the pool for employment in RSA. About the same percent of females (15-40 years) is of child bearing age. This suggests that population growth could potentially grow at an even greater percentage than cited above if health, nutrition and incomes showed marked improvements. One implication is that a birth control education program should be seriously considered.

The regional distribution of population and its current migration patterns are factors which a sector analysis needs to consider. Jilbert (1978) provided estimates of regional dispersion as follows: Lowlands - 54 percent; foothills - 13 percent; mountains - 6 percent; mountain valleys - 19 percent; and the Orange River Valley - 8 percent. This growth in population since 1966 favored the lowlands with a 31 percent increase. A shift in population density appears to have occurred between the mountains and lowlands. The rapid growth of Maseru is one indication of a rural to more urban living.

## 2. Traditional Attitudes and Practices.

### a. Land Tenure.

A land tenure system exists in Lesotho which few western observers have had the opportunity to study. An excellent review of the system is presented in LASA (1978). It is apparent that this tenure system cannot be ignored in any sector analysis since any significant changes in the set of rules are rather remote. The fact that the system continues to exist gives some indication of the attitudes and dispositions of the Basotho.

The fundamental principle of both administration and tenure of land in Lesotho is that "the land belongs to the Nation". The use of land is

determined by an area chief. The chief's rights are described in LASA (1978) but the important aspect of the system vis-a-vis sector analysis is that use rights do not equally apply to livestock and crop farmers. For example, crop farmers are granted the right to small tracks of arable lowlands during certain months of the year. Once the harvest is completed, this land reverts to communal grazing rights. Yet the livestock farmer has communal grazing rights the entire year in the foothills and highlands. The crop farmer is limited to an area sufficient for subsistence. Population pressures have reduced the number of fields. Migration to the lowlands will continue to affect the size of area a farmer has to produce a meager existence.

Residential rights take priority in land allocation. Residential lots sometimes include a sizeable area for gardens. A movement from rural to urban areas can have an impact, therefore, on lands for crop production.

The security of land holdings is one apparent problem of the land tenure system. Douglas and Tennant (1952) seemed to think the system is workable with continuous occupancy running for most of the expected working period of a farmer. Other writers do not think there is such security in the system. Thus, there is little incentive to make capital improvements, conserve soil and follow recommended practices. It certainly provides little flexibility for farmers to expand operations for more effective employment of capital using technologies. Share-cropping is one way around the size-of-unit problem. There appears to be little reward in improving productivity. The penalty might be the loss of land.

The tenure system is an institutional restraint which must be incorporated into a sector analysis. The following premises summarize the future status of the laws:

- (i) Little change in the rules to make land a marketable resource, private stock of wealth or encourage capital intensive activities is visualized;
- (ii) Communal grazing rules will continue;
- (iii) Land security of use rights will remain unchanged;
- (iv) Residential growth and population pressures will continue reducing farm unit sizes or numbers.

b. Inheritance of Wealth.

The customary use of land (typical in western countries) to transfer to heirs is limited by the land tenure system. Wealth in livestock can be transferred which makes livestock a hedge against inflation and a potential source of old age benefits.

Inheritance laws are relatively vague in terms of land transfer. Land, of course, may or may not be reallocated to the heirs. Presumably other forms of wealth are passed through generations. The fact that land and improvements belong to the State certainly has an influence on capital accumulation. One can easily see why livestock is used as a stock of wealth.

c. Roles of Chiefs and Other Leaders

These leaders have held a prominent economic position in rural areas of Lesotho. They affect many lives through their resource allocation function.

There is no indication in Turner (1978) and LASA (1978) that changes in the current functions of regional chiefs will be forthcoming. They will continue allocating land to farmers and reserving resources for use in emergencies. However, their dominance may gradually decline as urban areas develop.

3. Role of Women in Households and on the Production Units.

a. Traditional vs. Modern Occupations.

Women comprise a large share of the labor force in agriculture. This is essential since the number of Basotho black migrants at work in South Africa in 1976 was estimated to be around 200,000, mainly males, by van der Wiel (1977). Agricultural tasks on many units will continue to be performed by the female left behind while her husband works in RSA. The ability and the cultural sanctions of doing heavy work chores (plowing) will limit the production of food and cash crops for the foreseeable future.

Traditional occupations (women weeding, harvesting, etc.) are well delineated. However, few males are left on farms to do their traditionally heavy tasks.

Share-cropping and equipment pooling will likely increase in importance in Lesotho agriculture. The latter will be brought about by Government, primarily the Basic Agricultural Services Program (BASP).

b. Family Planning Attitudes.

Family planning attitudes tend to focus on the large family for labor and for security in old age. The use of birth control devices to regulate size of family will require an intensive educational effort not yet undertaken. Religious constraints are also prevalent. Government has not mounted an intensive effort to emphasize the need and the methods of controlling population. It appears that a population growth rate in

the area of 2-2.5 percent annually will prevail for several years. Crisis conditions will be required to change the attitude towards the right to reproduce. This is unfortunate since economic improvement in the long-run may well depend on population policies.

c. Education Opportunities.

Emphasis has been placed on up-grading education at all levels (Second Five Year Plan, Volume 1 and 2, 1975). The literacy rate is high relative to other Black African countries. Education deficiencies do exist at all levels, especially at the professional and technical support levels. Improvement of the educational base is a slow process, one which is not expected to help improve agricultural productivity in the next few years.

The literacy rate was estimated by a World Bank Mission at 40 percent (World Bank, 1975). As expected the educational level of people in the lowlands is considerably greater than highland people. Although Lesotho has patterned its educational system after the developed western world, the quality of instruction is low due to a critical shortage of teachers and funds for training.

The objectives of the Second Five Year Plan are to improve the quality and efficiency of education at all levels by placing Government with control and supervision of educational activities. In the past, the drop-out rate has been very high at the primary level. The student-teacher ratio is much too high to attain a conducive learning environment.

Problems at the secondary level greatly reduce the potential for effective teaching at secondary and adult training schools. There are a few trade and technical schools but facilities and faculty are in critically short supply.

The National University of Lesotho was established in the mid-seventies. It occupies the same site as the former University of Botswana, Lesotho and Swaziland. LASA (1978) cited the student-teacher ratio there at 6.5:1 with an enrollment of 500-600. Larger numbers could be taught with this faculty if facilities were available and qualified students could be recruited.

C. ENVIRONMENT CONDITIONS AND CONSTRAINTS.

1. Geographical Considerations.

The Kingdom of Lesotho is one of the least developed countries of the world in terms of commercial activity. It is a landlocked, mountainous country totally encompassed by RSA. The country is bounded on the west and north by the fertile Orange Free State Province, on the east and southeast by the Natal Province and Transkei and on the south by the Cape Province. Maseru, the center of Government and some commercial activity is located near the border of RSA. In fact, most of the major towns or centers of commerce are located along the border of RSA. This gives them far better access to RSA towns than to other potential commercial centers in Lesotho.

Lesotho has been divided topographically into 5 regions by Douglas and Tennant (1952) and Moody (1975). An understanding of these topographical areas is important in defining the agricultural development potentials of Lesotho. The regions are as follows: (1) border lowlands, (2) lowlands, (3) foothills, (4) Orange River Valley, and (5) mountains. These regions exhibit distinct climatic conditions, temperate ranges, vegetational growth, altitudes, soil types and qualities and human resources which make agricultural sector analysis and, ultimately, planning extremely difficult. The significance of these zones is discussed in Moody, 1975

but a point of emphasis might be made by the fact that the mountain region comprises around 60 percent of the total land area but consists of less than 20 percent of the arable soils.

2. Soil Types.

The consensus of all observers is that soils are extremely shallow, infertile and subject to further erosion. They are relatively acid. Soil types and potentials are described adequately in several sources, but a good summary is included in LASA (1978) and Seckler and Nobe (1978).

Lesotho has come a long way in classifying soils by physical characteristics and crop potential. However, there is little evidence that cropping patterns are very compatible with fertility level. Practices have been followed to a limited extent to conserve soil from erosion but few practices were observed to improve the organic matter or the fertility levels of the soils. The section on land use will provide more information on how soils are used.

3. Rainfall.

Rainfall is highly variable seasonally. The distribution of rainfall is described in LASA (1978). The important aspect of rainfall in Lesotho is its distribution over short periods of time. This causes extreme soil erosion. Expensive soil conservation methods are required to control erosion. Rainfall in the lowlands is not adequately distributed in the summer growing period to produce high and consistent yields of food and cash crops. Irrigation would be needed for improving cash crop yields because of the high yield risks of dry-land cash-crop farming.

4. Temperature.

Weather patterns would appear to be satisfactory for agricultural production with the exception of late spring and early fall frosts. The growing season is sufficient to produce most field and truck crops. In fact, many crops not now grown could be grown in selected areas of the country if temperature was the only limiting constraint. Education in production and consumption of these products would be required. Fall truck crops such as the greens, fall potatoes, turnips, etc., should be adaptable to the home gardens. Spring growing conditions look favorable for garden peas, snap beans, squash, pumpkin, cabbage, strawberries, etc. Citrus and semi-tropical crops could not be produced profitably.

5. Drainage and Erosion Problems.

Soil erosion is indeed one of the major problems facing Lesotho. The historical use of land with too much slope and on easily erodable soil has left the landscape scarred with truly huge gulleys (dongas). An estimated 50 percent of the nation's arable land is affected by erosion and an estimated 1 percent or more of the nation's topsoil is washed away each year through sheet and gully erosion. There are no serious drainage problems, except for some flood damage which accompanies the heavy rains.

6. Water Potential from Wells, Rivers and Lakes.

Water is considered one of Lesotho's major natural resources. However, there are several obstacles to its productive use. The two major obstacles are the extreme, seasonal fluctuation in the river flows due to rainfall patterns and the very high level of sediment load being carried by the water. The latter factor is a major hindrance to storage of water because of the extremely short life of the structure before it

is clogged with silt. There is general agreement that underground aquifers are widely distributed throughout the nation and the quality of water is generally very high. However, the sustained yield from these aquifers is thought to be very low, especially when measured in terms of the large demands associated with irrigation schemes.

IV. APPRAISAL OF EXISTING SUPPLY RESOURCES

A. LAND USE POTENTIAL

The distribution of arable area by regions is well documented in several reports. Generally acceptable numbers by regions are as follows:

<u>Region</u>	<u>Percent Cultivated</u>
Lowlands	30 - 35
Border lowlands	30
Foothills	10 - 15
Mountains	5

The total area considered by land use is shown below:

Land Use in Lesotho (Seckler, 1978).

<u>Type of Land</u>	<u>(1,000 Acres)</u>	<u>Percent</u>
Cultivated Cropland	914	12.1
Idle Cropland	<u>186</u>	<u>2.5</u>
Total Cropland	1,100	14.6
Range Land		
High Potential	3,000	39.7
Low Potential	1,760	23.3
Rockland, gullied lands	1,500	19.8
Villages, roads, etc.	160	2.1
Water areas	<u>38</u>	<u>.5</u>
Total	7,558	100.0

Less than 40,000 acres could be considered potentially irrigatable because of slope. A large share is marginal and of highly questionable

use for row crops. Most observers see little possibility of expanding the area for cultivation through reclamation projects. Costs of reclaiming marginal areas for crops are far too costly to warrant the investigation.

Existing cropping patterns are reported in Bureau of Statistics reports and Seckler-Nobe (1978). Production in acres of the major crops (for 1976-77) is summarized as follows:

<u>Crops</u>	<u>Summer (acres)</u>	<u>Winter (acres)</u>
Maize	240,455	
Sorghum	120,676	
Beans	46,993	
Wheat	66,602	31,860
Peas	14,656	8,088
Oats	114	146
Sunflower	1,156	
Lentiles	498	
Potatoes	2,163	
Barley	2,614	826
Teff	331	
Fallow	214,482	670,704
Vegetables		59

Livestock numbers on farms in 1976-77 are presented as follows:

Cattle	485,500 head	Donkeys	88,500
Sheep	1,128,000 head	Chickens	752,400
Goats	617,500 head	Pigs	75,500
Horses	104,100 head		

Future cropping pattern projections are that row crops will decline in acreage. Trends in productivity are impossible to project but the literature suggests that yields of cash crops are likely to remain low with high seasonal variability. Yields from livestock are also very marginal because of over-grazing of both summer and winter pastures.

#### B. LABOR CHARACTERISTICS

Agricultural labor is dominated by a high percentage of females, children less than 16, and people beyond the more productive working age. Farming by any standards is highly labor intensive but there is evidence that insufficient labor inputs are currently utilized to maximize either yields or economic returns. Some evidence points to a critical labor shortage at peak labor periods. Plowing is not timely, weeding seldom is done when weeds are competing with the crops for water and nutrients. Cash crops are particularly affected by untimely labor utilization. Unfortunately, serious under-employment occurs at times other than peak labor periods for crop production. Livestock herding could also be affected in the future by a shortage of labor if education should become compulsory.

A labor market does not really exist in the local farm sector. Laborers from the mountains could not be attracted to the lowlands to work on crop farms at the expected very low wage rates. Labor returns are extremely low as shown in the development projects (IBRD-1978). Wage rates

in RSA are too attractive to expect a quality labor force to remain in Lesotho. Average annual earnings in cash and kind of a Basotho miner in RSA in 1976 were a little more than R1500, (IBRD-1978). Thus hiring labor to work on Basotho farms is not a very likely occurrence or a feasible option.

### C. CAPITAL

Farming activities in Lesotho are not capital intensive operations. Little capital is used to purchase inputs, machinery and labor. Capital is required to purchase livestock but this capital stock already exists. Additional capital to purchase cattle is expected to come from RSA earnings of workers. Marketing activities are not capital intensive and little capital stock exists in marketing facilities.

Interest rates are based on rates established in RSA. The rates on savings and loans have been relatively stable despite inflationary pressures. The lack of wealth accumulation (land assets) leaves little basis to develop an agricultural credit (operating or capital) system. The Basic Agricultural Services Project (BASP program (W.B. 1524-LSO) has a credit component which should provide operating capital to the areas affected by the program. It is hard to see farming in Lesotho as ever being very capital intensive although the rates of return to additional capital might be high for mechanization of those activities affected by critical labor shortages. Limited credit to farmers has been available in the development projects at about a 10 percent rate. The repayment records in three projects have been reported fair but loans are rather insecure, i.e., little collateral.

D. TRANSPORTATION AND STORAGE INPUTS

1. Relative Importance of Transportation and Storage.

Transportation services are costly to provide in Lesotho. Roads are limited to the lowland areas. Paths and trails, passable to some extent by 4-wheel drive vehicles and animals, connect mountain and foothill villages to the marketing centers along the western border of Lesotho to the Republic. More discussion of transportation and storage is presented in Appendix 1.

2. Availability of Motorized Transport.

Most firms which offer trucking services in Lesotho originate in RSA. Trucks for-hire are not readily available to transport agricultural products. The cost of such a service would be very high.

3. Road Maintenance Capability.

Roads are not well maintained in Lesotho. It is not clear which ministry has the responsibility of road maintenance. Very few local funds are allocated to building roads and fewer funds are available to maintain existing roads. Equipment to maintain roads is not available. There appears to be a wealth of road building materials but the engineering dimension is in critically short supply.

4. Types and Frequency of Use of Storage Facilities.

Most storage of non-perishable products occurs on farms where grown. Grains entering commercial channels usually move to RSA for storage. There has been a large elevator built in Maseru to store about 30,000 metric tons of wheat. It still does not have the funding to construct a flour mill. Thus, grain may still have to be shipped to RSA to be processed.

There are some storage facilities for mohair and wool. Storage of inputs is limited but probably can handle the volume of inputs currently being used on farms. Cold storage is not available which causes some problems in marketing meats, fruits and vegetables.

E. OTHER INPUTS.

1. Fertilizers - The use of fertilizers is not widespread. The primary reason is due to lack of response to fertilizer by the native varieties and the high risks of droughts during the growing season. Budgets in the BASP project show little if any gains from fertilizer in gross margins for wheat, sorghum, beans, peas and maize. A price subsidy of 40 percent on 10-15-0 (25) resulted in little increase in returns for these crops in the northern and southern regions, (LASA, 1978).

2. Pesticides - Few insecticides are used on any of the above crops. Herbicides to control grass are sometimes mentioned but BASP proposal did not include them as necessary inputs.

3. Extension Services - Lack of roads, modes of transportation, and communication networks make adult education efforts extremely difficult and costly. Some extension activities have been included in the various development projects but cost effectiveness has not been evaluated. It is questionable if sufficient adaptive research results are available to make such production extension work feasible. Feasibility of consumer education (home economics) and family planning is an important issue needing exploration.

F. MANAGERIAL DECISION-MAKING

1. Sizes of Units.

Farming units are small with a given farmer holding 2 to 3 units of around 2 acres each. The units are usually separated geographically. The average sizes of each unit or field for 1950, 1960 and 1970 were 2.39, 2.24 and 2.26 acres, respectively (LASA, 1978). Arable land distribution in 1970 was the following:

<u>Size of Holding</u>	<u>Percent</u>
.01 - 3.99 acres	50
4.00 - 7.99 acres	34
8.00- 14.99 acres	13
More than 15 acres	3

2. Traditional vs Modern Practices of Management.

Management of farming units is provided by the male who is often absent in RSA when critical decisions are made. Traditional management practices are still in vogue. Needless to say, the level of management on most farms is extremely low. Simple recommended practices are not followed. The Soil Conservation Service has provided booklets on recommended practices but there is little evidence that the material is reaching the farmer.

3. Mechanization Practices

Little tractor power and complementary equipment is used. Simple tools for using with draft power are not utilized. Scarcity and costs of energy prevent very much mechanization.

4. Methods of Resource Allocation.

The only resources which are used to any extent is land, power, labor and seed. Traditional practices dictate the combination of these resources. There is little evidence that irrational decisions are frequently made. For example, fertilizer is not utilized very much, just because it is not profitable in dry land farming where dry weather frequently negates any benefits.

5. Evidence of Risk Averse Behavior.

There is ample evidence that the cash and food crop farmers are sensitive to high yield and price variability. As alluded to previously, fertilizer and other variable inputs are not used because losses due to drought are so much greater than with traditional methods.

G. POTENTIAL FOR NEW TYPES OF ACTIVITIES.

Some potentials for new activities do exist in Lesotho. Further processing of products produced in the country probably offers the greatest potential. The main agro-industry possibilities would seem to be grain milling, wool and mohair processing, and labor intensive "truck crops." Also, arts and crafts for the expanding tourist industry should be explored. Investments by the foreign companies would be beneficial for utilization of excess labor and keeping miners at home; however, it is unlikely that this will occur in the near future due to foreigners' perceptions that the political situation might be somewhat risky as well as the problems of higher energy costs, lower levels of skilled labor, etc., relative to RSA.

Expansion of the small further processing industry for wool and mohair would be a feasible alternative. Also milling of local grains could be done in Lesotho instead of exporting grains and importing meal,

flour, etc. The construction of the planned livestock slaughter plant could open up new opportunities for further processing of carcasses. Much of the beef in Lesotho would be excellent for grinding into hamburger for local consumption and for exporting to RSA. Also there is potential for utilizing labor for arts and crafts activities to complement the small tourist industry of Lesotho.

V. APPRAISAL OF EXISTING DEMAND CHARACTERISTICS

A. WHOLESALE AND RETAIL MARKETS

1. Availability of Markets.

Few wholesale and retail establishments exist in Lesotho. Commercial activity is limited to the few larger villages and towns and is performed by foreign, primarily South African, traders who sell South African products in Lesotho and purchase raw agricultural products for shipment to the Republic. The variety of products in the urban shops is broad. In the rural areas, however, small bodega type shops offer a limited choice of the more essential items. Farm supplies are available primarily in the major trade centers along the borders of RSA.

2. Role of Government in Marketing.

Recent developments in Lesotho suggest that private traders are doomed. Central government has established at least three marketing institutions (corporations) for the expressed purpose of providing competition for private traders. The general consensus is that nationalization of marketing activities will be the next step if these semi-government corporations are unsuccessful in displacing the private traders.

These three marketing institutions are the Livestock Marketing Corporation founded in 1973 for the purpose of providing a ready market for livestock and serve as the sole export/import agent for livestock products. This endeavor has not been successful in offering livestock producers a market. Its existence is currently in limbo and its functions have been incorporated into the livestock Division of the Ministry of Agriculture.

Co-op Lesotho, organized in 1958, is another arrangement designated the responsibility of purchasing, selling and distributing inputs and a few essential consumption items. The effective demand for practically all inputs is so thin and the service area is so geographically sparse that Co-op Lesotho is headed for hard times unless heavy government subsidy is available over an extended period of time.

The Produce Marketing Corporation (PMC) was established in 1974 but its activities have been very limited because of a lack of facilities and operating capital. PMC was established to buy and sell cash crops, primarily maize, wheat, beans, sorghum, and peas. The government is currently negotiating with foreign donors to greatly expand the physical capacity of PMC and upgrade the merchandising ability of the staff (McMillan, 1977).

There are other government marketing activities currently existing or planned such as the mohair plant, livestock slaughtering plant with complementary feed lots, asparagus processing plant, wheat milling plant and elevators. A fair appraisal of past projects is that they have been pursued to and through the "brick and mortar" stages but success in the operating stage has not been very cost effective. These projects have followed the same patterns as described for the soil conservation projects. Large sums of capital are initially expended on the project over a very short period of time but little operating and maintenance capital is allocated to insure long-term viability.

It would seem that the reversal of the trend of more government involvement in marketing will be hard to realize even though almost all government ventures to date have been unsuccessful. The supply/demand characteristics of the agricultural sector suggest that profitable marketing ventures in Lesotho

are likely to be hard to find whether operated by government or private enterprise. It is difficult to design activities which yield efficient assembly and marketing of products in small lots.

There does not exist a produce market (retail and wholesale) for truck crops. Fruits and vegetables are marketed in open areas of the villages or along the streets. Thus, the pricing function of a wholesale market is notably absent. Attention is needed in this area, specifically regarding a study of the feasibility of an inexpensive produce marketing facility in Maseru. A wholesale facility which would serve to provide an assembly point for perishable produce and to establish prices for such produce may have some potential for AID financing.

3. Market Accessability by Area of Country.

As alluded to above, markets are not readily accessible in the foothills and mountains. Livestock are brought to the lowlands where they can be marketed. Crops are grown in the lowlands where markets and roads are available. Thus, the common objective in many developing countries of having a market within a short distance of every farm site does not really apply for Lesotho.

4. Marketing Constraints and Restrictive Policies and Practices.

Lesotho is free of many marketing and production constraints/policies which hamper development. The shortages of effective demand, physical facilities and a commercial trading inclination are viewed as the major bottlenecks to improve marketing efficiency.

B. MARKETING INSTITUTIONS

1. Purchasing Practices and Credit Availability.

Traders generally purchase products on a cash basis and deliver the product from the farm to warehouse. Farmers are required to deliver

the product to the government owned operated marketing outlets. The latter usually posts a time for purchasing and a price of the product. Here again, the transaction is usually on a cash basis. As observed in many LDC's, traders do not practice giving credit to farmers and then binding the farmer to sell the product to them.

2. Market Information

The Lesotho Government has little market news or price information services on a daily basis as is common in western countries. Prices are reported on a regular basis in RSA. The Basotho with radios can get general price information as reported in RSA.

3. Grades and Standards.

Quality has not become an important issue in marketing agricultural products with Lesotho markets, with the possible exception of beans and peas. Grading is based primarily on an acceptable or unacceptable basis with no sophisticated pricing schemes to encourage production of quality products.

4. Degree of Competition at Various Levels in the Marketing.

This is a mute question. The system is too poorly developed and too little volume moves into commercial channels to be concerned with competition or the lack of it. Competition does exist in the Republic and prices are competitively set on products not regulated by Marketing Boards.

C. STRUCTURE OF DOMESTIC CONSUMPTION FROM EXPENDITURE SURVEYS.

1. Types of Goods and Service Consumed.

The diets of rural Basotho is very restrictive because of a lack of electricity required for refrigeration and storage of foods.

Very simple cooking facility usually a wood or coal fire in a barrel-type structure is used. The intake of food is surprisingly close to the recommended diet for Lesotho (LASA; 1978). Excessive intake occurs in the consumption of sorghum and wheat. Under-consumption of milk, eggs, meat, fish and beans were observed in the 1972-73 Household Survey (Gay and Guma, 1978).

Expenditures on housing, health, education, transportation, and recreation are apparently very low. Thus, most of the disposal income of a rural family is expended on food and possibly clothing.

2. Price and Income Elasticities of Demand.

Data are not available to estimate elasticities of demand. The income elasticity of food is probably very high. Price elasticities for major food items are likely to be relatively elastic since prices are based on high RSA levels.

3. Changing Patterns of Consumption.

The scant data available on consumption patterns do not reveal any drastic changes in food diet patterns. The Basotho lives primarily on a subsistence diet. Consumption in the rural areas thus varies with on-farm production. Urban diets are supplemented by imported foods (LASA, 1978).

4. Potential for Import Substitution.

a. Imported Commodities Produced Locally

This is a very real possibility for food items which can be grown competitively with the Republic and offered to local consumers during the entire year. There are several products which have potential. These are wheat, sorghum, maize, selected vegetables such as cabbage, potatoes, carrots, and meats. All of these must be offered to the consumer

at a price equal to or below the price offered by RSA. The quality of products coming from South Africa is excellent in most cases. It loses its freshness in the small markets because of the lack of refrigeration. The consumer in Lesotho is becoming accustomed to good quality imports and will demand higher quality from local farmers in the near future.

b. Prices of Imports vs. Domestic Production Costs.

There is evidence that production costs on a semi-commercial basis in Lesotho are greater than import prices during most years. An extremely favorable season, weatherwise, is required to enable the Basotho farmer to report a profit from production. This occurs something on the order of two out of five years. Of course this explains why marketing surpluses of most products are extremely small.

Some data on Lesotho, international prices and RSA prices are presented in (Lesotho BASP, 1978) for sorghum, wheat, peas, and maize. Lesotho prices of these major crops were closely tied to South African prices which tended to be considerably lower than international prices. Fragmentary evidence in Lesotho suggests that most food products could be delivered to Lesotho markets from RSA at prices considerably below costs of production in Lesotho. Relative costs are important, but possibly more important is the high yield variability observed in Lesotho. Quality of produce also is critical to a quality-conscious consumer in RSA.

D. POTENTIAL FOR EXPORTS

1. Existing Exports

a. Existing Trends

Livestock exports over the 1971-1976 period are shown in the IMF Report (Table 5, Recent Economic Developments). The values of livestock exports during the period have varied from 2 to 6.8 million rands per year. Wool and mohair make up the major share of export value.

Very little grain is exported from Lesotho. Some wheat is exported to the Republic but wheat flour is imported. The net importation of wheat products is positive during most years.

b. International Prices vs. Actual Domestic Production Costs.

Costs and returns estimates for beans, maize, sorghum and wheat were made for the Thaba Bosiu Rural Development Project by L. F. Bredemeier (1977). Fixed and variable costs are very low for the traditional crops using current technology. Of course, yields are not great enough to yield any appreciable marketing surplus. Yields could be increased by adding variable inputs but costs increased greatly. The cost:RSA price ratios are not very favorable for using added inputs to increase yields on dry-land farming. The real problem in this respect is the high variability in yields even with high levels of variable inputs and good management.

c. Distortions Created by Government Prices.

Lesotho has not as yet entered the market place and greatly affected prices and production. A case with bean and potato pricing was mentioned but the venture was largely unsuccessful. The problem was a limit of exports to RSA at going RSA prices. Local prices were set far too low for these products to serve as a price stabilizer. By in large, the area of pricing to affect production patterns has not been tried by the Lesotho Government.

d. Capability of Expanding Output at Undistorted Prices.

The possibility of affecting output in Lesotho depends much more on natural phenomena than any concerted effort by government. Most evidence indicates that traditional production technology is more profitable than much of the suggested improved methods. The reason for this is that

unit costs are low with the traditional methods. Therefore, losses are low when weather is unkind to the farmer. It will take a tremendous educational effort to convince farmers to increase variable input uses to increase yields when he is so aware of the potential losses due to weather and the possibility of having little or no market for the product. The Basotho farmer, even the subsistence farmer, is very rational in this respect.

## 2. Potential New Exports

### a. Perceived Barriers.

The economics of producing, transporting and marketing most products in Lesotho for the RSA market are not at all favorable. RSA has import quotas on red meats. Quality of most products is also a barrier in that the RSA market is highly developed and demands good and consistent quality.

The potential for new exports depends greatly on how quality and quantity of products can be offered to consumers in other countries, primarily the Republic. For meat products, the Republic may be reluctant to open its markets to Lesotho farmers. Consumers in RSA probably demand higher quality than what is profitable to produce by Basuto herdsmen. One possibility for exporting meat is in the form of hamburger meat sold in large quantities to mining areas of the Republic.

The market for wool and mohair already exists and could be expanded if quality is improved. These two products may have international markets.

Few opportunities are open to market cash-crop cereals because of the high costs of production, assembling and marketing. Quality is the other barrier to entry for most cereal crops.

Vegetables could possibly be marketed in the Republic if minimum quality can be obtained and a packing container is available. A crop like strawberries could possibly be marketed in countries outside RSA.

There is a possibility of selling specialty products such as canned asparagus in the Republic and maybe western Europe. However, the price of imported cans for processing will make this a very doubtful activity.

b. International Prices vs. Domestic Production Costs.

International prices are not very favorable relative to domestic production costs in Lesotho. The final blow is the high costs of assembling and transporting the product. Transportation is one important consideration for placing wool and mohair so high on the priority list of items with potential. They are light weight for transporting, easily handled and store well under normal atmospheric conditions.

E. DEMAND AND SUPPLY PROJECTIONS FOR LESOTHO.

1. Current Situation.

With exports averaging less than 10 percent of imports, it becomes meaningless to discuss supply and demand relationships in the conventional manner. In general, the relevant demand measures are those associated with the level of exports from abroad -- most from RSA (See Table 1). Thus the demand and supply relationships are those existing in RSA, not Lesotho. The very large level of imports from RSA are paid for, to the extent of some 70 percent, by the labor supplied by the Basotho worker -- not by agriculture or manufactured products produced in Lesotho. The remaining short-fall in the balance of trade is covered by revenues from the Customs Union Agreement and foreign aid. In summary, the supply and demand relationship are determined in South Africa, with prices externally determined for the people of Lesotho.

2. Projected Situation

Accurate projection of supply and demand relationships in Lesotho is impossible. The most relevant approach is to view the potential impact of a development scheme as outlined in the following section and indicate the potential for an increase in exports or a decrease in imports through substitution of locally produced goods and services. Additionally, the potential for increasing the level and quality of the local diet must be included in the evaluation. The analysis of the potential project will follow the presentation of the proposed plan.

Table 1. SUMMARY OF EXPORTS AND IMPORTS FOR 1976 IN LESOTHO  
IN THOUSAND RAND. (DATA FROM 1977 ANNUAL STATISTICAL  
BULLETIN.)

Commodity Group	Imports	Exports	Net Balance
Live Animals			
Live Cattle	1,080	192	-888
Sheep & Lambs	938	36	-902
Other Animals	409	21	-388
Food Stuffs			
Meat and Meat Products	2,756		-2,756
Milk and Cream	1,985		-1,985
Cereal and Related	15,987	1,789	-14,198
Bakery Goods	587		-587
Fruits and Vegetables	3,514		-3,514
Sugar	5,095		-5,095
Beverages & Tobacco	7,863		-7,863
Other Foodstuff	4,221		-4,221
Raw Material			
Wool		1,719	+1,719
Mohair		1,989	+1,989
Hides & Skins		455	+ 455
All Other Items	<u>141,680*</u>	<u>8,380</u>	<u>-133,300</u>
TOTAL	179,625	14,645	-164,980**

\*Large categories of other inputs include manufactured goods from materials R41, 824; machinery and transportation equipment R22,730; and misc. manufactured goods R45,128.

\*\*Earnings of Basotho working abroad is estimated for 1976 to be R102,200 to decrease the (net) negative trade balance. IMF, April 14, 1977 (p.4).

## VI. AN AGRICULTURAL DEVELOPMENT PLAN PROPOSAL

The following section presents a set of basic suppositions and hypotheses regarding the previously cited resource situations and policy variables. Considerable quantitative research is needed to test the validity of these suppositions and hypotheses. These presumptions will guide the development of the long-range strategy.

### A. BASIC SUPPOSITIONS AND HYPOTHESES UNDERLYING A LONG-RUN STRATEGY.

#### 1. General Economic Relationships Presumed.

- a. Economic well-being of the Basotho is greater than secondary data suggest.
- b. Economic aspirations and consumption expectations of the rural Basotho are low relative to those observed in most western countries, Korea and Japan.
- c. Natural resources except maybe labor, rangeland and water are very limited in terms of increased agricultural development and growth.
- d. Marketing systems are undeveloped with little natural inclination by the individual Basotho to become merchants and traders.
- e. Management capability of farmers is generally low.
- f. Energy resources in Lesotho are in critically short supply with the exception of hydroelectric potential which is, as yet, untapped.
- g. Current living standards are impossible without economic ties with RSA or air-lift aid from the international community.

- h. Current foreign aid levels are extremely high for effective absorption and cost effectiveness.
  - i. Aid from some donors has been capital infra-structure intensive rather than for creating social over-head capital. USAID has funded primarily technical and institution building projects.
  - j. Leakages associated with capital assistance aid are great, possibly as high as .8 or .9 to RSA primarily.
  - k. Multiplier effects in Lesotho of aid are low -- i.e., primary effects accrue to RSA and donor countries.
  - l. Returns to the crop and livestock sub-sectors account for only about 17 percent of rural household income.
  - m. More than 75 percent of the males of working age (20-39) are employed in RSA.
  - n. Only 12 percent of the males in the active labor force are available for full time agricultural employment. There is the potential for some additional male agricultural labor for migrants on home leave, (Seckler, 1978).
  - o. About 70 percent of all farm households are operated by women, but most decisions are made by the male migrant.
  - p. Lesotho currently imports about one-half of its food supply.
2. Political Reality Suppositions
- a. The government can utilize the threat of an economic boycott by RSA to generate political and economic support from the international community.
  - b. Institutional arrangements such as land tenure, role of women, family structure, etc., are more politically sensitive than long-run economic development.

- c. Political and economic options are restricted by RSA's institutional policies, e.g., labor, migration, marketing access, capital goods, custom unions, pricing of products, etc.
  - d. Legislation is possible at the central level, but enforcement at the local or district level, is not very reliable, i.e., enforcement is at the discretion of the chief and the prominent leader at the village level.
3. Social, Cultural and Family Relationships,
- a. The family is the central decision-making unit with the male clearly dominant in farm management.
  - b. Each member of the family unit has clearly assigned tasks.
    - (i) Male adult - Heavy tasks of plowing, cultivating and off-farm employment.
    - (ii) Female adult - House chores, weeding, harvesting, etc.
    - (iii) Male children - Livestock herdsman.
    - (iv) Female children - Light work, but a valuable asset for family long-run wealth and security (bohali or dowry).
  - c. Traditional customs and norms are deeply engrained in the Basotho.
  - d. Spirit of cooperation and charity exists within the family, i.e., no member of a family starves as a result of a poor crop as long as food can be provided by other family members. Cooperation and charity outside the family unit is an unknown dimension.
4. Technical Production Characteristics and Relationships.
- a. The present rather unique land tenure system will be continued with only minor modifications.

- b. The Basotho use livestock primarily as a status symbol and a stock of wealth.
- c. The yields of virtually all crops are low by international standards and have shown no marked improvements over the past several decades.
- d. The yields in family garden plots are reportedly much higher than those for field crops and could provide a large segment of the families' needs.
- e. Soil in Lesotho is susceptible to severe erosion and much of the nation's land has been subjected to devastating sheet and gully erosion.
- f. Although the nation has an abundance of water, it is subject to extreme fluctuations and its potential use for hydroelectric power and irrigation is severely limited by the high level of silt in the water.
- g. Hail storms are a common occurrence and often cause wide devastation to crops.
- h. Water in underground aquifers is widely available, but the storage capacity of the aquifers is thought to be very limited and probably insufficient for irrigation on any appreciable scale.
- i. Virtually every large scale land and water project in the past has been less-than-successful because water was not the constraining factor. Sufficient capital was not available for the duration -- including operation and maintenance -- of the project, institutions and personnel to manage the project in the long run was lacking, and technology introduced was not compatible with the cultures and values of the Basotho (LASA, 1978).

B. THE PROPOSED STRATEGY.

The following is proposed as a long range development plan for increasing the effective use of the Lesotho nations' land, water, and human resources. The guiding principles used in preparing this integrated plan specifically include the potential efficiency -- equity trade-offs of proposed actions and the development of an overall cost effective program. The production alternatives suggested are thought to be those in which the natural and human resources of Lesotho possess a comparative advantage, as constrained by the need to upgrade human skills and protect the nation's land and water resources. The plan is specifically designed as a long-run program rather than a short run (3-5 years) project approach, within the context that specific projects will be integrated parts of the overall program. The plan would require a sequential approach in its development.

There are eight interrelated elements in the proposed plan for development of Lesotho's agricultural sector:

1. A decrease in acreage of crops and a corresponding increase in forage and fodder production for winter grazing on marginal quality land.
2. Restrict the production of cash crops to the more productive soils (mainly in the foothills area) with emphasis on increased management competencies, higher valued crops, limited irrigation and minor modifications to tenure arrangements.
3. A gradual increase in the quality of the livestock sector with specific consideration of the efficiency-equity question as related to livestock holdings and between crop and livestock producers.

4. Intensive development of one to two acre garden plots to increase the quantity of home grown foodstuffs and to employ labor released from the decrease in food crops production.
5. Development of small surface water impoundments or wells for domestic and livestock water supplies and supplemental irrigation for garden plots.
6. Increase the availability of closely related employment opportunities -- especially agri-business, arts and crafts -- to utilize under-employed labor and provide markets for high valued crops.
7. Develop a pilot program for determining the feasibility of establishing economically viable fishing and forestry sub-sectors.
8. Investigate the potential impact and political feasibility of taxation and transfer schemes to raise revenues and to help guide development toward desired goals.

C. IMPLICATIONS OF THE PROPOSED PLAN.

Element 1: Marginal Land to Grasses

The first element in the plan would be the identification of the more erodible and marginally productive soils now producing cash and food crops in each village or district. The procedure here would be essentially the same as that used in development of the Thaba Bosiu Project. These marginal lands would be removed from crop production on a gradual basis and planted to forages and fodder for winter feeding of livestock. Soil conservation practices, again similar to that being undertaken in the Thaba Bosiu Project, would need to be employed. To insure that an unacceptable "stock" to the local economies did not occur in the short run, it is necessary to estimate the change in food and income availability due to this change in production practices. Once these estimates are made, alternative methods would need to be considered

for providing at least the short run subsistence needs of the villages which result from the decrease in cropland.

Specific knowledge requirements, would include an evaluation of current transportation and marketing facilities to assure adequate, or at least current, levels of food stuffs are available at the village level during the early stages of plan implementation.

Element 2: Increase in Intensive Crop Production

Assuming the first objective of decreasing crop acreage on marginal land begins moving forward, the potential for increasing cash crop production on the better soils should be investigated. Four alternative activities, complementary in nature, are potentially feasible to increase production. An extension-informational program will be needed, with emphasis on the more progressive rural residents who really wish to be farmers, to demonstrate that farming can be an income producing activity rather than for subsistence production only. This of course requires the necessary support service for buying and transporting the farmers' product and providing production inputs. Current programs such as Basic Agricultural Services Project BASP and Produce Marketing Corporation PMC would be useful adjuncts to an overall program of cash crop production. Minor modification of the land tenure system, either through share cropping which is now practiced, or cash rental, which in the early experimental stage would greatly facilitate the implementation of this portion of the plan. Two additional, and somewhat controversial aspects of the plan, would be to re-orient production toward higher value crops and supply supplemental irrigation systems. There are some inroads being made in moving to higher valued crops -- beans, asparagus, cabbage, etc., -- on

a very limited scale. However, the assurance of a whole production to marketing continuum of activities is necessary for profitable production of these crops. Thus, the plan suggests a continued exploration of the economic feasibility of truck crop production. Available data suggest that a limited market is available, both as exports and as import substitution for local consumption, for these more intensively grown cash crops.

There are major disagreements between various experts on the potential for widespread irrigation with Lesotho. The weight of evidence seems to suggest there should be only limited emphasis on massive irrigation schemes. Silting, dam site locations, stream fluctuations and high level management requirements are all major obstacles to implementing large irrigation schemes. It should be noted, however, that the rumored development of the massive hydroelectric power scheme (main objective is water supply to South Africa) would provide a valuable source of irrigation water to Lesotho. Excepting that possibility, our plan recommends only limited emphasis on irrigation with major emphasis on the small scale, village level schemes.

Element 3: Changes in Livestock and Livestock Mix

In conjunction with the development of the cropping plans discussed above, the plan also calls for changes in the livestock sub-sector as more forage and fodder becomes available at the village level. The emphasis here should be on a program which stress the quality rather than the quantity of livestock. It is recognized, of course, that livestock provide the dual function of production goods and as storehouses of wealth. However, cattle are currently being marketed and extension programs should be developed in an attempt to stress the productive

aspects of the livestock economy. Improved breeding programs are indeed difficult with communal grazing systems, but economic incentives in the form of higher prices for better quality beef and castration of "scrub" bulls would be a start toward higher quality beef herds.

While recognizing the cultural constraint to reducing the number of cattle, a program to change the livestock mix should be undertaken. The major component of the program would be to increase the number of sheep and goats with a reduction in cattle numbers. This would provide for better utilization of the summer and winter pastures. In addition, there is a ready market for wool and mohair, and in fact, there is an infant industry for processing these products into textiles and finished products. Also, transportation of wool and mohair is much less costly than freshly processed beef.

The potential for increasing the relative number of dairy cattle needs to be examined. The greatest potential would seem to be for introduction of dual purpose cattle such as milking shorthorn or Brown Swiss. The milk and its by-products would be mostly for home consumption and thus increase the protein available to rural residents and provide for significant reductions in milk and milk product imports.

Specific knowledge requirements for implementing this change in the nation's livestock program include:

1. The potential carrying capacity of the summer and winter pastures for different livestock mixes.
2. The breeds of livestock most adaptable to the climate and grazing conditions.
3. The carrying capacity of the summer mountain pastures and the potential for rotational grazing in selected mountain areas.

Element 4: Gardens and Poultry

Element four (4) of the plan would be to emphasize an increase in the use of garden plots to decrease the impact of the reduction in production of the more extensively grown maize and sorghum as well as, potentially at least, increase the variety and nutritive balance of foods in the Basotho diet. The more intensive production practices in the garden plots would also use some of the labor released from the decrease in extensively grown crops.

Specific questions that need to be addressed are the increase in food supply that one might expect from increased gardening, the Basotho's willingness to change their work habits and the acceptability of the foods produced in the garden. Specifically, a "food balance" should be computed based on the decrease in extensively grown crops and the increase in cash crops and in garden plots.<sup>1/</sup> Likewise, a "labor supply" balance needs to be estimated to determine the amount of under-employed labor available for other activities. An assumption in each of the above three elements is that young people, primarily boys, will be available to herd the livestock and restrain the animals from ruining the newly established pastures and gardens. Thus, the current system of communal grazing would need to be adjusted to protect these areas. There is some evidence however, that the tenure system does permit some "set aside" for emergencies. Thus the protection of gardens and immature forage may be compatible with the tenure patterns determined by local chieftains.

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<sup>1/</sup>The expected impact of the proposed strategy would be a significant reduction of agricultural production over the short-run (3 to 5 years), but the shift to higher valued crops should offset declines in farm incomes over the longer run. Diets should be improved nutritionally by the increase in production of truck crops for home consumption. Food imports of many crops would be reduced, but imports of feed crops may increase. PL 480 assistance could provide short-run relief from the shock of output reduction.

A specific knowledge requirement is a better understanding of the basic equity question as it relates to the crops and livestock producers when they are not in fact, the same farmer. Scattered evidence suggest that the livestock producer is in the preferred position at the expense of the crop producer. The implication of a change in the crop-livestock mix will require an evaluation of the potential change in the equity position of the two types of farmers.

Element 5: Small Irrigation and Domestic Water Supplies

A fifth element of the plan is the more effective use of the nation's water resources. There seems to be ample evidence that: (1) the nation has an abundance of water available, but its availability is subject to wide variations; and (2) that the erosion problems cause the water to carry extremely heavy loads of sediment. (Reports indicate that irrigation pumps need to be replaced every two years because of damage from sediment in the water.) Thus this plan recommends the development of small surface water impoundments and/or underground supplies. Even though the accomplishment of this plan's objectives should cause major decreases in the level of sediment by putting the more marginal land in permanent pasture, the sediment problem will no doubt continue to plague the large, mechanized irrigation schemes.

To be considered first is the development of small, and relatively inexpensive earthen dams in those villages near streams or rivers. The increased costs and diseconomies of size associated with small versus large dams would tend to be offset by the decrease in transmission costs. The availability of a year-around water supply would support the proposed livestock plans. Additionally, and perhaps more importantly, is the use

of the impounded water for irrigation of garden plots. In this case, the very simple irrigation system could be developed. The potential for animal or even human power for these small irrigation systems needs to be examined. Again the emphasis is on a small and relatively simple method which works rather than the larger more complex system that, evidence suggests, does not work.

Data available suggest the widespread availability of good quality underground water supplies. Previous studies have indicated these aquifers are limited in size, but their potential for use at the village level with relatively low consumptive use demands may prove that underground sources of water are sufficient in many areas of Lesotho.

An activity which should be examined for its potential complementarity with the less cash crop and larger gardens is the introduction of "family flocks" of poultry. Poultry in general is a very efficient feed to food converter and has the extra advantage of increasing the level of protein in the Basotho diet. Family flocks of 20 to 100 chickens, although in general disfavor in the highly mechanized U.S., would be a valuable source of eggs and meat at the village level if disease control is possible. The effectiveness of this type of poultry enterprise, plus an evaluation of the acceptability of a poultry enterprise needs to be undertaken.

An increase in the very small number of swine should also be considered. Here again, the emphasis would be on swine as a complementary activity to garden and poultry production at the family or, at most, village level. Specifically, swine production would be viewed as a supplement to current subsistence returns rather than as commercial enterprises.

Element 6: Agri-Business and Arts and Crafts

The sixth element in the plan is the development of related activities such as agri-business and arts and crafts. Although this would tend to be the "cottage type" industry, the potential for success would be higher if these types of activities could be carried on at a higher level of aggregation -- perhaps at least at the level of several villages. The magnitude of this activity would depend, to a large extent on the findings of the labor supply balance determined in element three of the plan. A special need also would be to examine the potential marketing outlets, the transportation of labor between villages, and the general acceptance of cottage type industry to the rural resident.

Regarding agri-business, there exists an opportunity to process the cereal products to flour and breads. The infra-structure would not be too great to store and process feed grains to feeds for livestock. Processing livestock should be examined very closely because of the inadequate facilities which exist in the country to store. Central refrigeration units may be possible if power sources are readily available. Vegetable and fruit processing may be possible in consumer kitchens but commercial processing of these products is doubtful because of the need to import expensive containers. Education of the housewife would be necessary for introducing home canning of most agricultural products.

Arts and crafts offer considerable opportunity on a limited scale if tourist traffic expands. These ventures should probably be based on the raw products of wool and mohair.

Element 7: Fisheries and Forestry Development

The seventh element of the plan is concerned with the fish and forestry sector as complementary activities in the development of Lesotho's resources. The stocking of the small water structures would provide a nutritious supplement to the local diet as well as provide limited potential for export. Although current technology for export is extremely expensive (transport in tanks and sell as live fish), the potential for developing a small export market seems feasible. Additionally, the Basothos have developed a taste for fish and it is in high demand in the local market. Thus, a viable fishing sector could provide an attractive complementary activity.

The development of a forestry sector, with special emphasis on its use as an energy source needs additional exploration. Current field trials indicate the potential for adapting several fast growing species, e.g., pine. The development of a lumbering component to the forestry sector seems very remote, but it again would be a valuable complementary activity.

Element 8: Taxation Schemes

The eighth and final element of the plan is perhaps the most controversial. The Plan suggests the imposition of a taxation scheme to help insure the short and long range viability of the overall plan. Specifically a tax system with two components is suggested. First, a relatively low tax on the migrant workers' wages sent to Lesotho banks by the South African firms. Second, a livestock head tax which would tend to encourage more selective breeding, reduction in stock, etc. Note that each of these taxes would tend to be progressive in that the taxes would be higher for the more wealthy Basotho. The funds derived from these sources should be ear-marked funds used only to implement the overall rural development plan.

A budget needs to be prepared which compares the income of rural residents under the present farming system and that under this soil and water management plan. The decrease in income caused by the plan's implementation would be reimbursed from a fund built up by a small tax on migrant income. In general, the rationale for this approach is that the current migrant workers are making a contribution to the reclamation of the nation's land and water resources. It may be possible, under changing tenure arrangements, to assure the returning migrant laborer a place in the rural areas as a partial return for his tax expenditure, i.e., a system of forced savings which is used to improve the nation's natural resources.

A second proposed tax would be a head tax on animals. This would have several potential advantages: (1) it would tend to encourage higher quality stock since the tax rate on an improved animal would be the same as on the scrub; and (2) a differential tax rate could be used to help reach the desired livestock mix of cattle, goats, etc. Again, the revenue from this program should be earmarked to improve the livestock through breeding and management programs.

D. EFFECTS OF IMPLEMENTATION OF THE PROPOSED PLAN.

One can only speculate about the effects the proposed plan might have on the development of the agricultural sector. It is possible to indicate the general direction or tendency which the sector might take over in the long-run. One would expect a general increase in importance of the livestock sub-sector in Lesotho. In the short run, the level of imports of live cattle would remain approximately the same as high quality breeding animals are introduced. The export level should also remain at

approximately the same level or increase slightly as the worst of the scrub cattle are culled from the herd. In the longer run, there should be a major drop in the negative net balance of trade for cattle as the herds within Lesotho are improved. Almost an identical scenario would be appropriate for projected changes in sheep and lambs, and poultry products.

The export and import relationships for foodstuffs should move towards a decrease in the large negative balance of trade. A decrease in imports of meat and meat products should result from the increase in the livestock sub-sector and the development of an abattoir to reduce the dependence on South African meat and meat products. The magnitude of the decrease in imports will depend on: (1) improvements in the local livestock sector; (2) the availability of an abattoir and a distribution system; and (3) changes in the per capita consumption of meat which is now only two-thirds of recommended levels.

A decrease in the imports of milk and cream can be expected if the improved livestock sector includes the introduction of milking shorthorn or Brown Swiss type animals. In addition to the possibility of import substitution, the current consumption is only 60 percent of recommended levels. Supply increases would be divided between increased consumption and import substitution.

The largest single negative balance for foodstuffs is due to the very high importation of cereal and related grains. A reduction in crops may make the situation even worse. However the magnitude of the problem may be lessened by a change in consumption patterns. If more meat is available and a higher variety of products is being produced in the home

garden, the heavy emphasis on maize and wheat may decrease. This would have the advantage of a decrease in the heavy dependence on coarse grain in the diet which is estimated to be 150 percent of the recommended levels.

The potential for decreasing the heavy emphasis on imports of other foodstuffs seems remote. Any progress made in these areas will probably be offset by the rapid rate of population growth in the nation.

In summary, the projected demand and supply situation can only realistically be viewed as a continuation of the heavy dependence on RSA for imports with payments made by the migrant worker. Although one may wish otherwise, the continued reliance on RSA will probably continue for the next several decades, unless political forces of either country make unilateral decisions which are basically unrelated to economic supply and demand forces. The proposed plan may seem radical, but it is designed to gradually move the rural economy toward a system which (1) protects and improves its valuable national resources, (2) emphasizes the type of activity -- livestock -- that seems to fit the basic resource base, and (3) provides a long-range scheme to finance the plan by the Basotho rather than foreign assistance. Short-term assistance to start implementing the plan will be required and is discussed in the following section.

It should again be emphasized that the plan requires an integrated approach to development of the agricultural sector. The various elements in the plan are complementary activities and each component is inter-related with every other component. Major emphasis on one element, while neglecting others will virtually insure defeat of the entire plan. This does not mean, however, that the entire country needs to be remolded within

the lifetime of one short range project. The objective here was to develop a long range strategy within which various project "pieces" would make a contribution. It is also suggested that a pilot approach will be needed to test the feasibility of various elements in the plan. If unsurmountable obstacles are encountered, alternative programs which use different means but have similar ends, would need to be substituted in the plan.

Finally, it should be noted that gradual changes that tend to respect the cultural values of the Basuto people are recommended. Massive schemes to change agricultural production techniques seem destined to fail. The gradual movement from subsistence to subsistence with a better diet and some cash income seems much more feasible and compatible with the local culture and resources available.

E. DOMESTIC AND FOREIGN AID POLICIES FOR PLAN IMPLEMENTATION.

Major components of foreign assistance programs need to be geared to each of the eight elements of our basic plan. In general we suggest no major new efforts, but place emphasis on the continuation and improvement of those previous and current activities. The general guiding principles should be: (1) to provide aid only at the level of the absorptive capacity of the local institutions and people; and (2) more emphasis on long-range projects which include adequate funds for operation and maintenance of projects and provision for training of local residents to continue project activities.

Although the following is an element by element discussion of donor needs, we would again emphasize the inter-relatedness of the various elements and the need for activity on all elements of the plan.

Element 1: Marginal Land to Grasses

The major assistance objective should be the continuation of the comprehensive soil conservation planning approach being used in the Thaba Bosiu Project. Continuation of this work, with emphasis on the extension function to encourage higher level management is a prime requirement for completion of this pilot effort and the transfer of knowledge acquired in this project to other dryland regions of the nation.

Element 2: Increase of Intensive Crop Production

As in element one, many of the successes in the Thaba Bosiu Project should be continued and expanded to other regions with good soils. It is also important that the activities of BASP and PMC be coordinated with this activity to insure an adequate supply of production inputs and market outlets. There does not appear to be any need for major new projects. The emphasis should be on programs of technical assistance, training, extension-type activities and management schemes that insure adequate coordination of at least a skeleton marketing system for agricultural inputs and outputs.

Element 3: Changes in Livestock and Livestock Mix

The major constraints to long-term increased production of livestock appear to be: (1) current overstocking and (2) low-level livestock management. Overstocking of grazing land has resulted in overgrazing with subsequent loss of forage, ground cover and climatic vegetation. As a result, massive amounts of land area have been and are eroding and inferior species of vegetation are present. Training and information dissemination is needed in this area.

An effective extension service should be re-vitalized to increase the level of livestock management and explain to the village leaders and people the benefits of the program. Further analysis of the livestock subsector is presented in Appendix 2.

Donor assistance is needed in the educational area to assist the government in making the hard decision to reduce cattle numbers. Capital investments in elementary marketing facilities may be required.

Element 4: Gardens and Poultry

Donor assistance programs should be designed to provide small scale production inputs for production of home gardens. A program to provide seeds and other production inputs as well as extension information on production techniques and in the area of home economics is needed. Also the availability, at the village level, of a rotor-tiller or perhaps a simpler device for ground preparation would be a useful project. Coordination with BASP on provision of these machines and needed repair parts, plus availability of an expanded PMC would be needed to make the project effective.

A subsidized system of providing the starting nucleus of a farm poultry flock would seem to be a cost-effective program. It would be important to provide information on poultry production and disease control (especially Newcastle) with the main emphasis on the health and continuity of the flocks rather than attempting to attain maximum production levels.

Element 5: Small Irrigation and Domestic Water Supplies

The comprehensive study by Metcalf and Eddy (1977) has reviewed the potential for providing domestic water to the individual villages. Although not necessarily endorsing that report, it will be necessary to

build on this work in an attempt to provide water supplies for domestic use as well as for livestock and supplemental irrigation for the gardens.

An active self-help program for supplying village water supplies is in place and should be encouraged. Direct donor assistance, in the form of education and new technologies, would be valuable in assuring long-run viability of the system -- a current major problem. Specifically the potential for small scale solar and wind powered equipment needs to be evaluated and perhaps implemented on a pilot basis.

The development of small earthen dams for village storage of water would seem to be a useful undertaking in areas where adequate surface water is available. However, we suggest these impoundments should be an integral part of the overall comprehensive soil conservation plan rather than a specific project.

Element 6: Agri-Business and Arts and Crafts

Substantial work is already being undertaken in this area, and specific donor programs should be designed to support the current on-going programs and develop new initiatives only when it can be shown that there is a specific need. For example, the current effort toward first-level processing of crops and animals should be encouraged. Programs which tend to decrease the direct leakage of donor funds to firms outside Lesotho are to be encouraged. But again we emphasize the need is to follow through on the current efforts, rather than the development of new schemes.

Element 7: Fisheries and Forestry Development

The major donor projects would be more in the area of information, training and market development in both sectors. Technical advice on fish species, especially as it relates to differences in seasonal production

technologies is an important need. Alternative marketing systems for exporting fish and fish products need to be explored with potential for coordination with the PMC activities.

Similar information and institutional building programs are needed to support an expanded forestry sector. Additionally, the potential of processing facilities for the production of charcoal and lumber, and potentially even pulp and paper production, needs to be further investigated to determine economic feasibility.

Element 8: Taxation Schemes

Obviously, the focus of activities for this element of the plan is the requirement of highly expert technical assistance in the area of taxation and expenditures. The sensitive nature of this activity would require a low profile on the part of any foreign donor if this element of the plan is implemented.

## VII. SUMMARY AND CONCLUSIONS

The critical short-run situation of overgrazing crops, using marginal lands for crop production and providing little incentive to increase production or marketing surplus has led to serious long-run problems which need immediate attention by the government of Lesotho and long-range technical assistance from abroad. In addition to the above, the natural and human resource base is very limited in terms of any possible real growth of the agricultural sector even if resources can be allocated optimally in the short-run and long-run. There is evidence that capital resources are in short supply but it is highly unlikely that capital is the limiting resource restraining growth of the agricultural sector. Far more restrictive are land, water and technical knowledge coupled with the need for some institutional changes which would provide more economic incentives to increase production, income and the accumulation of wealth.

The plan as presented in this report took into consideration the current short-run situation but pertains to a long-run strategy designed to optimally utilize the limited resources available. It assumed continued economic ties with RSA regarding trade and labor employment. The plan is still sound even if the border with RSA is completely closed and migrants return to Lesotho. It is unlikely, however, that agricultural output would increase much if at all with the additional labor but the total "pie" would be divided by many more people.<sup>2/</sup> The variety and volume of consumer

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<sup>2/</sup> Agricultural productivity would probably be affected only marginally if laborers were forced to return from RSA. Limited local demands would force prices to drop sharply, and similarly total and net revenues will fall considerably.

items on the retail shelves would decline sharply. Food prices would likely increase drastically unless price controls were instituted. The "black" market would then thrive.

Economic cooperation is mutually advantageous to both Lesotho and RSA. If this is a valid assumption, the foreign assistance package should be designed to promote development in Lesotho. The highest pay-off of an aid package should be to alleviate the major constraints to better resource utilization and a more profitable product mix. This appears to be a technical assistance package designed at improving the human resource and related institutions. This is a long-run task requiring funding only at a level equal to the absorptive capacity of current human capital but over a time horizon sufficient to accomplish the task. Development of human capital will require some physical capital improvements but "brick and mortar" projects with their high leakage characteristics will not likely have a very high pay-off in improving the welfare of the Basuto. <sup>3/</sup>

These strategy elements were discussed with Lesotho officials who were in the country during the time of the field work for this sector assessment (middle level ministry people in the soil and water conservation division, livestock division, agricultural planning office), as well as Colorado State University staff and USAID representatives. They agreed with the over-all plan but were concerned with land reform and tax aspects of the plan. They did not question the desirability but the operational feasibility of forced land retirement from crops and the forced cattle reduction. The latter is an absolute must under any development plan.

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<sup>3/</sup> See Appendix 3 for an assessment of training inputs required to support the proposed eight elements of strategy.

References

- Bawden, M. and D. Carroll. 1968. The Land Resources of Lesotho, Directorate of Overseas Surveys, London, England.
- Biggs, H. C. 1964. Report on the Marketing of Agricultural and Livestock Produce in Basutoland, Maseru, Lesotho.
- Bredemeier, Lorenz F. 1977. Three Year Research Report of Thaba Bosiu Rural Development Project -- Ministry of Agriculture, Government of Lesotho, 1974-1977, Maseru.
- Cowen, Denis V. 1967. "Land Tenure and Economic Development in Lesotho." The South African Journal of Economics, Volume 35, No. 1, Pretoria.
- Douglas, A. J. A. and R. K. Tennant. (1952). Basutoland: Agricultural Surveys 1940-1950, Maseru, Government Printers.
- Farah, Abdulrahim Abby, et.al. 1977. Farah Mission Report, United Nations General Assembly Security Council, A/32/323. S/12438, New York and Maseru. Lesotho.
- Gay, J. and T. Guma. 1978. "Altitude Survey of Sengo Project Area Farmers, FAO And Bureau of Statistics, Maseru, Lesotho.
- Halpen, J. 1977. "Lesotho." Africa South of the Sahara, 1977-78, Gale Research Co., Detroit, 1977.
- Jenness, J. 1977. "Report on Households, Land Use, Crop Production and Incomes," Economic Survey No. 1, Thaba-Tseka Mountain Development Project, Ministry of Agriculture and Canadian Government, Maseru, Lesotho.
- Jilbert, John. 1978. "Population Trends in Lesotho." Consultants Report to LASA Project, Roma.
- Legune, Calin (1977). Africa Contemporary Record: Annual Survey and Documents, 1976-77. African Publishing Co., New York.
- Metcalf and Eddy. 1977. Lesotho Rural Water Supply Report, USAID and Government of Lesotho, Metcalf and Eddy International, Inc., South Staniford Street, Boston, Massachusetts.
- Moody, Elize. (1975). Growth Centres in Lesotho. African Institute of South Africa, Pretoria.
- Seckler, D.W. and K.C. Nobe, 1978. A Reconnaissance Level Evaluation of Soil Conservation Programs and Methods in the Kingdom of Lesotho, Unpublished Report, Colorado State University and USAID, Fort Collins and Washington.

References (continued)

- Sturgeon, R. M. and C. P. Makara. 1975. Marketing and Credit Report. Technical Document #8, NGS:SF/Les 2, FAO and UNDP, Leribe, Lesotho.
- Turner, Stephen D. 1978. "Lesotho Farming: The condition and prospects of agriculture in the lowlands and foothills of Lesotho. Ph.D. thesis, School of Oriental and African Studies, University of London.
- Van der Wiel, A. C. A. 1977. Migratory Wage Labor -- Its Rate in the Economy of Lesotho, P.O. Mazenod, Lesotho.
- Williams, John C. 1972. Lesotho: Land Tenure and Economic Development Communications, No. 19, The African Institute, Pretoria.
- \_\_\_\_\_. 1978. Annual Statistical Bulletin. 1977. Bureau of Statistics, Maseru, Lesotho.
- \_\_\_\_\_. 1978. Draft Proposal for Lesotho Agricultural Sector Analysis. "Scope of Work." LASA Team, Colorado State University and Ministry of Agriculture, Maseru.
- \_\_\_\_\_. 1975-76. Kingdom of Lesotho Second Five-Year Development Plan, Volume 1 and 2, Government of Lesotho, Maseru.
- \_\_\_\_\_. 1975. Lesotho: A Development Challenge. World Bank Report, Washington, D.C.
- \_\_\_\_\_. 1978. Lesotho: Appraisal of the Basic Agricultural Services Project, Report No. 1524a-L80, World Bank, Washington, D.C.
- \_\_\_\_\_. 1976. Co-ops and Marketing, 1975 Annual Report, Coop. Division, Ministry of Agriculture, Lesotho.
- \_\_\_\_\_. 1977. Lesotho -- Recent Economic Developments, Unpublished International Monetary Fund Report, Washington, D.C.
- \_\_\_\_\_. 1978. Lesotho's Agriculture: A Review of Existing Information, Preliminary Draft Paper No. 2, LASA, Colorado State University and Ministry of Agriculture, Maseru.
- \_\_\_\_\_. 1977. Mobilization of Domestic Resources, Central Planning and Development Office, Kingdom of Lesotho -- Donor Conference Papers, Maseru.
- \_\_\_\_\_. 1977. Reconnaissance Study to Plan for Internal Use of Lesotho's Water Resources, SWECO, 6 Volumes, Stockholm and Maseru: Swedish Consulting Group.

## Appendix 1

### TRANSPORT AND STORAGE INPUTS, LESOTHO

As currently experienced, costs of transport and storage in the lowlands run approximately R.01 to R.02 per kg, and thus with varying values of a kilo, the percentage of the wholesale price which is taken up with these costs ranges from a low of 2 percent on wheat to a high of 20 percent on fertilizer. In the mountains the costs rise dramatically to R.04 or R.06 per kg, averaging the varying distances between origins and destinations with more than two-thirds of this cost being transport and the remainder storage. There the fraction of wholesale price associated with transport and storage in the rural areas may range between a quarter and a third of the wholesale price depending upon commodity. Some high value commodities such as mohair, however, may be transported out of the mountains for less than 10 percent of the wholesale costs.

It may be concluded, therefore, that the role of transport facilitates the access to markets, but for those farmers presently served by accessible roads or tracks, the opportunity for stimulating production through lowered transport cost is not great except in the mountain areas. The latter are not crop producing areas, and wool and mohair can presently be transported with high but competitive transport costs.

#### I. Availability of Motorized Transport to Different Areas of Lesotho

A dearth of roads accessible to motorized transport was highlighted in the report of the UN Mission to Lesotho (1977). "Development of the whole basic road network is urgently needed both to give access at least to all

district headquarters and also to open up the country for agriculture, livestock and other development."<sup>1/</sup> Most of the lowlands have adequate main roads, but feeder roads are needed. The national network of main roads is largely incomplete in the mountainous areas, which constitute approximately two thirds of the area of Lesotho.

Multinational aid projects are planned to develop a national grid throughout most of the main links in the mountains. These may be expected to be completed within five years. In the same amount of time the majority of needed feeder roads in the lowlands will have been constructed under the BASP program. A considerable fraction of the mountain areas will still remain inaccessible to motorized transport unless a program of feeder roads is started in the high areas. Currently medical supplies are airlifted into the most remote areas through private philanthropy.

Private transport operators function in sufficient numbers in Lesotho to provide transport services to the lowland and foothill areas. In addition marketing operations such as PMC and Coop Lesotho own fleets of trucks which are used to transport produce. In the mountain areas "roads" threaten to immobilize even heavy duty trucks, and the risks of vehicle collapse are great. A run of 25 kilometers may cost R 180 in places where damage to vehicles is likely. Livestock are herded rather than trucked, with attendant weight losses. Animals are used to transport commodity in the active internal markets within the mountains.

## II. Condition of Road Linkage Between Rural Areas and Wholesale/Retail Markets

Map I shows in red the areas of main roads in Lesotho. Green roads indicate the proposed main road links scheduled to be completed with donor

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<sup>1/</sup>United Nations Security Council, Report of the Mission to Lesotho, March 30, 1977, p. 20.

support. Broken blue lines indicate needed road links not yet contemplated.<sup>2/</sup> There are approximately 2,300 kilometers of roads in Lesotho of which about 10 percent are bituminized. Projects to enlarge the road network are anticipated to add another 500 kilometers to the main road network.<sup>3/</sup> Costs of construction in mountain areas may average R95,000 per kilometer to bring a road up to a low level gravel standard. These costs must be borne for the most part by foreign donors. The cost of a 257 km road in the South has been underwritten by USAID, and additionally, about 1,000 km of agricultural roads are to be built under BASP.<sup>4/</sup> These feeder roads in the lowlands and foothills may be constructed for less than R 10,000 per km. The areas of BASP are shown as the diagonal striped section.

### III. Road Maintenance Capability

The Kingdom of Lesotho does not have sufficient capacity for road maintenance of existing stock, and with the expected increase in road building a severe strain will be placed on existing facilities. Responsibility for road maintenance is shared between the Ministry of Works, the Ministry of Agriculture, and the Ministry of Rural Development. All agencies complained of inadequate equipment, the dearth of trained manpower and inadequate financing. It is predicted that large portions of the road network will deteriorate unless donors continue to underwrite the costs of road maintenance. No fiscal mechanism currently exists to earmark vehicle or gasoline tax revenues for road repair purposes.

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<sup>2/</sup>The latter suggestions grew out of discussions with officials in the Ministry of Planning and the Ministry of Agriculture.

<sup>3/</sup>Kingdom of Lesotho, Donor Conference Papers, September 1977, pp. EI-3-4.

<sup>4/</sup>International Development Association, Lesotho: Basic Agricultural Services Project, April 17, 1978, p. 11.

IV. Types and Frequency of Use of Store Facilities

New investments in storage facilities for PMC and Coop Lesotho provide a road network of storage within reach of the majority of Lesotho's farmers. Map I shows the location of stores. Some constraints in storage were mentioned by livestock specialists. Good rail service into Lesotho from the Republic of South Africa obviates the need for additional storage capacity.

V. Suggestions for USAID Involvement in Capacity Building

USAID should focus on enlargement of training facilities for equipment operators, road engineers and surveyors. Also needed are mechanical services to repair equipment, and a ready supply of spare parts. It was noted by some observers that tied aid forced Lesotho to purchase road construction equipment incompatible with the demanding terrain of the country. An institute to test the appropriateness of donated technology could prevent costly delays in rebuilding equipment which fails to meet the demands of the environment.

Appendix 2

AN ANALYSIS OF THE LIVESTOCK SUB-SECTOR, LESOTHO

I. DESCRIPTION OF PRESENT LIVESTOCK SITUATION

A. Cultural

The people of Lesotho (the Bosocho) raise livestock for mixed reasons. In addition to economic incentives, livestock, especially cattle and to some extent sheep and goats are accumulated for cultural reasons. Generally speaking, these livestock are a form of security or a store of wealth. Therefore, the Bosocho do not respond to normal supply-demand relationships as the typical western livestock producer would. This is not to say that they do not respond to economic incentives but rather that their response is heavily influenced by the aforementioned social-cultural traditions. Any modification of the present livestock industry must recognize and include places for dealing with these cultural influences.

B. Economic

It was estimated (LASA, 1978) that for 1970, 60-70 percent of national export revenues came from the sale of livestock and livestock products. Presently, wool and mohair exports represent a major part of total exports. For 1977, wool and mohair exports which were reported represented 37 percent of total exports (Lesotho Bureau of Statistics Annual Bulletin, 1977). The Livestock Division of the Lesotho Ministry of Agriculture estimates that 50 percent of the wool and mohair are illegally smuggled across border, primarily to escape export fees and delayed payments. If the smuggling estimates are correct, wool and mohair represented 54 percent of total exports in 1977.

Another important consideration is the annual out-of-pocket costs for livestock vs. crops. Guma and Mofoso (1976) estimated net returns of R 61 to livestock owning households while out-of-pocket costs averaged R 21 annually. Relative to crop production, livestock husbandry (i.e., grazing stock), according to the LASA report, appears to be less risky, requires less operating capital, and in most instances offers a higher payoff in terms of net return to family labor.

## II. MAJOR CONSTRAINTS TO LONG-TERM INCREASED PRODUCTION

The major constraints to long-term increased livestock production appear to be overstocking and poor animal management techniques. Overstocking is, at present, a serious threat to future agricultural productivity in Lesotho. In 1976, there were 1,128,000 sheep, 618,000 goats and 486,000 cattle in Lesotho. From the standpoint of total grazing livestock (sheep, goats, cattle, horses, mules and donkeys) there are 1.03 hectares of grazing land in the highlands per head of grazing livestock. This is an extremely high stocking rate. As a result of these high stocking rates, overgrazing with subsequent loss of forage ground-cover has occurred. Concurrent with loss of ground-cover has been serious erosion of massive amounts of land area. Another effect of overgrazing is a change in vegetation. At the present time, it appears that grazing land in Lesotho on the average has 20-30 percent of the climate vegetation which is possible here. Unless drastic steps are taken to reduce stocking rates, the agricultural future of Lesotho will progressively dwindle until the resource value of the land will be extremely low.

In addition to reducing stocking rates, production efficiency can be improved with management practices such as caring for wool and mohair, improved breeding practices, dipping, immunization against prevalent diseases and use of anthelmintics for worm control.

### III. POSSIBLE APPROACH FOR RELIEF OF CONSTRAINTS

Reduction in livestock numbers would not be an easy task due to the socio-cultural importance of livestock and the present communal grazing and land tenure system. It appears that cattle numbers should be reduced to about one-third of the 1976 level and maintained at the lower level. Culling to reduce sheep numbers to no more than 80 percent of the 1976 level would be required. Goat numbers should not increase above present levels. A reduction in total numbers of grazing livestock is much more important than re-distribution of the mix of grazing livestock. Better management via a more effective extension service should be complemented to increase efficiency of production.

A project in this area might include taxation of cattle numbers to provide an incentive for reducing numbers; alternatively, mandated reductions by government might be implemented. A major area that has aggravated the overstocking situation is importation of cattle, especially by miners returning home from the Republic of South Africa. Apparently, miners have a tendency to invest in cattle to bring home rather than putting their wages into local banks. The project should include measures to stop importation of cattle except for approved breed improvement purposes. This type of program is supposedly in effect at the present time. However, due to the desperate situation of the returning miners with their cattle, import restrictions are customarily relaxed. The construction of the abattoir, as planned, could make a significant contribution to the import problem. Any cattle which are brought to the border posts could be taken to the abattoir and slaughtered, and the miners could be paid a fair market price for the animals. This would probably be only a temporary situation since importation would cease once citizens became aware that import restrictions were being enforced.

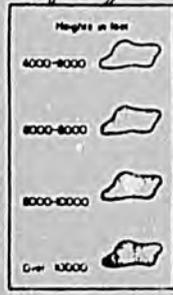
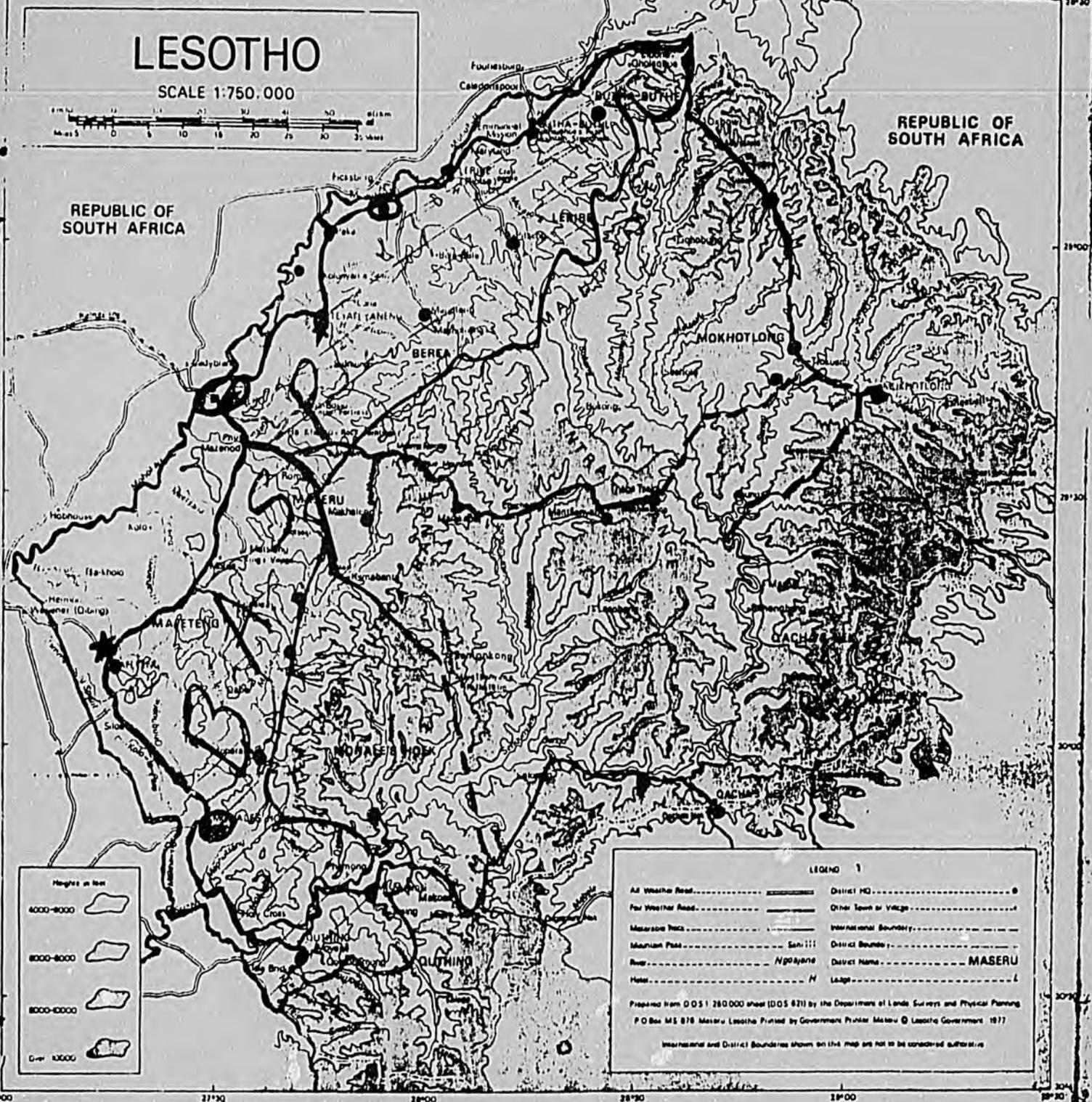
# LESOTHO

SCALE 1:750,000



REPUBLIC OF SOUTH AFRICA

REPUBLIC OF SOUTH AFRICA



LEGEND 1

All Weather Road		District HQ	
Four Weather Road		Other Town or Village	
Meteorological Station		International Boundary	
Mountain Pass		Sanctuary	
River		Ngonyane	
Hotel		Laage	
		District Name	<b>MASERU</b>
		Laage	

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★ PNC Buying Depot  
 ● Coop Letho storage shed  
 ○ Projected rail stores

**Key**

MAIN ROAD  
 ROAD WILL BE CONSTRUCTED BY DINIRS TO MAIN ROAD STANDARD  
 BROKEN LINE INDICATES PRIORITY NEEDS FOR ROAD ADDITIONS