AN AGRICULTURAL SECTOR ASSESSMENT OF MALAWI

Prepared for

Southern Africa Development Analysis Project

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

by

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September 1978

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GLOSSARY OF TERMS AND ACRONYMS

ADD	Agricultural Development Program
ADMARC	Agricultural Development & Marketing Corporation
BSc	Bachelor of Science Degree
CIDA	Canadian International Development Agency
CSC	Cold Storage Company
DA	Development Areas
EPA	Extension Planning Areas
FAO	Food & Agriculture Organization of the United Nations
FHI	Farm Home Instructresses
FTC	Farm Training Centers
GOM	Government of Malawi
IDA	International Development Agency
LLDP	Lilongwe Land Development Project
LSC	Lonrho Sugar Corporation
MANR	Ministry of Agriculture & Natural Resources
MK	Malawi Kwacha (currency)
NOIL	National Oil Industries Limited
NRC	Limited Natural Resources College
NRDP	National Rural Development Program
RDP	Research Development Program
RSA	Republic of South Africa
SECID	South-East Consortium for International Development
TA	Technical Assistants
TO	Technical Officers
TTC	Teacher Training Centers
UCA	A Synthetic from Tanzania
UK	United Kingdom

UNDP	United Nations Development Program
USA	United States of America
USAID	United States Agency for Interational Development
VTS	Veterinarian Training Service (School)
WHO	World Health Organization
WW II	World War II (2)

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AN AGRICULTURAL SECTOR ASSESSMENT OF MALAWI

I. INTRODUCTION

The purpose of this agricultural sector assessment is to determine the main constraints on the growth of Malawi's agricultural production and what can be done to remove them.

The level of agricultural production in Malawi, or any country, is a function of the quantity and quality of its agricultural resources (land, labor, and capital) and how well they are allocated. Growth in agricultural production depends upon growth in the quantity and quality of agricultural resources which is largely a function of new investments in these resources. How well resources are allocated both in production and investment depends upon incentives to produce and invest and the quality and quantity of management available.

In the following analysis various factors related to agricultural production in Malawi will be examined for their affect on the quantity and quality of agricultural resources available in Malawi as well as their affect on the allocation of these factors in agricultural production and in agricultural investment.

II. APPRAISAL OF EXISTING POLITICAL, CULTURAL AND ENVIRONMENTAL CONSTRAINTS ON AGRICULTURAL PRODUCTION

A. Political

1. Relationships with Other Countries in Southern Africa

b. Importance of RSA labor recruitment policies

Currently there are approximately 22,000 Malawi miners working in the Republic of South Africa (RSA). This is a major reduction from an estimated 200,000 miners working outside the country in 1973. The cut back in the number of Malawi miners in South Africa stems in part from a cut back ordered by Malawi in 1974 after some 70 returning miners were killed in a plane crash and by a decline in demand for foreign miners by South Africa. Malawi's current quota is 48,000 miners (2000 per month for 24 months), but South African demand is currently less than this. South Africa probably would not take as many Malawi miners as they are now were it not for favorable political relations between Malawi and South Africa. Malawi is the only black African country to recognize South Africa.

A major portion of the Malawi miners' earnings are remitted directly to the Malawi government and the miners reimbursed in kwacha, the local currency. Earnings by miners have not declined as much as their numbers, as mine wage rates have increased dramatically in recent years.

The sharp decline in the number of Malawi miners in South Africa has had a mixed effect on Malawi's agricultural development. It has increased Malawi's agricultural labor pool, but at the same time it has reduced foreign exchange earnings needed for importing agricultural inputs, potential savings for

agricultural investment, and perhaps some receptivity to adopting modern farming methods.

b. Existing foreign trade and balance of payments

International trade is important to Malawi's economy. In 1977 visible exports were $234 million (30% of GDP) while imports were $252 million, resulting in an $18 million deficit. Malawi's major exports in 1977 on a value basis were tobacco (51%), tea (23%), peanuts (6%), and cotton (2%) (Table 1). The Country's trade has been expanding about 17 percent per year since independence (1964).

Malawi's main imports in 1977 were basic and auxiliary materials for industry (35 percent), plant machinery and equipment (15 percent), and consumer goods (13 percent). Most of Malawi's external trade moves through the ports of Beira and Nacala in Mozambique.

Malawi's major trading partners are the United Kingdom, South Africa, and the United States (Table 2). Trade with South Africa has been stimulated by a mutual trade pact. Malawi is a member of the Lomé Convention, giving her preferential treatment in the European community. She gives and receives Commonwealth trade preferences.

Malawi trades very little with other Southern African countries with the exception of the Republic of South Africa. Before the closure of the border between Rhodesia and Mozambique, Rhodesia was an important trading partner with Malawi, supplying Malawi 12 percent of her imports, and taking 7 percent of her exports. Rhodesia was an important source of light industrial goods, spare parts, and hybrid seed corn (SR-5s).

Table 1.--Malawi: Domestic exports by main commodities, 1977

	1976 Revised Estimate	1977 Revised Estimate	Percent Change
	--(million kwacha)--		
Small holder crops:			
Tobacco	28.1	41.3	+46
Groundnuts	11.2	10.4	-7
Cotton	2.3	3.1	+35
Pulses	1.6	2.1	+31
Maize	--	--	--
Cassava	--	0.2	++
Sunflower seeds	1.3	0.6	-54
Rice	1.5	3.1	+107
Coffee	0.4	0.4	0
TOTAL	46.4	61.2	+32
Estate crops:			
Tobacco	36.9	50.2	+37
Tea	26.4	41.7	+583
Tung Oil	0.3	0.4	+33
Sugar	23.2	15.3	-34
TOTAL	86.8	107.6	+24
Manufactures:			
Cattle cake	0.5	0.5	0
Wooden boxes	0.2	0.3	+50
Cotton, fabric, yarn and twine	0.4	2.2	+450
TOTAL	1.1	3.0	+173
Miscellaneous Commodities	7.8	6.8	+17
TOTAL DOMESTIC EXPORTS[a]	141.0	178.6	+27
RE-EXPORTS	10.6	8.6	-19
TOTAL EXPORTS	151.6	187.2	+23

SOURCE: N.S.O., E.P.D., ARMARC. Published in Malawi Government Economic Report, 1978, p. 14.

[a]Total may not add up due to rounding.

Table 2.--Malawi: Direction of trade, percentage share of trade with main partners

	Domestic Exports				Imports			
	1974	1975	1976	1977	1974	1975	1976	1977
U.K.	36	40	47	49	23	24	22	20
South Africa	4	5	5	6	23	24	29	36
USA	10	8	13	13	3	3	3	5
Netherlands	9	7	7	8	2	2	4	4
West Germany	2	4	3	4	5	4	4	4
Zambia	4	3	2	2	3	2	3	1
Rhodesia	8	7	2	1	13	12	5	2
Japan	1	1	1	1	5	8	8	9
Others	26	25	20	16	23	21	22	19
TOTAL	100	100	100	100	100	100	100	100

SOURCE: National Statistical Office. Published in Malawi Economic Report, 1978, p. 16.

The low volume of trade between Malawi and Southern African countries other than RSA appears to be no great restraint on Malawi's agricultural development since agricultural countries in the same geographic area are seldom important trading partners. The border closing with Rhodesia has been a problem as it has increased import and export costs for those items formally traded with Rhodesia.

c. Encouragement of black independence movements

The Malawi government rejects apartheid in South Africa and supports the conservative independence movement in Rhodesia, but has not endorsed the "Patriotic Front." As a result of its conservative stand and recognition of RSA, Malawi has strained relations with most black South African countries. Malawi does not exchange ambassadors with either Mozambique or Tanzania, although most of Malawi's exports and imports flow through the former country. Mozambique and Malawi have a border dispute.

Malawi's recognition of RSA and consequent poor relations with several other African countries does not seem to have constrained her agricultural development. It no doubt has resulted in more aid from RSA.

d. Formal linkages with neighboring states

As noted, Malawi does not formally recognize two of its neighboring states, Mozambique and Tanzania, and has strained relations with Zambia. The countries do, however, communicate and cooperate on shipping and other matters. Malawi has provided Mozambique assistance with her rail and port facilities and Zambia transports some copper through Malawi to Mozam-

bique ports. This is necessitated by transportation difficulties on the Trans-Zam rail line and congestion in the Tanzanian port of Dar es Salaam.

Malawi's strained relationships with her neighbors has not been a serious constraint on her agricultural development since these countries are not natural trading partners. Being a landlocked country, however, Malawi is highly dependent on Mozambique in particular for a trade link to the outside world. Loss of this link would prove disastrous to the Malawian economy.

. Domestic Policies of Significant Importance to Agriculture

a. Foreign exchange rate structure

The Malawi kwacha (MK) is a stable currency pegged since 1975 at 1MK= 0.9487 SDR's. In July 1978 the MK exchanged at Malawi banks for $1.20. Malawi does not restrict current international payments or transfers and its exchange control regulations are non-discriminatory. Neither has Malawi entered into any bilateral payments agreements.[1]

It is difficult to know the optimum exchange rate to promote Malawi's agricultural development. A lower exchange rate would stimulate agricultural production since it would increase the kwacha prices received by farmers, or at least ADMARC, the government's marketing agency. It, however, would make import more expensive in kwacha and would thus dampen import demand for agricultural inputs as well as for inputs for other industries and for consumer items.

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[1] International Monetary Fund reports.

b. Roles of Ministry of Agriculture, Research Institutes, Cooperatives and Marketing Boards

i. Ministry of Agriculture and Natural Resources -

The Ministry of Agriculture and Natural Resources (MANR) is the main government agency for promoting agricultural development in Malawi. Its importance is reflected by the fact that His Excellency Life President Dr. Banda is the minister, and agricultural projects receive 30 percent of the development budget.

MANR is divided into two main divisions, the Agricultural Division and the Natural Resources Division. Each of these divisions is broken down into departments reflecting their specialized activities.

The newly formed Agricultural Development Department is responsible for crop development, rural development, extension and training, marketing coordination, and technical services throughout the country. It will supervise the National Rural Development Program (NRDP) activities through the 8-10 development divisions being established throughout the country. NRDP, as will be explained in more detail later, is the 15-20 year plan to expand the area development projects to encompass the whole country and is the focal point of planned agricultural development activities in Malawi for many years to come.

MANR's staff appears highly motivated, but under trained and under manned. Its sizable core of expatriates (mainly British) are being gradually phased out and will need to be replaced by qualified Malawians. Manpower training and an adequate budget to fill its many vacant positions seem to be the main constraints

on MANR's efficiency and effectiveness in promoting agricultural development in the Country.

In addition to the regular line departments in MANR, there are several statuatory bodies that manage specialized agricultural development activities. They are: Kasungu Flue-Cured Tobacco Authority, Small Holder Tea Authority, Small Holder Sugar Authority, Small Holder Coffee Authority, Cold Storage Company, and National Oil Industries. These agencies appear to be doing reasonably well, but like the ministry's line agencies, are short of trained manpower.

ii. Research Institutes - Most agricultural research in Malawi is conducted under the direction of MANR's research department. Research in forestry, fisheries, wildlife, hydrology, and geology is under the supervision of MANR's Division of Natural Resources. The Agricultural Research department has three main research stations: Chitedze (headquarters), Bvumbe, and Mokoka, and eight substations. Some agricultural research is conducted at Bunda College and by the Tea Research Foundation.

Agricultural research in Malawi focuses on developing productive packages for small holders' food and cash crops. The main constraint on their work seems to be lack of adequately skilled manpower (there are almost no Ph. D. researchers), capital support for facilities at the main and planned field stations, and for recurrent expenses in operating the stations. Malawi has requested USAID to support a major expansion and upgrading of its agricultural research program.

iii. Cooperatives - Cooperatives are not encouraged, but

are permitted if the proper authorities are convinced that the groups can carry through their proposed schemes. The failure rate of past cooperatives and the dominate role of ADMARC in marketing products and inputs explains the reluctance of the Government of Malawi actively to promote cooperatives. Lack of cooperatives does not seem to be a constraint on agricultural development in Malawi because most that have been tried have failed and the Government's agricultural marketing agency, ADMARC, has done a creditable job in marketing agricultural products and inputs in Malawi (see below).

iv. Marketing Boards - The Agricultural Development and Marketing Corporation (ADMARC) is the dominate agricultural marketing board in Malawi. The most important economic enterprise in Malawi, it buys and sells crops (in some cases is a monopoly buyer), establishes markets and warehouses, supports prices, develops agricultural production and processing facilities, supplies agricultural inputs, and supports research and some private agro-industries.

ADMARC is administered by its executive chairman and from four to eight directors from its headquarters in Limbe and three regional offices. The main crops handled are tobacco, cotton, peanuts, corn, pulses, cassava, and paddy rice. Surpluses of commercially grown cash crops are available for export. Secondary crops traded by ADMARC include sunflower seed, wheat, arabica coffee, oilseeds, and miscellaneous cereal and horticultural products.

To facilitate the marketing of agricultural products in Malawi, ADMARC maintains 52 main storage depots/markets and

700 seasonal buying stations. ADMARC has over 250,000 tons of storage capacity placed throughout the country.

Minimum prices are guaranteed to farmers by ADMARC. They are announced at planting time, but may be increased at harvest if market conditions allow. In 1976 ADMARC had a $15 million price support reserve and a crop reserve (in storage) of $7 million.

ADMARC's development division operates several estates and agricultural processing facilities. Commodities produced on their estates include tobacco, nuts (cashew, tung, and macadamia), corn, sorghum, beef, pork, eggs, and broilers. Smaller scale projects are used to evaluate the production of citrus and pyrethrum, and for the export of Karaya gum, honey, and beeswax.

In addition to the above, ADMARC provides farmers with such agricultural inputs as improved seed (some from their own farms), fertilizers, pesticides, spraying equipment, farm carts, and plows. They also invest in other agro-industrial and financial enterprises.

ADMARC has grown considerably in size and profitability. In 1975-76 its net assets were $6 million and its trading profit was $12 million (19 percent return on equity). In 1975-76 its administrative and selling expenditures were each 4.0 percent of sales.

Lack of an active marketing board is obviously not a constraint on Malawi's agricultural development. ADMARC's main constraint on agricultural development in Malawi appears to be the relatively low prices it pays farmers for many agritultural

commodities. This is discussed in the following section.

c. Price controls on commodities

The Malawi Government regulates the prices of petroleum products, meat, sugar, matches, cloth, and hoes, and strongly influences the prices of most agricultural products through ADMARC buying policies. ADMARC is the monopoly buyer of small holder tobacco, confection peanuts, cotton, commercial cassava, rice, and coffee, and thus directly controls their prices. ADMARC is the exclusive exporter of these and most other non-estate agricultural exports. Being the exclusive purchaser of many agricultural products and the exclusive exporter of most of the remaining crops, ADMARC's buying prices are the determining ones, or are very influential.

ADMARC pays farmers relatively low prices for their products for four reasons:

i. To make a profit on investment in agricultural development projects such as agricultural processing, storage, markets, land development, seed production, etc.

ii. Provide revenue to the government (40% of their profits).

iii. To make sure that the prices guaranteed to farmer at planting time do not exceed the prices, less costs, that ADMARC sells the products for after harvest. ADMARC's fixed buying prices help stabi lize agricultural prices throughout the country.

iv. To pay ADMARC's relatively high overhead costs. ADMARC maintains 52 main storage depots/markets

for the various crops, supplemented by over 700 seasonal produce-buying centers. Not all their processing facilities operate at a profit and not all products are traded at a profit and these costs and losses must be covered.

ADMARC's main source of profit is small holder tobacco, peanuts and cotton. These are purchased in volume at relatively low prices and exported at world prices.

ADMARC's policy of paying relatively low prices for agricultural products is, of course, a constraint on agricultural development in Malawi. If farmers were to receive prices more in line with free market levels, they would be stimulated to invest and produce more, particularly cotton and confection peanuts. They might be "over stimulated" on fire cured tobacco as the world market is considered quite thin. If ADMARC did not show a sizable profit, however, the Government would be forced to find new revenue sources and ADMARC would have to find new sources of funds for agriculture and market development. Farm prices would also be less stable. Economists in the Ministry of Agriculture and Natural Resources (MANR) and from donor agencies have argued for higher farm product prices, but so far ADMARC has not changed its basic pricing policies and probably will not until a lot more pressure is brought to bear on them.

d. Taxation

Malawi has numerous taxes for financing the Central government. Central government tax revenues in 1977-78 were

MK 85.1 million.[1] In addition, there were appropriations-in-aid of MK 15.6 million and other income of MK 11.2 million for a total revenue of MK 111.9 million. Malawi's major taxes are described below.[2]

i. Direct taxes (49%)

(a) Minimum tax (2%) - 3.50 MK for every male 18 years old and older.

(b) Graduated tax (2%) - A graduated wage tax on employees with earnings under MK 900 per year.

(c) Pay-as-you-earn (11%) - A graduated tax on employees with earnings of 900 MK or more per year.

(d) Income tax on companies and self employed (33%) The company rate is 45%, plus 5% if not incorporated in Malawai. Personal income over 11,000 MK is also taxed at 45% after certain deductions

ii. Indirect taxes (51%)

(a) Import duties (18%) - There are generally no duties on raw materials. Duties are low on some manufactured goods and 30% on most manufactured goods. Goods from the United Kingdom have a preference as do goods from other Commonwealth countries. The most-favored-nation rate is

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[1] Malawi Government Economic Report 1977, p. 63.

[2] Based on International Monetary Fund reports.

applied to the rest of the world. There are protective duties on clothing, textiles, beer, and spirits.

(b) Excise duties (6%) - These are mainly on domestic manufacturers including tobacco product: alcoholic beverages, soap, sugar, soft drinks, and woven cotton fabric.

(c) Surtax (28%) - a 15 percent tax on consumer goods imports and domestic manufacturers.

The above tax structure does not seem unduly burdensome on Malawi's agriculture production. Most farmers would pay only the 3.50MK annual head tax, plus indirect taxes on those purchased manufacturers that are taxed. It appears the main tax on agriculture is the profit on agricultural products taken by ADMARC.

Cultural

Traditional Attitudes and Practices Which Affect the Decision-making of Agricultural Producers and the Role of Women

The system of land tenure, inheritance, and role of chiefs is extremely complex in Malawi.[1] In general, the land is allocated by the chief and there is no private ownership or rents, although some share cropping exists. The family is expected to provide land for the newly married sons and daughters, depending on in whose village they choose to live. The deter-

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[1]For details, see Area Handbook for Malawi (1975).

mination of inheritance differs according to region, but the majority follow a matrilineal pattern, so that land rights pass from a man to his sister's children. In other areas a patrilineal system is followed. In general there is only a single successor to the family holding who is then expected to support other family members. This has the advantage of preventing the fragmentation found in many developing countries but leads to a problem of providing work incentives to other members of the family.

With respect to religion, the majority of the population adheres to indigenous religious systems. About 35 percent of the population are Christians and 12 percent are Muslims.[1]

As in many developing countries, women play an important part in agricultural production. They do all types of farm labor except for the heaviest work in seed-bed preparation. The extension service provides women instruction and information on health and nutrition through a system of "home economics agents. The women are accepted in the more modern occupations and policewomen are a common sight in the urban areas.

Details on family planning are in the SADAP health teams' report. It should be noted that polygamy is practiced and children are considered important labor inputs in the farm community.

Educational opportunities are available to women at all levels from primary school through the university. However,

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[1] Area Handbook for Malawi, p. viii.

there is some stereotyping of roles. For example, women at Colby College, the vocational training school, are only enrolled in the "home economics" course.

C. Environmental

1. Natural Constraints to Increased Agricultural Output

a. Soil types

Malawi soils are quite diverse. Most developed from underlying granites and limestones and are relatively weak. Areas of highest rainfall are heavily leached. The plateaus and uplands are covered with ironbearing gritty clays. The alluvial soils found in the Shire Valley are the country's best and have attracted the densest population. Dambos, low lying wet soils, are usually used for communal grazing.

In general, however, the nation's soils are moderately productive, and although there are problem areas, the soil resources are not a major constraint to a viable agriculture.

b. Rainfall

Malawi has three basic seasons: the rainy season from November to May; the cool season in June and July; and the hot dry season in September and October. Rainfall varies from 30 to 60 inches over 90 percent of the country. The rainfall is highly variable from year to year as well as within a given season. The farmers response to the risk associated with seasonal variability of rain has reportedly contributed to less than recommended applications of fertilizer.

c. Temperature variation

There is substantial seasonal and regional variation

in temperature. In the lower elevations, such as the Lower Shire Valley, the warm season is very hot and humid with frequent readings of over 100° F. Temperatures are relatively comfortable, however, on the Plateau. At Lilongwe (3,400 feet) for example, average monthly temperatures range from 58° F. in July to 74° F. in November. Frost is rare in most of the country. In general, temperatures do not act as a major constraint to agricultural production, and, in fact, provide the basis for the diversity of agriculture found in the country.

d. Erosion and drainage

Erosion is a serious problem in the escarpment area and hill zones in the rainy season and great care must be taken in cultivating these areas. The new Lake Road has been damaged by erosion in some areas.

A major drainage problem is lack of maintenance on the nation's irrigation schemes. Some field drains and main canals have fallen into disrepair. Major attention needs to be focused on this problem if the nation is to continue with a viable irrigated agriculture. Highest priority needs in this area are probably the cleaning of silt from the canals and drains, and development of a program for soil stabilization.

e. Water potential

Though Malawi has relatively good rainfall her ground water resources are relatively poor owing to a lack of underground aquifers to hold the water. Malawi has abundant lake water resources. Lake Malawi, one of the largest and deepest lakes in the world, is 350 miles long, a prime source of fish and a major transport artery. Lake Malombe and Lake Chilwa

are important sources of fish as are the waters of the Shire River which also provide the country's hydroelectric power. Water for irrigation is drawn from several rivers near their confluence with Lake Malawi and from the Shire River. The Shire River flows into the Zambesi and thus some type of international agreement may be necessary before large quantities of water are diverted from the river system.

f. Geographic relationships to neighboring states

First, it should be emphasized that Malawi is a landlocked nation. Thus, except for air transport, Malawi must depend on its neighbors for both the exports of its products and imports of its supplies. Although there are political differences as noted above, a pragmatic approach is used in dealing with its neighbors. Much of the nation's commerce passes through the port facilities of Mozambique, which has lead to problems of both transportation and dock handling and storage. The fact that about 75 percent of the nation's exports were purchased by the United Kingdom, United States, and the Netherlands indicates the need for good relations with neighboring states. Because of political pressures, there has been a substantial decrease in trade with Rhodesia, with imports dropping from 15 percent of total in 1973 to estimated 2 percent in the first half of 1977. In the same time period, exports to Rhodesia dropped from 6.5 percent to less than 2 percent.

III. APPRAISAL OF EXISTING SUPPLY CHARACTERISTICS IN AGRICULTURE

A. Land Use Potential

1. Areas Now Utilized for Agricultural Production

Malawi has 23 million land acres of which in 1968/69 26% were under cultivation. Estimates of the proportion of arable land that is cultivated range from 56 to 86 percent.[1] Most of the arable land that is not cultivated is in the more remote parts of the country. Finding new arable land for Malawi's growing population of farmers is becoming an increasing problem.

Malawi produces a large variety of agricultural products on its land, the most important of which on a weight basis are corn, cassava, and peanuts in the shell. Malawi's other important crops are tobacco, sugar, rice, cotton, beans and fruits and vegetables.

Corn, occupying 85 percent of the cultivated area, is by far the country's major farm product. It is primarily (82 percent) used for human consumption. In good crop years some is exported. Cassava is planted as insurance against a bad corn year. Some has been exported to Europe for livestock feed. Peanuts are grown for home consumption

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[1] Low figure found in Malawi Statistical Yearbook 1977. High figure from Government agricultural officials.

(66 percent), commercial crushing, and export for the confection market. Tobacco, tea, and sugar are primarily for export.

a. Sources of New Land

Most of the new land brought under cultivation will be marginal land in the traditional farming areas and relatively good land in the more remote northern areas. Some new irrigated projects will be developed along Lake Malawi and the Lower Shire River.

b. Existing vs. Potential Cropping Patterns

If GOM strategy succeeds, food crop yields will increase allowing more land to be shifted to cash crops for export. There has been quite an expansion in tobacco acreage on newly cleared land and a new sugar estate and factory are being established at Dwangwa on the west bank of Lake Malawi. If food crop yields do not expand faster than demand, about 5 percent per year, cropping patterns are not likely to change much in the medium term.

2. Labor Inputs

About 90 percent of Malawi's labor force works in agriculture, mostly in the smallholder sector. The level of technology used in smallholder agriculture is quite low. Almost all smallholders cultivate with a hoe and plant, fertilize (if any), and harvest by hand. As a consequence, output per worker is low. Farms average 3.5-4.0 acres in size, about the maximum area a man can cultivate with a hoe.

Labor in the estate sector is generally more skilled than in the smallholder sector. Estate management trains workers in modern cultural practices and in the use of farm machinery.

Most smallholder land is owner operated. These farmers fail to use some basic cultural practices that would significantly raise their yields, perhaps for lack of skills. MANR officials point out that extension workers have been exhorting farmers for 20 years to plant their corn earlier and closer together, weed better, and harvest sooner. If they did, their yields would increase 50 percent at no extra cost. Most farmers have not applied these simple practices. Perhaps the extension service is not getting its message across.

There seems little question but that the main constraint on agricultural production in Malawi is farmers' failure to use the best cultural practices available. The problem is to make sure they know these practices and getting them to use them.

Wage rates in agriculture are low. In 1977 they were 12.34 MK ($15) per month. This compares with an average of 30 MK per month in all sectors. Average monthly wages in Malawi in 1977 were 42 MK in manufacturing and 60 MK in transport storage and communication.[1] It should be kept in

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[1] Malawi Economic Report, 1978, p. 51.

mind that most agricultural labor is self employed. The statutory minimum daily wage in Malawi differs by area of the country. In 1976 it was 40 tambala (48¢) in Blantyre-Limbe; 35 tambala (42¢) in Zomba, Lilongwe, and Mzuzu; and 25 tambala (30¢) in all other areas including rural areas.[1]

3. Capital Inputs

The present credit system for smallholders is fragmented as there is no central agricultural credit bank. ADMARC extends a limited amount of credit for the purchase of small items of farm equipment (sprayers, etc.) but does not extend credit for the purchase of fertilizer or seed. There is a government loan board that makes loans to individuals and groups, but the process of loan review and approval at the top is long and complicated. An effort is being made to shorten the process, but progress has been slow.

Separate credit funds are included in the annual budgets for the four rural development projects and the repayment record has been good. However, the level of participation and the amounts borrowed are quite low (Table 3).

Only about one-fourth of the families in these four project areas utilize credit, with the proportion ranging from a low of 13 percent in Karonga to a high of 39 percent in Shire. The amounts borrowed appear to be sufficient for one or two bags of fertilizer and a small quantity of seed.

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[1] Malawi Statistical Yearbook 1977

Table 3. Malawi: Borrowing Record in Rural Development Projects

Rural development project	Total number of families	Number of seasonal borrowers	Amount (KWACHA)	Average amount (KWACHA)
Lilongwe	104,000	24,616	859,533	34.92
Shire	70,000	27,000	477,342	17.68
Lakeshore	67,000	18,500	350,607	18.95
Karonga	38,000	5,015	75,829	15.12
TOTAL	279,000	75,131	1,763,311	23.46

Interest and service charges, 15 percent for a six-month loan, are lower than in the private market. Repayment is assured by a deduction from the sales proceeds when farm commodities are marketed. A small scale credit program also is operated in connection with a stall feeding program for cattle.

Lack of readily available smallholder credit appears to be an important production constraint and steps should be taken to correct the situation. Discussions have been held within government regarding establishment of a central credit agency, but no decision had been made as of mid-1978 as to which agency would have administrative responsibility or the source and amount of capital. These issues are especially relevant in view of the predominance of subsistence farmers and their reluctance to use credit. As progress is made toward more production for sale, the need for a broader based credit program will become more apparent.

4. Transportation and Storage Inputs

Good transportation and storage, of course, are essential for efficient agricultural marketing. Malawi officials are aware of this and have invested heavily (often with donor support) in this area though, of course, the quality of the system, except for the railroads and some trunk highways, is not up to Western standards.

Agricultural transportation and storage is handled mainly by ADMARC. The Central Government is responsible for the major roads, railway, and air links. The four major agricultural development projects (Lilongwe, Karonga, Salina, and Lower Shire) have stressed feeder road construction while other rural areas are not as well served.

Most agricultural goods are transported to ADMARC's markets by head loads or in ox-drawn, rubber tire carts. These are well designed and the system is capable of moving along the rough feeder roads most months of the year. ADMARC's trucks deliver inputs and collect agricultural products from their 700 or so markets, so this link in the transportation network is not a serious problem.

The Malawi government has a strong commitment to road construction. Several main roads are being blacktopped and the rail system is being extended from Lake Malawi to the Zambian border with Canadian assistance.[1] USAID is

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[1] Zambia, however, seems to be making no effort to link its rail system to this line even though it would give them direct access to Mozanbique's ports.

helping pave the main highway between Lilongwe and the Zambian border. About 22 percent of Government expenditures on development account for 1978-79 is budgeted for roads of all types.[1] Between 20 and 30 percent of the NRDP project area development costs for the first five years are for roads.[2]

ADMARC has a fairly well developed agricultural storage system. Storage is located at the main rural markets as well as in the major cities. The latest ones built are quite modern by any standards. The Government is considering silo storage for up to 10 percent of its corn crop as a national reserve in keeping with the World Food Conference's recommendations. At least one donor has shown interest in this expensive project.

It appears that the transportation and storage of agricultural products is not a serious constraint (at least not as serious as many other things) on Malawi's agricultural development. Both should continue to be upgraded, but a major portion of AMARAC's and the national budget is already being spent in this area.

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[1]Calculated from data in Malawi Government, National Rural Development Programme, 1978-83, Project Proposals Submitted to I.D.A., MANR, 1977.

[2]Calculated from data in Malawi Government, Economic Report 1978, Budget Document No. 4 (Zambia Government Printer, 1978), p. 65.

5. Other Inputs - Fertilizer, Pesticides and Extension

a. Fertilizer

Malawi farmers use four main fertilizer formulations, all but one of which is mainly nitrogen. They are: (1) sulphate of ammonia - 21% N and somewhat acidic, (2) calcium ammonium nitrate - 26% N, (3) 20:20:0 compound - 20% P_2O_5, and (4) urea - 46% N.

Supplies of fertilizer and the distribution network appear to be adequate for the present low level of demand. ADMARC provides fertilizer to smallholders, and OPTICHEM, in which ADMARC holds a 20 percent stock interest, distributes to estate farms. Tonnages distributed through each outlet were about 43,000 MT in 1977-78 (Table 4). However, the acreage in estate farms is only 2.5 percent of that in smallholders' farms, indicating a much lower rate of use on the latter.

With no domestic production, all fertilizer supplies must be imported. Nearly one-half of the tonnage sold in 1977 was ammonium sulphate and most of the rest was other forms of nitrogenous fertilizers. Only small quantities of super-phosphate and mixed fertilizers are used by smallholders. However, a much wider range of fertilizers are used on estate farms for such speciality crops as tea and sugar cane.

Although ADMARC has considerable quantities of fertilizer in central storage depots, and seasonally at distribution points throughout the country, apparent consump-

ion by smallholders did not increase significantly from 1972 through 1975. High import prices and a reduction in the producer subsidy in 1974-75 resulted in a sharp reduction in sales as crop prices were not increased proportionally. Sales increased sharply in 1976-78, apparently the result of increased acreage and returns from tobacco. However, only a small proportion of smallholders use any fertilizer despite efforts in the four intensive rural development projects to encourage farmers to do so by price subsidies in some years. Buying prices for farm commodities have lagged behind input costs with the result that the ratio of prices paid to those received declined to 80 percent by 1975-76 in relation to 1970 as 100.

Table 4. Malawi: Fertilizer sales by market outlets, 1972-73 through 1977-78

Year	ADMARC[a]	OPTICHEM[b]	Total	To Small-Holders
	-------(metric tons)-------			(percent)
1972-73	25,185	41,808	66,993	38
1973-74	31,736	35,415	67,151	47
1974-75	14,847	44,808	59,655	25
1975-76	22,349	38,019	60,368	37
1976-77	30,536	37,855	68,391	45
1977-78	43,293	43,519	86,812	50

SOURCE: Fertilizer Manufacture Project, Prefeasibility Study, Min. of Agr. and Natural Resources, Planning Div., May, 1978.

[a]Sales to smallholders.

[b]Sales to estate farms.

Fertilizer availability does not appear to be an important constraint on agricultural production in Malawi, but the low level of its use is a great constraint. Farmers using fertilizer and other improved cultural practices can increase their corn yields 150 percent. Similar yield improvements are possible with many other corps. Their failure to use improved farming techniques seems to be the result of a combination of circumstances, some discussed previously and some to be discussed later. They are summarized in the final section of this report.

b. Seeds

Most farmers plant traditional varieties selected year after year from the best of the previous season's crop. Only about 8 percent of Lilongwe Land Development Project farmers use improved varieties of corn. The best of the improved corn varieties are SR-52, a hybrid developed several years ago in Rhodesia, and UCA, a synthetic from Tanzania. Part of the explanation for the low use of improved seeds is their cost and performance. The improved corn varieties, for example, are softer (dents). Although higher yielding, they do not pound (mill) well, taste as good as the traditional varieties, and don't store well. Weevil attacks it both in the field and in storage.

There is a great need for developing improved plant varieties adapted for Malawi's soils and climate and for multiplying and distributing their seeds. Improving plant varieties is the responsibility of the agricultural research

program. Seed multiplication and distribution is handled in part by ADMARC. By the 1978-79 season the Government plans to have sufficient quantities of hybrid seed available for distribution to farmers. Supplies have been short since Mozambique closed the Rhodesian border.

c. Land Improvements

Malawi farmers spend relatively little on land improvements. Very few fields are fenced, making crops vulnerable to damage by livestock. Some areas are irrigated but maintenance of canals, field channels, and drains is a problem. Many bore holes have been drilled, but the failure rate is reportedly high. Soil erosion is a problem in the steeper areas. The extension service promotes contour ridging to help overcome this and the Lilongwe Land Development Project has developed a system of terraces for the same purpose.

Lack of investment in land improvement by farmers, especially maintenance of irrigation systems and erosion control, is, of course, a constraint on Malawi's agricultural development. Farmers need to be educated and motivate to make those improvements which are within their means and which show a favorable return.

d. Pesticides

Malawi farmers are low users of pesticides in spite of their obvious benefits in many situations. In 1968-69

only 1.6% of Malawi farmers reported using pesticides.[1] Most of these were probably cotton farmers with whom there has been a special effort to increase adoption and where returns on pesticides are particularly high. Pesticides are imported and distributed by ADMARC and are thus generally available. The use of pesticides in Malawi will no doubt increase as more farmers adopt more modern crop varieties. They are generally more susceptible to insect attack than the traditional varieties. This partly explains their relatively slow rate of adoption.

6. Extension Service

The Ministry of Agriculture and National Resources interfaces with Malawi farmers through its various technical services. The Ministry has 2,097 staff positions at four basic levels:[2]

-- Technical assistants (TA) who have direct contact with farmers and fishermen (75%).

-- Technical officers (TO) who supervise the TA (17%).

-- Professional (5%) -- Super scale officers (3%) who plan the Ministry's program and supervise their operations.

In 1977, 16 percent of all staff positions were vacant, one of MANR's more serious problems. Vacancies are caused by lack of trained personnel and a shortage of resources.

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[1] Malawi Statistical Yearbook 1977, p. 86.

[2] See Table I, Appendix D.

The heaviest concentration of extension personnel has been placed in the four project areas. The number of farm families per technical assistant there ranges from 500 to 1000. The TA's promote good cultivation (hybrid seed, fertilizer, weeding, ridging) and animal husbandry practices (artificial insemination, dipping for ticks, ox plowing, fattening) among farmers. They also operate technical training schools where farmers can come for resident short courses. Extension agents are supported by the Ministry's Extension Aids Department which develops visual materials and has mobile units presenting educational films and puppet shows.

Extension workers in Malawi have the problem of extension workers everywhere of getting farmers to come out for meetings and demonstrations, and getting them to farm as well as they know how. The agents seem to have fairly good coverage as evidenced by the fact that 60 percent of Lilongwe project farmers interviewed had had contact with an extension agent.[1,2]

B. Management Decisionmaking

1. Size of Production Units

Malawi has two basic types of farms, smallholdings and estate. The smallholdings average 4 acres in size and are generally farmed in a traditional manner. They produce traditional food crops and in some cases cash crops, particularly fire-cured tobacco. The estates, a legacy of the colonial period, average

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[1] Survey of Smallholder Agriculture, Maize Crop Husbandry, Lilongwe Land Development Project, 1978, p. 26.

[2] For more details on Malawi's manpower training needs and problems, see Appendix

about 720 acres and are farmed using modern civilization practices and machinery. They produce mainly cash crops such as flue-cured and burley tobacco, sugar, tea, rice, and cotton. Some grow corn and peanuts as well.

In 1973 there were 367 non-tea estates and 30 tea estates in Malawi.[1] The average flue-cured tobacco estate grew 241 acres of tobacco. In 1968/69 there were 885,000 smallholdings. The average smallholder tobacco farmer grew 1.66 acres of tobacco.

The average smallholding (4.0 acres) supports 4.6 people or 1.5 persons per acre (Table 5). In addition, it must produce enough surplus to feed the 10 percent of the Malawi population not on farms and some products for export. Most estate crop production is exported.

Table 5. Malawi: Number and Percent of Smallholdings and Number of People Living on Smallholdings by Size of Holding, 1968-69.

	Size of Holding (Acres)					
Item	0.0-1.9	2.0-3.9	4.0-5.0	6.0-11.9	12.0+	Total No. of Holdings
Percent of Total Holdings	29%	34%	18%	17%	2%	885,000
Average Number of Persons per Holdings	3.8	4.6	5.0	5.6	6.3	4.6 average

SOURCE: Malawi Statistical Yearbook, 1977. (Zomba: Government Printer, 1978), p. 85.

[1]Office of the President and Cabinet, Department of Lands; and Teas Assoc., Ltd., published in Transistion in Souther Africa, Malawi, USAID, 1977.

The small size of the typical Malawi farm is a constraint on increasing agricultural production in the country. Farms are too small and consequently incomes are too low for farmers to afford modern farm machinery. As a result, they must till and cultivate by hand. This does not allow them to start tilling until after the rainy season starts, nor does it enable them to till as well (turn under the weeds as effectively) as they could with tractor plowing. Malawi's large number of small farmers also greatly increases extension education costs per acre.

2. Characteristics and Incentives of the Malawi Smallholder

The typical, traditional Malawian farmer has the following characteristics that tend to be a constraint on increasing agricultural production in the country:

a. Low level of formal and extension education. Less than 25 percent are literate and extension workers reportedly contact relatively few farmers in their areas on a continuing basis.

b. Farms a small acreage with a hoe. Farms average about 4 acres and many are fragmented (in several parcels). Breaking the soil before the rain starts and turning weeds under with a hoe is difficult. Four acres is about the maximum area a man with a hoe can cultivate.

c. Farms at a subsistence level, consumes most of what he produces, sells little for cash. He prefers varieties that taste and store well to higher yielding varieties for home consumption.

d. Like most farmers, he is conservative by nature. He tends to avoid the risks associated with debt, new crops and varieties, and the use of fertilizer.

e. Like most farmers, he also does not farm as well as he knows how, only as well as he feels the need to. He, thus, may not use the best cultural practices or take the most prudent care of his crops and livestock.

The typical Malawian farmer has his innate incentive to increase his agricultural production dampened in several ways as well:

a. By tradition he must share his wealth with his extended family. They can claim a share of any increased output.

b. He does not have clear title to his land. Customarily land is owned by the village and allocated by the headman according to need. It normally cannot be mortgaged, bought, or sold. Because smallholders do not have a clear title to their land, they logically have less incentive to improve it and can't use it as collateral for a loan to improve it.

The Lilongqe Land Development Project has strengthened ownership rights in the project area by surveying farms and registering the land in the name of the family. Agreement among villagers has to be reached on boundaries. Some fragmented parcels have been consolidated.

c. He may not have as strong a desire for consumer goods as farmers in some parts of the world. Few consumer

goods are available for sale in the village. Few villages are electrified, thus there is virtually no demand for electrical appliances and there is no television encouraging listeners to buy consumer goods.

d. He receives relatively low prices for his products and pays relatively high prices for his inputs. Export and import costs are high due to the distance and transport difficulties to and through the Mozambique ports.

The above farmer characteristics and factors limiting his incentives explain a lot about his slowness to adopt modern cultivation practices inspite of the higher yields they would bring. The latter are reflected in Table 6 which indicates that yield increases of 43 to 222 percent are possible depending upon the crop. A discussion about production opportunities for individual crops is found in Appendix C.

3. Evidence of Risk Averse Behavior

The strong tendency for Malawi farmers to avert risk is reflected by the fact that few have adopted high yielding varieties or spend much money on modern inputs. They are reluctant to put out money in part for fear the crop might fail and the investment would be lost.

In 1968-69 only 12.9 percent of the Malawi farmers surveyed used fertilizer and only 1.6 percent used insecticides. The average farmer spent 1.4 cents per acre on fertilizer and insecticides combined, 0.3 cents per acre on

seeds, and 1.2 cents per acre on land tools. His biggest expenditure was for labor, 6 cents per acre.[1]

Table 6. Malawi: Yields per acre for selected crops using unimproved and improved farming techniques

	With Unimproved Farming Techniques	With Improved Farming Techniques	Percent Increase
	--------(lbs./acre)----		
Maize	1,200	3,000	150
Groundnuts	400	790	98
Fire-cured Tobacco	250	490	96
Flue-cured Tobacco	--	1,250[a]	--
Burley	700	1,000	43
Cotton	450	880	96
Rice (Irrigated)	--	3,500[c]	--
Rice (Rainfed)	1,500[b]	1,500[d]	67
Cassava	900	2,900	222
Pulses	300	650	117

SOURCE: Ministry of Agriculture and Natural Resources, National Rural Development Programme, Policies, Strategy and General Features, 1977

[a]Large scale farmers and smallholders

[b]Rainfed rice.

[c]Irrigated rice.

[d]Improved rainfed rice.

[1]Malawi Statistical Yearbook 1977, p. 86.

Unwillingness or inability to invest in agricultural inputs has been a definite constraint on Malawi's agricultural output.

C. Potential for New Types of Activities

1. Rural Processing Activities for Existing Commodities

There does not appear to be any great potential for developing much in the way of new rural processing industries in Malawi. Present Government, quasi-government, and private firms are able to process current output and often more. It is usually more economic to add capacity to existing plants than to build new ones. ADMARC, National Oil Industries, Malawi Development Corporation, and others are fairly alert to new agricultural processing opportunities as they arise. More urban oriented processing facilities such as milk pasturizing plants, livestock slaughter houses, and bakeries will be needed as growth centers expand.

2. New Commodities

Malawi officials are alert to finding new commodities to grow and old ones to expand where the profit potential is good. The rapid expansion in tobacco, sugar, and tea production (all in the estate sector) attest to this. Smallholder production of fire-cured tobacco would expand if it were not limited by a quota. There is some current interest in silk worm cultivation and this might develop

into a new industry. Interest in profitable new estate crops in particular does not appear to be a constraint on Malawi's agricultural production.

IV. APPRAISAL OF EXISTING DEMAND CHARACTERISTICS IN AGRICULTURE

A. Structure of Domestic Markets

Malawi has a dual marketing system for farm products, the private system involving private transactions at many points from the farm gate to the urban centers and the public system operated by ADMARC. ADMARC operates 700 buying stations, many temporary, and plans more with the expansion of integrated project areas under NRDP. ADMARC's goal is to ensure that no farmer is without a convenient cash outlet for his crops at harvest time (NROP 1977). Private traders operate in every village, at local markets, at the District Council markets (held at fixed times and places, but with minimum standard marketing facilities), and in urban markets. Some private traders are licensed to buy for ADMARC and some private traders buy from ADMARC, thus the private marketing system and ADMARC's system are sometimes interwined.

ADMARC is the monopoly buyer of cotton, rice, smallholder tobacco, confection peanuts, coffee and tung nuts. Estates (sugar, tea, tobacco) can sell their products directly to foreign buyers. Smallholders have the choice of selling their food crops (except confection peanuts) to private traders or ADMARC and choose the one paying the most. ADMARC supports the prices of many food crops with minimum price guarantees. These are announced at planting

time. They may be raised at harvest if market conditions warrant.

Considerable livestock and fish (often dried) products are marketed in Malawi, largely in the private sector. The Department of Animal Health and Industry operates 3 milk processing plants and a market for eggs. They have also established many cattle markets and a cattle trail to bring cattle down from the North. Cold Storage Company operates two livestock slaughter houses, both for their own use and use by private butchers.

ADMARC and Optichem (for the estates) are the exclusive fertilizer importers. ADMARC distributes fertilizer and other farm supplies (seed, pesticides, sprayers, farm carts, ploughs, etc.) through its rural outlets. Consumer goods are available in the market towns and urban centers. The Government encourage shops to locate near the larger ADMARC markets. Indian merchants are limited to urban centers.

1. Marketing Institutions

Malawi's use of grades and standards is not well developed. Smallholders sort their own tobacco and sell it by grade but ADMARC must re-sort and grade it to international market standards. Most grain is sold ungraded. Farmers selling cattle through Cold Storage Company (government statutory agency) are paid dressed weight which seems a very advanced practice for a less developed country.

Malawi's marketing information system for the private sector is relatively poor owing to a lack of good mass communication in the rural areas. ADMARC, by announcing its buying prices 6 months in advance, permits sellers to be well informed at least on minimum prices.

Farmers in project areas, at least, can buy farm supplies on credit. It is given in-kind and farmers repay it through deductions from their receipts when the crops are sold.

It appears Malawi farmers are relatively well served by the marketing system. ADMARC does a commendable job in seeing that all farmers are served by markets and have the benefits of at least a guaranteed minimum price. Losses from serving the remote farmers must be made up by profits in other areas. The Department of Animal Health and Industry should also be commended for its efforts to facilitate livestock and livestock product marketing.

B. Structure of Domestic Consumption

1. Analysis of Expenditure Surveys

There are no recent surveys of consumption expenditures in Malawi, but an estimate of per capita consumption of food can be made from the country's latest estimates of population, food production and trade (1973). Demand can be projected using income elasticity data developed by the Food and Agricultural Organization of the United Nations (FAO).

Based on net availabilities of food, Malawians eat rather well. Per capita availabilities of grains, beans, peas, and peanuts is approximately 773 pounds per year, or over 2 pounds per day (Table 7). This should supply an adequate amount of calories, and when supplemented with available animal products (an average of at least 39 pounds per capita per year), an adequate amount of balanced protein as well. The chief animal product in the diet is fish, followed by beef. Fish make up about three-fourths of the animal products in the diet, suggesting that fisheries deserve greater recognition in Malawi's food policy.

Income elasticities of demand for food in Malawi estimated by FAO suggest where expansion in food demand will take place as incomes rise. The highest income elasticities of demand are shown for sugar and rice (1.20), followed by that for meat (1.10) (Table 7). The lowest income elasticities of demand for food items are for cassava (0.35) and corn, millet and sorghum (0.40). The demand for these products will expand the least in the future relative to increases in income.

Table 7. Malawi: Production, Net Exports, Per Capita Availabilities and Income Elasticity of Demand for Selected Foods, 1973

Food Item	Total Production	Net Exports	Total Availability	Per Capita Availability[a]	Income Elasticity of Demand
	(000 short T.)	(000 short T.)	(000 short T.)	(pounds)	
Corn	1,413	40	1,373	572	0.40
Millet and sorghum	106	--	106	44	0.40
Cassava	92	30	62	26	0.35
Rice, paddy	46	16	30	12	1.20
Groundnuts, shelled	136	30	106	44	0.50
Beans and peas	187	8	179	75	0.50
Potatoes	12	--	12	5	0.70
Other vegetable leaves	140	--	140	58	0.70
Fruit	180	--	180	75	0.75
Cane sugar	54	20	34	14	1.20
Meat (75% beef)	17	--	17	7	1.10
Fish	77	1	76	32	0.60

SOURCE: Malawi Statistical Yearbook 1977. pp. 82, 101
FAO Agricultural Commodity Projections 1970-1980, p. 197
NRDP Policies, Strategy and General Features, p. 28

[a]Population estimated at 4.8 million in 1973.

Net food availabilities in Malawi reflect the typical Malawian diet. The basic ingredient is a stiff porridge, made usually from corn but sometimes from cassava, rice, or millet. This is torn off and dipped in a relish of spices or meat. Peanuts are pounded into a butter or roasted. Home made beer is very popular.[1] Wheat bread is becoming popular among urban dwellers and the demand for it can be expected to expand more rapidly than incomes.

2. Potential for Import Substitution

a. Imported commodities which could be produced locally

Malawi is primarily an agricultural country with little mineral wealth and little industry outside of agricultural processing. It is planning a fertilizer plant using hydro power to substitute for fertilizer imports ($12 million in 1976). The output of the planned Viphya wood pulp plant near Mzuzu will be exported to Asia, but earnings will be used to import other items. Malawi imports a few agricultural products. In 1976 they included dairy produce, eggs and honey ($3 million), cereals ($2.6 million), products of milling industry (some for beer making) ($5 million), edible fats and oils ($2.6 million) and cotton ($2.7 million). These totaled only 7 percent of Malawi's imports that year. Thus, it appears that there is no great scope for import substitution for Malawi in the near future. Malawi's planners appear alert to import substitution possibilities and no doubt will take advantage of them as they

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[1] Area Handbook for Malawi, p. 115.

come along, particularly if they can obtain the donor support.

b. Prices of imports vs. domestic prodution costs

Malawi would not import the goods she does if she could produce them cheaper herself. Relative prices between imports and domestic products would move in favor of domestic products if Malawi were to devaluate her currency. But such a move has many ramifications, not all beneficial, and is certainly not suggested here. Malawi has protective duties on clothing, textiles, beer and spirits, resulting in some import substitution for these items (IMF reports).

C. Potential for Exports

1. Existing Exports

a. Historical trends

Malawi has had great success exporting agricultural products in recent years. Export earnings from agricultural products between 1973 and 1977 expanded from $82 million to $203 million, or 147 percent. The biggest expansion in sales was from tobacco, tea, sugar, and peanuts, but was due primarily to higher prices. Corn exports have declined to zero over the past three years and cassava exports nearly have as well. Cotton export earnings have stagnated.

b. International prices vs. actual domestic production costs

Measuring agricultural production costs is difficult. Problems are encountered in measuring joint cost in production and the cost of labor and land. Most labor is supplied by the family which has few good alternative employment opportunities in a country that is 90 percent agricultural. The price of land

depends upon the value of the product so its cost determination is circular. The best measure of comparative advantage is to see which crops in fact prove most profitable in practice, the ones that are grown most and exported most. These have already been discussed.

c. Distortions created by government policies

The biggest price distortions created by government for agricultural products in Malawi are probably those for fire-cured tobacco (smallholder), cotton, confection peanuts, and corn. Prices of smallholder tobacco are kept low, both to make a large export profit and to keep from over stimulating fire-cured tobacco production. The world market for it is thin and foreign buyers have asked Malawi to keep production in check. Cotton prices are artificially low, in part to keep domestic textile prices down. Confection peanuts are a good source of profit and export earnings for the government. It is not clear how much corn prices are distorted. The Government has not exported any for three years because there is no exportable surplus at their low offer prices. The Government has reportedly exported rice at a loss in some years to earn foreign exchange.

d. Capability of expanding output at undistorted prices

Several Government economists told the interviewers that they felt cotton production would expand significantly if growers were offered more reasonable prices. Smallholder tobacco production would no doubt greatly expand if allowed to. Low corn prices are often blamed for the lack of expansion in the production of this crop, but it is not clear how much effect

the Government's low buying prices have on the average price received by farmers. Confection peanut production would no doubt expand if ADMARC passed more of its value back to producers, but its supply elasticity is difficult to estimate.

2. Potential New Exports

Malawi has been quite successful in expanding her agricultural exports. Her greatest future in agricultural export expansion lies in expanding exports of her traditional crops. Sugar exports can be expected to increase sharply in the near future when the new mill and estate come into production. Tea exports are doing well and it appears coffee has some potential. The principal source of growth in exports for some time to come will be flue-cured and burley tobacco, unless Rhodesia (Zimbabwe) becomes a major factor again. There is interest in silk production, but this will take time to develop. Malawi is planning a $350 million wood pulp mill that will produce exclusively for export. Foreign financing is being sought.

D. Supply and Demand Projections (1978-1988)

1. Foodcrops and other Food Commodities

a. Domestic markets

Domestic food crop demand will grow with growth in population (2.9% per year) and income (4.1% per year). Since at least one-half of personal income in Malawi is spent on food, the annual increase in the quantity of food demanded will be about 5 percent per year, more for food items with a high income elasticity of demand (meat, sugar, rice) and less for food items with a low income elasticity of demand (corn, cassava,

sorghum).

The domestic supply of food crops is difficult to project. Malawi has not made an official crop production estimate since 1973 so the trends in production are not well known. It is clear, however, that domestic demand is catching up with the domestic supply of corn and cassava as their exports, once strong, are now negligible. Rice exports fluctuate sharply and peas and beans exports may be on a downward trend. Historically, Malawi has increased food production by increasing her acreage under cultivation. But now that the supply of good, unused, arable land is about exhausted, future increases in supply will have to come from increases in yields. Increasing crop yields throughout Malawi is the primary objective of the new National Rural Development Program (NRDP). Its potential appears good. It is discussed in the next section of this report.

Livestock production is increasing in Malawi and meat imports no longer appear necessary. The cattle herd is increasing 5 percent per year, about the rate of demand increase. The slaughter rate of the herd is 10 percent. Pork, poultry and egg production, largely in the estate sector, are at the point of market saturation. More can be produced when the demand is there. Fish production has plateaued, but it is hoped it will increase as research on the biology of Lake Malawi and investments in aquiculture pay off.

b. Export market

Export demand for most of Malawi's food crops should remain fairly strong. Malawi's exports are so small

compared to the world total that they don't significantly affect world prices. World food production has been increasing faster than world population, but the excess has been absorbed by increased demand stemming from higher incomes and improved diets (largely increased animal products). The ability of the world to continue to feed itself so well in the face of its population doubling every 35 years is one of the major world concerns. Malawi enjoys favorable trade relations with RSA, Commonwealth countries and the European community.

Malawi's ability to export food crops appears mixed. She is hindered by her relatively poor access to the sea and perhaps an over valued exchange rate (at least a lower rate would help agricultural exports). Her corn and cassava exports have practically disappeared. Rice exports are erratic, but could be expanded with improvements and expansion in irrigation. Sugar exports, however, have grown dramatically and will increase even more when the new estate and factory are completed. Confection peanut exports could be expanded if yields could be increased (the yield drop in the Central Plateau has agronomists perplexed) and a mechanized sheller developed for these irregular nuts. The export supply of most of Malawi's export food crops, however, will increase if the NPDP and related programs are successful.

2. Cash Crops and Other Non-Food Commodities

a. Domestic markets

Malawi's main non-food cash crops are tobacco, tea, and cotton. The domestic market takes relatively little tobacco or tea, leaving the bulk for export. Only about 10 percent of

Malawi's cotton lint is exported and, if production doesn't start expanding, this will soon be absorbed by the domestic market.

The export market for tobacco and tea have been strong, as reflected in the higher prices received. Malawi has done a good job in expanding production of these profitable items and should remain competitive in the world market.

V. STRATEGY FOR DEVELOPMENT

As stated in the introduction, the level of agricultural production in a country is a function of the quantity and quality of the resource base and how effectively these resources are allocated. Increases in the resource base are largely a result of various short and long run investments. The allocation question is directly related to the effectiveness of the management decisions supported by economic and cultural incentives to produce.

The paper, to this point, has been a discussion of the current situation in Malawi and the major constraints to reaching its goal of increasing agricultural production and income in the rural areas.

The objective of this section is the delineation of a potential development strategy to help Malawi reach its agricultural objectives. The strategy is based on various facts presented in the first three sections of this report and some in this section concerning Malawi's economic, political, resource and government service environment, both now and in 15 years in the future. The basic facts and assumptions on which this strategy is based are classified and outlined below.

A. Basic Facts and Assumptions

1. Economic Environment

a. The Malawi Government will continue to promote free enterprise and follow conservative monetary and fiscal policies.

b. Malawi's population of 5.6 million will continue to grow 2.5-3.0 percent per year for at least a generation at which time it will be double its present level. This will reduce per capita land availability by one-half and necessitate the creation of many more agricultural jobs.

c. Malawi's gross domestic product (GDP) will continue to grow about 4 percent per year.

d. Malawi will continue to be basically an agricultural country, relying primarily on agricultural exports for foreign exchange and growth and will be expanding production of light industrial goods in substitution for imports.

e. The Malawi Government, though free enterprise oriented in production, will continue to rely heavily on ADMARC for marketing agricultural products and inputs, developing agricultural resources, and providing revenue to the Government.

f. Smallholders will continue to produce the bulk of food crops and estates will continue producing the bulk of cash and export crops.

g. The Malawi Government will continue to encourage foreign assistance and foreign assistance will continue to flow into the country, and absorbative capacity will continue to be a problem. Donors often insist on Malawi handling the recurrent costs of their projects. The recurrent costs to Malawi of many new projects can become unduly burdensome.

h. The Malawi Government will continue actively to promote agricultural development, relying primarily upon its National Rural Development Program.

2. Political Environment

a. Malawi will continue on an independent political course and will continue to recognize and trade with RSA.

b. Malawi's neighbors will not cut off her access to the sea.

c. There will be a peaceful settlement in Rhodesia (Zimbabwe), but it will be some time before trade flows between the two countries get back to previous levels (see Appendix F).

3. Agricultural Resource Environment

a. Land

i. Malawi has a basically favorable agricultural land base and climate, but is getting close to the limit of unused arable land and thus will have to rely increasingly on increases in crop yields to expand agricultural production.

ii. Most of Malawi's remainining unused arable land is in remote areas and may require resettlement schemes to be developed.

iii. There is abundant surface water in some areas (Lake Malawi and the Shire River), but a general shortage of ground water due to a lack of aquifers.

iv. There is good potential for expanding irrigation along Lake Malawi and the Shire River, but not much potential anywhere else except from artificial ponds.

v. Though good by tropical standards, Malawi's soils are generally weak in minerals and will require increasing quantities of fertilizer to keep them productive.

vi. Malawi has good fish resources, but some areas are over fished and little is known about the potential of other

areas, particularly the upper (and deep) part of Lake Malawi.

vii. Malawi has good potential for aquaculture. The climate is good and many ponds are already available. Considerable training, however, will be required.

viii. Malawi has good forestry potential and a great need for forestry products (fuel, poles, lumber, pulp), but her forestry resources need conservation and development.

ix. Malawi has some good wildlife habitats, but they must be protected to be preserved.

x. Erosion is a problem in many areas.

b. Labor

i. There will be an abundance of agricultural labor. A doubling of population in the next 25-30 years will, in fact, create a surplus of agricultural workers for the present land base. These workers must be absorbed by either intensifying agriculture or expanding industrial and service employment. The demand for labor in RSA's mines will not likely expand.

ii. There is a great need for manpower training at all levels from agricultural worker to university professor. Only 25 percent of the population is literate, but the proportion will increase as more enter primary schools.

Farmers need more extension contacts and there is a great shortage of TA's, TO's and professional and super grade workers in government. Business needs more trained people as well. Lack of sufficient trained manpower is one of the most limiting factors to Malawi's development.

iii. Smallholders will shift more into estate type crops as they develop the necessary skills.

4. Management and Incentives Environment

Malawi farmers are basically economic men, but do not have as high aspirations perhaps as farmers in some countries and their incentives to produce and profit are dampened by several factors:

a. They must by custom share their wealth with their extended families.

b. If they attain high yields, a sizable proportion of their neighbors will think it is due to witchcraft.

c. They (smallholders) do not have free title to their land and they cannot mortgage, buy, or sell land.

d. They prefer the taste of the traditional varieties of food crops over the high yielding varieties. The traditional varieties also generally store better than new varieties.

e. They are often so close to the margin of subsistence that they are averse to taking risks on new crops or on debt.

f. They receive relatively low prices for their crops and pay relatively high prices for their inputs due to government policy and their remoteness from foreign markets.

g. They consider cattle a status symbol and a store house of wealth and thus are reluctant to sell any.

h. There are few consumer goods in the villages and market towns to serve as an incentive for farmers to strive to acquire them.

5. Capital Environment

Malawi is generally short of savings, thus interest

rates are high and will generally remain so. This tends to dampen investment. In addition, the following problems are prevalent:

a. Government credit for farmers will become even more important than in the past.

b. Farmers will continue to have low savings, which will dampen their ability to invest and take risks.

c. The need for high yielding varieties of seeds and a complementary package of inputs will grow as the need to increase yields increases. The seeds and other inputs need to be based on quality research under Malawi conditions.

d. Cattle numbers will continue to grow, but the animals will continue to be plagued by serious diseases which must be controlled to have a viable industry.

e. The supply of poultry, eggs, and pork will continue to keep up with demand.

f. Ox plowing can reduce drudgery and increase yields and output per worker. It can be expanded at little extra cost once farmers are trained in their use. There are plenty of cattle to be trained.

g. The rural areas are lacking in infrastructure. Except in the four project areas, there is a great need for feeder roads, more permanent markets, improved wells, and terracing. Some of this infrastructure will be provided by foreign donors as part of NRDP.

6. Government Services Environment

The Ministry of Agriculture and Natural Resources is highly motivated, but under trained and under staffed at nearly all levels and in all branches (See Appendix D). This

reduces their effectiveness below their potential and limits their capacity to absorb foreign aid. The GOM plans that the sizable number of expatriates in MANR (mainly at the higher levels) will be reduced as more Malawians become qualified to take their places. This objective will be difficult to achieve since government workers are generally underpaid compared to private industry which is able to hire many of the best of them anyway. Further, there is a dearth of basic data on Malawi's agriculture. There has not been an official estimate on non-estate crop production since 1973.

B. Proposed Strategy for Development

1. Basic Approach

The basic strategy for agricultural development in Malawi or any country is to remove the constraints on agricultural development. Malawi's agricultural development, as noted, has many constraints, some more critical and some more easily removed than others. Rationally, development planners should spend resources on removing constraints until the last dollar (or other currency) spent on removing each makes the same contribution to development, but not beyond the point where these contributions are less than their cost.

2. Main Constraints

Judging from observations, interviews, and analysis of available data, it appears the main constraints to Malawi's agricultural development on which government programs have the most leverage are: (a) low manpower skills, (b) an inadequate package of agricultural inputs and cultural practices resulting from an underdeveloped agricultural research program, (c) low farmer incentives to invest in productive inputs and management practices, (d) weak rural infrastructure, (e) depletion of natural resources, and (f) underdeveloped fisheries. There is also a need for greater equity in the right to grow profitable cash crops. These restraints can be largely removed with concerted action and sufficient resources. Their removal will take time, thus the proposed strategy is a long range one. The elements of this proposed strategy are outlined below.

3. Elements of the Proposed Strategy

a. Manpower Training

Low manpower skills of many farmers and a shortage of qualified researchers, teachers, and civil servants appear to be the main constraint to Malawi's agricultural development. These deficiencies need to be overcome with an expanded and upgraded extension staff and farmers training centers, and higher levels of training for more teachers, researchers, and civil servants. Most of the later training needs can be met by expanding and upgrading Malawi's agricultural schools, both degree and certificate granting. There is also a great need for more foreign scholarships for those requiring post graduate training, such as some teachers, researchers, and higher level civil servants. See Appendix D for a discussion of Malawi's manpower training needs and approaches to supplying them.

b. Agricultural Research

Malawi farmers need a good productive package of seeds, inputs, and management practices if they are to expand production on their farms to their potential. There must be continuous breeding of new varieties and development of disease control methods to increase yields and stay ahead of new plant diseases. Research is also needed to upgrade the country's livestock herds and increase their productivity through improved nutrition, breeding, and disease control. Research, likewise, is needed to improve returns in fisheries and forestry. Upgrading Malawi's agricultural research program will require a sizable investment in training, facilities, and operating costs.

c. Farmer Incentives

Lack of sufficient farmer incentives is a major hurdle to increasing farmer investments in crops and livestock. Some of their disincentives are cultural and not much can be done to remove them. The farmer's most easily changed incentives are the prices he pays for his inputs and receives for his products. ADMARC could contribute greatly in both areas by passing more of its earnings back to the farmer and acting less as a tax collector.

The farmer's incentive to produce would also be increased by providing him more credit. Most farmers have little savings to invest in modern inputs. Lilongwe Land Development Project (LLDP) farmers have been quick to use the credit offered them and have a good repayment record. The program should be expanded to other areas as funds allow.

The Government's program of honoring progressive farmers (Achikumbi) seems a good approach to providing incentives and dispelling the idea that high yields come from witchcraft. LLDP's land registration program (giving families title to their land) is also a good approach to increasing incentives and should be expanded.

d. Rural Infrastructure

Malawi's four major agricultural development projects include only about one-fourth of the nation's farmers. Areas outside the projects are generally lacking in feeder roads, permanent market centers, health clinics, drilled wells, and terracing. These infrastructure elements are needed if

farmers there are to participate more actively in the market economy.

e. Resource Conservation

Malawi has abundant natural resources that must be conserved and rationally used if she is to maximize her welfare from them. Fish provide 75 percent of Malawi's meat supply, yet there is danger of over fishing some areas such as the southern arms of Lake Malawi, while other fisheries such as the northern reaches of Lake Malawi go unexploited for lack of knowhow and equipment.

Wood is the primary fuel for cooking and drying tobacco and is an important building material in Malawi. Malawi has numerous forest areas, but the supply of wood is dwindling due to a lack of protection, conservation and a shortage of trained foresters. Reserves, protected from livestock, are badly needed in populated areas to provide convenient sources of fuel wood there. There is a great potential for developing a pulp industry in the northern region and for exploiting high valued cedars on Mt. Mulanje, but the job will not be done properly without adequate forestry training and resources.

Lake Malawi is one of the largest and deepest fresh water lakes in the world. Relatively little is known about the biology of its deeper areas or the potential impact the Viphya paper mill will have on its flora and fauna. Research is needed on these important matters.

Malawi is fortunate yet to have some good big game

wildlife habitats. Without adequate protection and management the wildlife in these areas will be lost to Malawi and the world. The development and protection of these wildlife habitats would be a worthy international project. Once the habitats and game are gone they will be nearly impossible to replace.

f. Fisheries Development

As noted, fish provides 75 percent of Malawi's meat supply. Any food source this important deserves considerable government attention. Support is needed to learn more about the biology of the fisheries, particularly the highly prized and abundant Chambo; the best conservation methods; and the best methods and species to use in aquaculture. Once this research is completed, technical assistants and officers will need to be trained to regulate the industry and teach fishermen the best fishing techniques.[1]

g. Estate Crops for Smallholders

Malawi's main export crops, sugar, tea, and flue-cured and burley tobacco are produced almost exclusively in the estate sector. There are schemes to train smallholders to grow these crops. These should be rapidly developed to provide more jobs for the fast growing farm population and to increase their incomes. The present dual economy may have been necessary to get agricultural development started in some

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[1]See Appendix A for consultant's comments on Malawi's fisheries and Fishery Department.

areas, but it should not continue too long for the sake of equity.

C. Implications of Strategy for Foreign Aid Donors

Those designing an agricultural development strategy and plan for an aid recipient country should consider the country's ongoing and future domestic and donor supported programs and plans. These should be examined for conflict and complementarity with the proposed strategy and plan and for an indication of what the host country sees as high priority areas.

Malawi has enjoyed the support of many foreign aid donors, particularly the United Kingdom and the World Bank. Malawi officials and donors have recently developed a long range, integrated plan that encompasses several ideas expressed in the strategy outline above. Their plan, called National Rural Development Program (NRDP), is basically a phased expansion of the four original intensive area projects to cover the whole country in 15-20 years, but less intensively than under the original four area projects.[1] The program stresses minimum capital investment and project elements with relatively immediate impact as demonstrated in the earlier projects. Emphasis is on providing improved high yielding crop varieties and related cultural practices, ex-

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[1] NRDP is outlined in Appendix E. It is more fully described in Malawi Government, National Rural Development Programme, Policies, Strategy and General Features, MANR, 1977.

tension education, rural credit, inputs and market services, and a basic rural road network. NRDP is estimated to cost $13.00 per acre or $26.50 per person over 17 years.

In addition to the area programs, NRDP includes an expanson of some central agricultural services, such as planning, agro-economic surveys, land resource surveys, a national sample survey of agriculture, central research, district research trials, meteorological data collection, staff training, accounting and other technical staff support, a construction unit, and credit. USAID has been approached to finance the research component of NRDP and negotiations are currently underway on this matter.[1]

NRDP is a well planned program for promoting agricultural development in Malawi and the Malawi Government is to be commended for it. It covers fairly well the extension training component of element (a) of the strategy proposed in this report and it specifically addresses the need for agricultural research found in element (d). As broad as NRDP is, it does not cover several of the other elements of the suggested startegy developed in this paper. In particular, it is weak in manpower training outside NRDP and it does not tackle several aspects of farmer incentives, particularly ADMARC's returning a larger share of its earning to growers. It addresses forestry development but generally ignores the need

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[1] The proposal for USAID to support Malawi's agricultural research was well developed. It is found in Malawi Government, National Rural Development Programme, 1979/80-1983/84 Agricultural Research Proposals Submitted to USAID, Dec., 1977.

for conservation and development of water, wildlife, and fishery resources and the development of aquaculture. Neither does it include a specific scheme for moving smallholders more rapidly into estate crops. These types of programs should be developed when the Malawi Government and its aid donors have the resources to implement them. Probably the biggest obstacle to taking them up will be Malawi's absorbative capacity for new foreign aid.

Development strategies, of course, have to be broken down into specific implementable programs and projects to be made operational. In the process of looking for possible specific projects to implement the strategy developed here, the study team interviewed numerous government officials to see what they felt were Malawi's most pressing project needs in the strategy areas. For the most part, but not always, they replied in terms of their own areas of responsibilities. Their responses are itemized in Table 8 below. One of the interesting things about their responses was the frequency with which they mentioned the need for training of one type or another. This supports the importance of the first element of the proposed agricultural development strategy.

The second greatest felt need of MANR officials was for support to carry out and expand their individual programs. They have many project and program ideas on the books but lack the resources to implement them. Of the projects listed in Table 8, it appears the fisheries projects should be given particularly high priority.

Table 3.--Development projects suggested by MANR officials for donor support, by subject matter area, 1978

Irrigation Projects

1. Water management training center for farmers.
2. Construction of a 16 mile irrigation canal.
3. Training school for irrigation personnel.
4. Construction of several small dams on local rivers.

Hydrology Projects

1. Water resource assessment of Lake Malawi.
2. Advancement of hydrological services in Malawi.
3. Measurement of sediment and water quality.
4. Regional and district construction programs to manage sediment and water quality measurement.
5. One year's course abroad for senior technical officers. Lack of professional staff was considered the Department's major constraint.
6. Resources to monitor lake pollution from planned pulp mill.

Forestry Projects

1. A forestry extension program to encourage development of wood lots. Wood is the principal domestic fuel used in Malawi and the supply is dwindling. Considerable wood is also needed for curing tobacco, the source of over one-half of Malawi's export earnings.
2. Soil research equipment for research institute.
3. Training to improve skill of forest labor force. Training school needs laboratories, workshops, vehicles, wells, and busses.
4. Scholarships for training at a U.S. forestry college.
5. Construction of vital 10-mile road to Mt. Mulanje.

Veterinary Service and Animal Health and Industry Projects

1. Animal quarantine and meat hygiene program.
2. Upgrade animal industry in-service training at Mikolongwe for farmers and technical assistants.
3. Tick control program for small holder dairy scheme.
4. Small holder beef and dairy production scheme.

Table 8.--continued

Veterinary Service and Animal Health and Industry Projects (continued)

5. Rabies control program.
6. Scholarships for training DVM's.
7. Two U.S. veterinarians to assist the Department in its duties.

Fisheries Projects[1]

1. Chambo research project. What is the maximum sustainable yield and how to attain it?
2. Fish farming (aquaculture) extension project. Teach farmers aquaculture.
3. Provide fisheries research facilities in north Lake Malawi. Equipment is needed for study of commercial fishing prospects in the northern part of the lake.
4. Small boat building. Train boat makers to build better fishing boats.

National Parks and Wildlife Projects

1. Conservation of wildlife resources. The objective of this proposed project is to provide the necessary infrastructure and staff to adequately protect the resources of each park and game reserve and to develop appropriate areas for visitor use consistent with the preservation of each area. The cost of this project is projected at over $1 million.
2. Train more indigenous manpower for the Department's programs.
3. Development of Lilongwe nature sanctuary.

Agricultural Research Projects

These projects are fully outlined in Malawi Government, NRDP Agricultural Research Proposals, December, 1977. See discussion above under NRDP research component.

Table 8.--continued

Extension Aids Projects

1. Foreign training for some staff members in the writing and publishing of extension materials.
2. Training on radio program production.

Land Husbandry Projects

1. U.S. training for staff members on remote sensing.
2. Remote sensing transfer equipment.
3. Expand land husbandry training facility at Zomba including classroom and boarding facilities and hostel for graduate courses.
4. Soil research team to map Malawi soils using American system.
5. Soil correlation studies.

Bunda College of Agriculture
(Diploma and Degree)

1. Student hostel.
2. Post-graduate training program. It now only offers training up to the bachelor's degree.
3. Initiate degree programs in the following areas:
   (a) Forestry
   (b) Home economics and human nutrition
   (c) Soil surveys and land planning
   (d) Fisheries
4. Supply more foreign consultants.
5. Develop an agricultural research program.
6. Expand facilities and faculty to handle 380 students, rather than the present 240.

Storage Projects

1. Build silo storage for the national grain reserve. Its cost is estimated at $8-10 million.

Agro-Economic Survey Projects

1. Scholarships for 1-2 people per year for training abroad. Foreign fellowships cost about $1,100 per month.

Table 8.--continued

Colby and National Resources College (Two-year college for technical assistants)
1. Training for faculty (20) beyond B.Sc.
2. Topping off salaries for more foreign faculty.
3. Textbooks.
4. Wood treatment plant.
5. Extend training period for technical assistants to four years.
ARMARC
1. Team of staff economists

SOURCE: Interviews with MANR officials. Not all projects are officially approved. Several reflect thinking of individuals in MANR, not all necessarily in the departments that would be involved.

[1] The SECID fisheries consultant's favorable evaluation of these four projects is found in Appendix A

D. Summary and Conclusions

Malawi is a relatively poor agricultural country with little mineral wealth and a low industrial base. Its population (5.6 million), one of the densest in sub-Sahara Africa, is growing rapidly (2.9% per year) and she, therefore, must place a high priority on expanding agricultural production, particularly by increasing crop yields on her limited land base. It appears the most efficient and perhaps equitable approach to this is to upgrade her manpower skills; give farmers more incentives to invest in good agricultural inputs; conserve and rationally use the good natural resources she has in forestry, land, water, fish and wildlife; develop her aquaculture potential and bring more smallholders into estate crops as a matter of equity. Such a strategy should enable Malawi to feed its growing population and absorb more of them productively in agriculture. Increases in agricultural production can also provide the foreign exchange required to develop a much needed industrial base.

To follow this basic strategy, Malawi will need considerable outside aid, but judging by the past and the quality of Malawi's planning, the aid would be well spent.

APPENDIX A

MEMORANDUM ON FISHERIES PROJECTS

MEMORANDUM July 13, 1978

To: John Moore, Malawi Agricultural Sector Team Coordinator

From: John H. Grover, Auburn University

Re: Malawi Potential for Fisheries Assistance

Malawi is a small, land-locked country which, in spite of its location, has 20 percent of its area occupied by water. Fish captured from these inland waters provide 75 percent of the animal protein in the Malawian diet. The average annual consumption of fish is 40 pounds per person which is only 60 percent of the WHO recommended quantity of animal protein intake. Exports of ornamental fishes, particularly the colorful chichlids from the diverse fauna of Lake Malawi, bring in about a quarter of a million dollars export earnings to the country each year. Under these circumstances it is most appropriate to address the needs of the fishery resources in any development planning.

The Fisheries Department in the Ministry of Agriculture has developed four proposals in their planning for which they would welcome foreign assistance. I find the proposals reasonable and a reflection of an overall resource management plan that is rare among the less developed world. The homework to justify serious project support has been done. It is most clear that lack of financial resources is keenly felt in all the Fisheries Department activities. For example, the only microscope at the main research center for Lake Malawi at Monkey Bay belongs to one of the expatriate staff, purchased from personal funds because government support would not afford one. The Government of Malawi is serious about maintaining their fisheries resources but could do a better job with more effort and support through all phases from education and training through research design, investment financing, etc.

Ultimately, it must be recognized that the lake fishery resources are finite and only so many more fish can be taken on a sustained basis. Careful, research based, management will be needed to sustain high levels of harvest at efficient costs. In turn, the scene is set for a significant push to develop on-farm aquaculture as a new and yet little practiced agricultural activity. The systems have been devised, albeit crudely, and even pilot extension demonstrations have been made. Support to continue the applied research and extension efforts in aquaculture should result in more fish at low cost to poor rural people.

APPENDIX B

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE
OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

Agency	Name	Title/Department
Agricultural Development and Marketing Corporation (ADMARC)	Mr. Nsusa	Regional Manager
	Mr. Salifu	Administrative Manager
Bunda College	Dr. David Green	Lecturer
	Mr. Edward Knapp	Lecturer
	Dr. Lungu	Principal
Chitedze Agricultural Research Center	Mr. Mkamanga	Principle Research Officer
Colby College	Mr. John Houston	Lecturer
	Mr. B. Maibo	Deputy Principal
	Mr. Francis Mbuka	Principal
	Mr. Nunly	Lecturer
Employment Bureau of Africa, Ltd.	Major Ted Rickett	Representative

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

Agency	Name	Title/Department
Food and Agriculture Organization of the United Nations	Mr. Ian Beale	Livestock Specialist
	Mr. Joeris	Advisor, Fisheries Department
	Mr. Peter Jones	Advisor, Irrigation Department
Lilongwe Land Development Project	Mr. Atkins	Evaluation Officer
	Mr. Tony Standen	Director
Ministry of Agriculture and Natural Resources	Mr. David Anstey	Principle Game Warden, Department of National Parks and Wildlife
	Mr. S. R. Bleazard	Department of National Parks and Wildlife
	Mr. Peter Brown	Deputy Secretary of Agriculture
	Mr. Enoch Chinganda	Director, Agricultural Economics Survey
	Mr. Gilbert Chirwa	Senior Marketing Economist, Planning Unit
	Mr. S. D. Chirwa	Deputy Secretary for Agriculture
	Mr. W. W. Chirwa	Chief, Agricultural Development

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE
OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

Agency	Name	Title/Department
Ministry of Agriculture and Natural Resources (continued)	Mr. E. Kendall Clark	Agriculture Development Officer
	Mr. Devonish	Forestry Department
	Mr. Robert Drayton	Department of Hydrology
	Mr. Duggal	Director, Irrigation Department
	Mr. Stanley Kamanga	Senior Planning Officer, Planning Unit
	Dr. Kamvazina	Veterinary Services
	Mr. Kanguade	Extension Training
	Mr. P. P. Lakshmanan	Principal Economist, Planning Unit
	Mr. Lipato	Chief Veterinary Officer
	Mr. John Loggi	Forestry Department
	Mr. Roy Manda	Research Director
	Mr. Nick Mandville	Principal Hydrologist
	Mr. Mangame	Principal Officer, Land Husbandry
	Mr. Mannelstien	Marketing and Farm Inputs
	Mr. Masangano	Extension Crops

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

Agency	Name	Title/Department
Ministry of Agriculture and Natural Resources (continued)	Mr. Mathoto	Director, Fisheries Department
	Mr. David May	Forestry Department
	Mr. Mkzuma	Fisheries Department
	Mr. A. J. P. Mzumara	Senior Fisheries Officer
	Mr. Ndovi	Forestry Department
	Mr. J. K. Nyasula	Assistant Agr. Extension Aids Officer
	Mr. Richards	Agro-Econ Survey
	Mr. Rod Roeske	Department of Hydrology
	Mr. F. H. Sikwese	Senior Economist for Projects, Planning Unit
	Mr. Jeff Ryler	Economist, Planning Unit
Ministry of Finance	Mr. C. Mponde	Economist
United Nations Development Program	Mr. Otto Jannone	UNDP Resident Representative
United States Embassy, Malawi	Mr. Gilbert Scheinbaum	Deputy Chief of Mission
	Mr. James Wilson	Economic Attaché

PARTIAL LIST OF PEOPLE INTERVIEWED BY SECID TEAM IN COURSE
OF MALAWI AGRICULTURAL SECTOR ASSESSMENT

Agency	Name	Title/Department
United States Embassy, South Africa	Mr. C. H. Germishuis	Staff of U.S. Agr. Attaché
	Dr. J. O. Howard	U. S. Agricultural Attaché
World Bank	Mr. Wolf	Education Specialist

APPENDIX C

AGRICULTURAL PRODUCTION OPPORTUNITIES

AGRICULTURAL PRODUCTION OPPORTUNITIES

There are good opportunities for increasing the yields of Malawi's major crops. Shifting from unimproved to improved production techniques can increase yields from 43 to 222 percent depending upon the crop (Table 9). A discussion of production opportunities for individual crops and for livestock follows.

Corn (Maize)

Corn is by far Malawi's most important crop. It is grown on 85 percent of the land (95 percent in some areas) and is the staple of the diet. Three types of corn are grown, all white. They are the hybrids, composites, and the unimproved open pollinated varieties. The latter, though lowest yielding, are by far the most improtant in terms of acreage and volume (Table 10). Hybrids and composites have

Table 9.--Malawi: Yields per acre for selected crops using unimproved and improved farming techniques

	With Unimproved Farming Techniques	With Improved Farming Techniques	Percent Increase
	(lbs./acre)		
Maize	1,200	3,000	150
Groundnuts	400	790	98
Fire-cured Tobacco	250	490	96
Flue-cured Tobacco	--	1,250[a]	--
Burley	700	1,000	43
Cotton	450	880	96
Rice (Irrigated)	--	3,500[c]	--
Rice (Rainfed)	1,500[b]	2,500[d]	67
Cassava	900	2,900	222
Pulses	300	650	117

SOURCE: Ministry of Agriculture and Natural Resources, National Rural Development Programme, Policies Strategy and General Features, 1977

[a]Large scale farmers and smallholders.

[b]Rainfed rice.

[c]Irrigated rice.

[d]Improved rainfed rice.

been promoted especially in the project areas but have not been taken up as rapidly as hoped due in part to the higher cost of seed and fertilizer required and the preferred taste and better keeping (less subject to weevil) and pounding (milling) qualities of the traditional varieties. The most popular hybrid corn variety is SR-52. It was developed in and formerly imported from Rhodesia but is not produced locally.

Table 10--Malawi: Yields of shelled maize

	Double Hybrid	Composites, Synthetics, etc.	Unimproved Seeds
	(kg/ha)		
With fertilizer			
Research results	7,000	4,500	2,800
Farmer results	4,000	2,200	1,500
No fertilizer			
Farmer results	---	1,300	1,000

SOURCE: World Bank, Malawi - Agricultural Section Review, 1973

Malawi farmers produce about 1.2 million metric tons of corn each year. Most is consumed in the village of production. About 100,000 metric tons is marketed by small holders outside of ADMARC. It is Government policy to hold about 80,000 metric tons (7 percent of production) in reserve though this goal is seldom reached. The Government is

currently considering increasing its reserve to 10 percent of production and some of it in silos.

Peanuts

Peanuts (groundnuts) is Malawi's second largest crop in area and production. It is an excellent crop for the country as yields are relatively good and peanuts provide needed protein and fat in the diet. Most of the crop (65 percent) is consumed by producers or in the village while the remainder is marketed either privately or through ADMARC. Some of the latter is sold for crushing to vegetable oil mills in Blantyne while 25-30,000 tons is exported as confection nuts. This is the Chalimbana variety which brings a good price but requires laborous hand shelling. A mechanized sheller has not yet been developed to handle these large irregular nuts without breaking an unacceptable large number.

Peanut production and marketing have been somewhat disappointing. Production and yields have stagnated and marketings through ADMARC have declined. Production has leveled off in part due to the increasing profitability and popularity of tobacco. The reason for a deline in yields in the Central plateau is not clear. Peanut marketings through ADMARC have declined in part because of higher prices being offered by private buyers. Peanut production in some areas is seriously affected by rosette disease.

Pulses

Pulses (beans and peas) provide an important source of protein for Malawi consumers and historically have been an important export item, particularly the white harricot and sugar beans. Unfortunately, per capita production is declining and exports are down to one-fourth their level of the late 1960's. Prices paid by ADMARC apparently are not attractive to farmers and the plants are subject to attack by the bean fly. The most effective insecticide for the bean fly has been banned. Average yields could be increased considerably by denser plant populations, pure stands, improved cultural practices and fertilizer. Soybeans have been tried but don't appear attractive at this time.

Cassava

Cassava is an important energy food in Malawi. It is both hardy and drought resistant. Farmers grow it more for its reliability and storability than for its taste. Cassava in Malawi is produced mainly for home consumption but also for the fresh market and for export as animal feed to Europe after being dryed, peeled and chipped. Returns in the export market have been low in recent years in part due to the difficulty of exporting through Mozambique's over-taxed transport system. As a result cassava exports have dropped sharply, from 28,000 tons in 1972 to 300 tons in 1976. Though generally hardy, the crop suffers from some diseases and resistant varieties are being sought. Farmers

can triple their yields using improved cultivation techniques.

Tobacco

Tobacco is Malawi's leading cash crop and export (51 percent). Since its introduction into Malawi in 1920 the area planted has expanded to 151,000 acres. In 1977, 113 million pounds were sold at auction at an average price of $.95 per pound. This earned Malawi $107 million in foreign exchange (Table 11).

Malawi produces five basic types of tobacco. In decreasing order of auction value in 1977 they are: fire-cured ($43 million), flue-cured ($41 million), burley ($17 million), sun-air ($6 million), and oriental (less than $1 million). Flue-cured and burley are primarily produced in the estate sector while the rest are produced primarily in the small holder sector. Estate tobacco is sold directly at auction to foreign buyers. Small holders must sell their tobacco to ADMARC which regrades and packs it and sells it at auction to foreign buyers, often at a substantial profit.

The future for tobacco in Malawi is bright. Malawi's relatively low wage rate and favorable climate and soils make the country competitive in this labor intensive industry and production has been increasing rapidly.

Malawi's tobacco export market looks relatively good. The Rhodesian situation has created some slack in

Table 11--Malawi: Area planted, quantity produced, auction price and sales volume of tobacco by type, 1976 and 1977

Type	Area Planted	Auction Sales					
		Quantity		Price[a]		Value[a]	
	1976	1976	1977	1976	1977	1976	1977
	(000 acres)	(million lbs.)		(¢/pound)		($ million)	
Fire-cured	77	27	41	96	106	26	43
Sun-air	19	4	6	96	98	4	6
Flue-cured	32	36	43	80	94	29	41
Burley	22	15	22	56	74	8	17
Oriental	1	0.6	N/A	26	N/A	0.1	N/A
TOTAL	151	82	113	82	95	66	107

SOURCE: The Tobacco Control Commission.

[a]Converted at the rate of MK 1 = $1.20.

the world flue-cured market and Malawi's signing of the Lomé convention will help with access to the European market.

Malawi's yields, especially in the small holder sector, could be greatly increased with improved cultural practices and additional fertilizer. Fire wood for curing is becoming a constraint on production in some areas.

Rice

Malawi farmers sell about 25,000 MT of paddy to ADMARC each year--about one-half of which is exported as rice. The main paddy producing areas in Malawi are along the western shore of Lake Malawi. Rice projects in this area have been supported by China (Taiwan), Israel and the Federal Republic of West Germany.

Short term rice exports do not appear too promising due to the bleak world market. Malawi, however, enjoys a preference in the South African rice market and supplies some rice to Zambia.

The longer term prospects for rice in Malawi appear promising. Some farmers have achieved yields of 3,500 pounds per acre and more will as they plant more high yielding varieties and use more fertilizer. Domestic demand will strengthen with increased population and income.

Cotton

Malawi produces a good quality medium-to-long staple cotton that has good export and domestic demand. Annual purchases of seed cotton by ADMARC, the monopoly buyer,

have been between 19,000 and 25,000 tons. Most of it is produced in the Lower Shire and Salima projects. Production is fairly erratic due to variations in weather and insect infestations.

Malawi has made a concerted effort to increase cotton production through varietal research, subsidized insect control schemes and credit for inputs. There were 17,000 insect sprayers in use in 1976, 41 percent more than in 1974. Yields of farmers using improved production practices (880 pounds per acre) are twice those of farmers not using improved practices. The Salima and Lower Shire project areas are the most likely sources of any major near term increases in cotton production, but cotton prices must remain competitive with prices of other crops if increased production is to be realized.

Sugar

Malawi has enjoyed a tremendous increase in sugar production and exports over the past few years and both production and exports should continue to grow. In the period 1973-77, Malawi's sugar production increased from 55,000 to 102,000 tons (85 percent) while sugar exports increased from 20,000 to 70,000 tons (250 percent).

Currently, cane sugar in Malawi is commercially produced only by the SUCOMA (Sugar Corporation of Malawi) estate located in the Lower Shire valley. The estate is owned 51 percent by Lonrho Sugar Corporation Limited (LSC),

29 percent by Press (Holdings) Limited and 20 percent by ADMARC.

A new irrigated sugar project is being developed with the aid of foreign donors and loans on the western shore of Lake Malawi by Dwangwa Sugar Corporation Limited, a corporation owned by the same organization which owns the Sugar Corporation of Malawi. Cane for this project will be produced both by small holders and the estate.

Malawi enjoys two important advantages in sugar cane production that make her competitive in world markets--cane yields are relatively high and labor costs are relatively low. A disadvantage is Malawi's distance from a port and transportation problems enroute. Mozambique is having difficulty keeping rail traffic from Malawi and shipping moving smoothly.

Tea

Malawi is a sizable tea producer and production and exports are growing rapidly. In the period 1973-77 tea production in Malawi increased from 52 to 70 million pounds or 35 percent. Nearly all of it is exported with London the principal market. Prices there have been increasing, moving from an average of 55 pence per kilogram in 1974 to 130 pence per kilogram in 1977. Tea is Malawi's second largest foreign exchange earner. Nearly 43,000 acres were in tea production in 1976.

Tea was being grown on estates in the high rainfall areas of Mlanje and Cholo district as early as 1902. Government supported small holder production began in 1967. The Government's Smallholder Tea Authority maintains tea nurseries at Mlanje, Cholo and Nkhata Bay.

Tea is Malawi's second largest foreign exchange earner ($50 million in 1977). Nearly 43,000 acres were in tea production in 1976. Yields are being increased by the use of high yielding varieties and higher fertilizer applications. Malawi tea is generally in the lower grades. The Government is trying to improve its quality by promoting better plucking and growing techniques.

Livestock

Malawi is a relatively small consumer of livestock and livestock products and is largely self-sufficient in their production. In 1977 Malawi's recorded meat trade included only 87,000 pounds of mutton and lamb imports and 138,000 pounds of pork exports. It is estimated that in 1977 there were 735,000 cattle in the national herd of which 70,000 (10 percent, one per 79 persons) were slaughtered (Table 12). About 85 percent of Malawi's cattle are Zebus located in village herds. The rest are exotic breeds and their crosses. Two thousand are dairy cattle, many of which are supplying milk to the Government's three urban milk processing plants (Lilongwe, Blantyre, and Mzuzu). Cattle are kept for many reasons including social status, dowries,

feasts and cash income. The non-financial reasons for keeping cattle in part explain the low herd off-take.

Table 12.--Malawi: Animal population by type, 1977

	Number (000)
Cattle	735
Pigs	200
Sheep and Goats	980

SOURCE: Department of Animal Health and Industry

The Malawi Government has instituted several programs to promote cattle production. They include two slaughter plants operated by Cold Storage Company, a price support scheme, 36 markets, monthly auctions, cattle treks, numerous dip tanks to control east coast fever, fattening schemes, three dairies, oxen training centers, and vaccination programs.

Poultry and pigs are raised in the villages and by large commercial producers. The latter have saturated the urban markets. The Malawi pig population is estimated at 200,000 and is growing rapidly. Malawi goats are extremely hardy and add greatly to the rural meat supply with little management. Sheep do not fare well in Malawi and their numbers are small.

Fish

Malawi has a relatively large fishing industry. Fish landing in 1977 were 66,000 MT of which 844 MT (1.3 percent) were exported (Table 13). Landings are currently three to four times their level before 1968 when trawlers were introduced on Lake Malawi. They were able to land large quantities of previously unexploited fish (chisawasawa).

Table 13.--Malawi: Fish landings, 1970-77

Year	Fish Landings (000 MT)
1970	66
1971	73
1972	84
1973	69
1974	70
1975	71
1976	74
1977	66

SOURCE: Department of Fisheries

Fish is the main source of animal protein in Malawi. Per capita fish consumption is 34 pounds--almost six times that of beef. Fish are consumed fresh, smoked and canned.

Malawi's main fish sources are Lake Malawi, Lake Chilwa and the Shire River. Lake Malawi is most productive

in its southern areas. Much of its northern reaches are too deep to sustain a large fish population. Lake Chilwa has dried up in the past and could again. There is concern that irrigation schemes might affect fishing on Lake Chilwa and the Lower Shire Valley. The Tedzani Falls hydroelectric project is a concern to the latter fishery as well. Overfishing is a problem in some areas and is being regulated to some extent.

The Malawi Government is taking steps to expand fish production. It operates a fish hatchery, provides technical assistance and encourages aquaculture.

APPENDIX D

THE AGRICULTURAL EDUCATION SECTOR IN MALAWI - MANPOWER CONSTRAINTS AND OPPORTUNITIES*

*Prepared by William Levine, Education and Manpower Specialist.

THE AGRICULTURAL EDUCATION SECTOR IN MALAWI
MANPOWER CONSTRAINTS AND OPPORTUNITIES*

I. INTRODUCTION

Malawi, on the eve of independence, appeared to be an improbable nation at best. Like its neighbor Zambia, it had few trained personnel, but unlike copper rich Zambia, Malawi had little apparent need for it. What labor force outside the traditional sector that did exist was largely employed in neighboring Rhodesia or in the mines in South Africa. Hilly and isolated, without visible mineral wealth or modern agriculture, few took Malawi seriously. And yet its steadfast commitment to the development of its agriculture potential has been remarkable. Over the years it has developed a diversified commercial agriculture sector, improved its export performance and has largely met its domestic food requirements. This has been accomplished by a dedicated civil service bolstered by enthusiastic executive support and direction, with a heavy infusion of expatriate expertise, and a narrow focus of operations.

In recent years the Government of Malawi (GOM) has made a commitment to expand its delivery of goods and services within the agricultural sector by seeking to include

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*Prepared by William Levine, Education and Manpower Specialist.

ever greater numbers of smallholders within the commercial agriculture sector. Given the size of the extant agricultural civil service, growth of the commercial agricultural sector and present development projects have resulted in serious manpower strains. The development of the comprehensive National Rural Development Program (NRDP) will place even greater pressures upon the Ministry of Agriculture and Natural Resources (MANR) and its ability to achieve the GOM's eminently laudable goals. This study will locate some of the major constraints facing agricultural manpower development. Specifically, it will concentrate upon services to farmers and formal training. It will then suggest options for overcoming some of these constraints.

Prior to identifying and analyzing some constraints, it is in order to indicate important differences between Malawi and other countries of the region with respect to agricultural manpower and education. First and foremost, the MANR is a ministry of high prestige whose staff is dedicated and enthusiastic about its role. Competition for entry into the service remains keen and is a first choice rather than a last alternative. Opportunities for upward mobility within the service are great (e.g., the principal of Colby College began his career as a commodity demonstrator) and the MANR is attempting to maximize such mobility in order to retain talented personnel. There is strong political support for agriculture as seen in its being second only to transportation in terms of government funding over the years

and the Life President's holding the MANR ministerial portfolio. Such support extends downward and outward. Parents don't view a career in agriculture as a dead end or an admission of failure. At the field level there appears to be genuine cooperation between ministries with respect to maximizing utilization of personnel, facilities, and working toward a common goal. Finally, the MANR's plans are well thought out and carefully prepared in terms of scope and phasing. This process is culminating in the present NRDP which is integrating Malawi's agricultural development projects within a single comprehensive plan to take Malawi to 1990, and its manpower needs are being keyed to this end.

II. CONSTRAINTS

A. Services to Farmers

This section will, from the perspective of manpower, concentrate upon present constraints and likely future obstacles in the way of the GOM's desire to broaden its delivery of goods and services to the smallholders of rural Malawi. After examining the scope of overall personnel shortfalls, it will locate constraints of special significance to present and future agricultural development.

Goods and Services and the Scope of Delivery

The GOM has, since independence, overcome a number of obstacles in developing a dedicated, hardworking agricultural civil service. Extension services, veterinary services, irrigation services, research and marketing services are the major ways that the MANR interacts with the farmers of Malawi. The delivery of these services is not uniform throughout Malawi, however. The greatest impact of such services is experienced in one of the four major project areas. Overall, probably about 25% of Malawi's smallholders are affected by present MANR programs. And yet even at this level of performance the MANR is experiencing significant personnel shortfalls. As Table 14 shows, the MANR has been unable to achieve its 1977 personnel objectives. This is especially significant in field service positions such as

the technical officer posts where fully 1/3 of the positions are vacant. At the technical assistant level, shortfalls have resulted in an overall extension worker to farm family ratio of 1:868. The actual degree of variation is between 1:400 in the major project areas to more than 1:1100 outside.[1] As will be seen shortly, the sizable number of vacancies at the professional end of the scale would be even greater, save for the large number of expatriates.

GOM projections regarding the alleviation of these shortages indicate that considerable strains will continue to exist well into the 1980's. Indeed at the technical officer levels shortfalls in excess of 33% are anticipated until after 1982[2] and the Field Assistant officers' positions will experience increasing shortfalls in posting until after that date as well (see Table 15). The MANR is attempting to compensate for these shortfalls through in-service training and upgrading courses and while these are necessary and desirable steps, they will not significantly alleviate the manpower situation. Thus, given the scope of the NRDP, it is reasonable to question the confidence of the GOM that these shortfalls will not markedly interfere with its ability

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[1]National Rural Development Program 1979/80- 1983/84. Agricultural Research Proposals (Submitted to AID) (Lilongwe: Malawi Government, 1977), pp. 102-103.

[2]Ibid, p. 101.

TABLE 14

MANR STAFF ESTABLISHMENT AND ACTUAL POSTS FILLED - 1977

Category	Establish-ment	Posts Filled	Vacant Posts	% of Vacancies
Tech. Assts. (TA & STA)	1569	1388	181	11.5
Tech. Officers (TO,STO,CTO)	360	244	116	32.2
Prof. Officers	111	92	19	17.1
Super Scale Officers	57	42	15	26.3
Total	2097	1766	331	

Source: NRDP p. 100.

to attain its agricultural goals. The NRDP manpower projections in Table 15 recognize, but make little allowance for, trained personnel being drawn off into the private sector although there is awareness that 20 or more diplomates are being so drawn each year and that additional staff are leaving the service after short terms.[3] And although the program states it will carefully monitor these shortfalls at various levels in order to insure its integrity, it is hard to agree with its contention that such a lack of manpower will have no serious impact upon development, especially around 1982 when the cumulative shortfalls will be highest.

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[3]Ibid., p. 107.

TABLE 15

DEMAND & SUPPLY OF AGRICULTURAL CADRES 1978-1987

Field Assistants (TA,STA) Colby, Thushila/NRC	1978	1982	1987
Project Requirements	1,425	1,937	2,324
Expected Availability	1,263	1,636	2,253
Deficit	162	301	71
Percent	11.4	15.5	3.1
Technical Officers (TO,STO,CTO) Bunda College Diplomates			
Project Requirements	396	482	613
Expected Availability	260	313	491
Deficit	136	169	122
Percent	34.3	35.1	19.9
Professional Officers (PO) Bunda College Graduates			
Project Requirements	118	144	184
Expected Availability	130	204	307
Surplus	12	60	123
Percent	9.2	29.4	40.1

Source NRDP p. 107.

B. The Delivery of Goods and Services - Related Constraints

Despite the dedication of the extension and other field service personnel, constraints concerning the quality and nature of the staffs are not dissimilar to those in surrounding countries. Salary differentials between the government and private sectors have decreased, but the availability of greater perquisites and opportunities continues to drain some of the most effective personnel away from public service.

Interviewees claimed that at the field level the quality of performance was suspect and that improvement was made difficult by the absence of supervisory personnel. The MANR is well aware of these problems and is trying to rectify them through crash courses and periodic exams of field staff, but the day-to-day performance levels are still problematic. At the Lilongwe Land Development Program (LLDP) for example, where the impact of goods and services upon smallholders is probably as great as anywhere in Malawi, one finds that maize yields actually decreased on plots with greater numbers of extension visits.[4] Further, despite extension advice to the contrary, a full 30% of the LLDP farmers planted their crops late, resulting in a decrease in yields.[5] The impression that one is left with in light of these and other examples, is that even under the best conditions the extension service is experiencing difficulty in getting its message across and consequently is not making the optimum use of its existing manpower.

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[4]Survey of Smallholder Agriculture (Lilongwe: LLDP, 1978), p. 15.

[5]Ibid., p. 24.

The infrastructure for a first-rate agricultural research capability exists. The Department of Agricultural Research and the National Agricultural Research Programmes regularly tackle significant problems in attempting to improve the productivity of Malawi's farmers. Beyond the costs of research, which have vastly increased, and the quality of the research plant, which badly needs updating, the present and future research capability remains constrained by the absence of trained Malawian manpower. In some instances, for example, one researcher may have responsibility for as many as three or four projects or will have to shelve projects for lack of researchers. In others, the manpower to conduct essential trials is lacking, adversely impacting upon the applicability of findings.[6] In interviews, researchers claim they were overwhelmed by the collection and organization of data and had little if any time to analyze it. Specific research skills are unobtainable in Malawi and thus the bulk of research is and will continue to be conducted by expatriate personnel until localization can occur, and this will happen only when adequate numbers of Malawians receive foreign training at the graduate level. The intention of the GOM to embark upon its NRDP will ipso facto demand a marked increase in research capacity beyond its present 48 projects, making this a critical area of concern.

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[6]NRDP, pp. 6-9.

The dedication and commitment evident in the research units is every bit as evident in the planning sector of the MANR. Like the agricultural research sector, the planning unit relies upon expatriates and requires rapid training of Malawians as agricultural economists, computer programmers, and staff economists to supplant its expatriate staff. In their absence, foreign assistance for planning will continue to be a major occupation of the MANR.

An area of immediate concern is the lack of women serving in field positions. As elsewhere, food production in Malawi is often women's work. And while there exists an important training facility for Farm Home Instructresses (FHI) at Thuchila, this installation concentrates more on home economics than improved agricultural practices. A mere handful of women (in 1975-76 only 2 of 50 diplomates and 4 of 161 certificate recipients) receive actual agricultural training, and yet the cultural proscription limiting male agricultural field agents' effectiveness in communicating with this important group of Malawi's farmers calls out for large scale recruitment of women to meet these needs.[7] At present, however obvious this fact appears, there is little activity being undertaken by the MANR to alleviate this situation. The civil service interviewed, when queried on this, agreed that it was a problem and promptly pointed to

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[7]World Bank: Malawi: Education Sector Survey 1978, Appendix II, pp. 14-15.

the small numbers of women finishing secondary school and possessing the requisites for entry into training programs.

The provision of veterinary services is a growing need in Malawi. At present there are no domestic facilities for providing veterinarians and the service relies heavily upon expatriates. The obtaining of such foreign experts, however, is becoming increasingly difficult. Great Britain, for example, is the main supplier of veterinarians to Malawi. Although it agreed to recruit 16 veterinarians for the 76/77 period, it was only able to provide five. After scaling down its commitment by half, British efforts for 77/78 could still only locate 6 officers. Malawian supporting staff proved equally elusive. Eleven of the twenty Professional Officer posts in veterinary service remained vacant as of 1977.[8] At the technical level Malawi is beginning to meet its personnel needs. Ironically, one effect of increasing enrollment at Mikolongwe Veterinary Training School has been that while the number of veterinary assistants is increasing, it is doing so at the cost of eliminating short courses for farmers and/or veterinary assistants. Improvement of Malawi's veterinary-related services and its livestock, poultry, and small ruminants industries will likely remain limited for the foreseeable future.

Forest products are essential to the lives of Malawi's farmers both in construction and in fuel. Equally important

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[8]Great Britain: Malawi: Draft 1977 Manpower (1978?) p. 13.

are conservation efforts aimed at preserving Malawi's soil cover on its hilly terrain. While excellent training at the technical level exists, the GOM has no facilities for professional training which must be taken abroad, and in any case, has been largely unsuccessful in recruiting local staffs for such training and obtaining foreign scholarships.[9] As a result, most of the mid-level and senior staff are expatriates. Despite the development of pole and pulp estates, it would appear that professional manpower constraints in this sector will remain considerable and impact Malawi's future development plans.

Note: Two areas where interviewees expressed the need for improvement in number and quality of personnel are those of the Agricultural Development Marketing Corporation (ADMARC) and rural credit facilities. It was stated that ADMARC's organization needed greater rationalizing and its personnel improved training. Timely delivery of outputs such as seeds and fertilizers were singled out for special emphasis as problem areas.

Related to ADMARC is the availability of credit to smallholders insofar as ADMARC administers credit in the major project areas. Manpower and funding amounts were stressed as areas for improvement. Credit, while available in the major project areas, has not been made widely avail-

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[9]World Bank: Malawi: Education, p. 25.

able due to the lack of trained personnel, government policy, and fiscal constraints. Patently, the ability of ADMARC to energetically and effectively supply critical inputs in the new NRDP project areas will prove a major determinant of the overall success of the development of Malawi's rural areas.

III. FORMAL AGRICULTURAL EDUCATION

The availability of agricultural education in Malawi can be characterized in terms of its age and scope. The lack of colonial government expenditure for education as a whole, prior to WW II, dictated that agricultural training, if it occurred at all, would do so at the mission schools scattered throughout the country. The outbreak of WW II witnessed the first government sponsored agricultural center at Makwapala in 1941. It remained the sole source of agricultural manpower training until the 1950's when a forestry training school, a veterinary training school, and Colby College of Agriculture were founded. Special training for women, fisheries personnel, diplomates, and university level degree holders occurred only after independence. The resultant system, then, is one that concentrates heavily upon technical training at the certificate level with considerably less capacity at the diploma and, to a lesser extent, degree levels whence supervisory and professional personnel would likely emerge.[10]

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[10]Colby College of Agriculture Prospectus 1977, Bunda College of Agriculture Prospectus 1978 World Bank, pp. 3-29.

The first and likely sole exposure to formal agricultural education that most Malawian youth experience will possibly be at the upper primary level, where the government has recently (as of 1970) introduced it. At present, however, far fewer than 50% of the primary schools offer agricultural related courses. Agricultural courses are also being introduced into the secondary schools, although here most of the schools presently have such courses.[11] At both levels, the curriculum is in the process of revision--a unified approach to the subject remains undefined.

Access to formal agricultural training occurs at one or more higher educational centers. (see Table 16) In addition, the extension service operates 54 Farmer Training

TABLE 16

HIGHER EDUCATION IN AGRICULTURE

Institution	Length of course*	Emphasis	Present Enrollment
Mikolongwe VTS	2 years	vet.	98
The College of Forestry	2-3½ years	general forestry	79
FHI School at Thushila	1 year	FHI's	27
Fishery TC	1-3 years	fisheries, boat building	c.45
Colby College	2 years	general agriculture	312
Bunda Ag. College	3 yrs/ 5 years	general agriculture	237

*Centers other than Bunda College also operate a number of short courses for lower grade personnel, farmers, fishermen, and senior personnel.

[11] World Bank, p. 30.

Centers (FTC) throughout the country where day courses or residential sessions are provided for farmers and staff. Residential courses may last from a week to a month and cover subjects such as nutrition, pesticides, and horticulture. Additional FTC's are administered by each of the four major project areas. This infrastructure is impressive in the potential it provides for agricultural personnel training, but important constraints exist that impair its fullest use. Most such constraints can be identified as falling into one of three categories: first, the lack of manpower; second, the quality of that manpower; and third, the cost of expansion and/or improvement.

At the primary and secondary levels, the lack of trained manpower is a serious problem and one that prevates the entire education system in Malawi.[12] However, the overall quality of the extant agricultural education staff at this level is probably superior to other disciplines in light of its specialized training. The problem is that there just aren't enough of them participating at the primary level which is the only formal educational experience most Malawian youth will receive. Given the GOM commitment to relevant education experiences, the output of agricultural education instructors must be stepped up markedly. The GOM is aware of this problem, and agricultural education is now being

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[12]See World Bank Report, pp. 15-19.

taught at the Teacher Training Centers (TTC). At issue will be the ability to attract quality candidates into agricultural education positions as well as in all phases of education.

The output of technical assistants at the various certificate granting institutions is proceeding pretty much in accordance with the GOM's projections (although the overall shortfall at this level hovers around 15%).[13] This has been achieved by filling these various institutions to overflowing. The difficulty this creates is that to the extent that the GOM succeeds in achieving its goal, short courses, most auxilliary uses, and upgrading opportunities normally offered at the same institution are being sacrificed. The GOM anticipates that a partial solution to this problem will be achieved with the creation of a Natural Resources College (NRC to be located near Colby College and funded by CIDA) which will provide common first year training facilities for certificate candidates (save forestry students). This will free up space at the other institutions for alternative uses. This is a realistic assumption but will not be actualized until completion of the NRC. At present no working completion date exists.

As stated earlier, one of the critical personnel shortfalls is at the technical officer or diplomate level. Yet, Bunda College, in expanding its degree (BSc) program, is

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[13] See NRDP, pp. 6-22.

similarly crowding out its diplomate efforts. It is anticipated that the USAID-sponsored expansion of Bunda's facilities will squarely meet this problem, but such a solution is going to depend heavily upon the availability of staffing--a problem in its own right that will be treated shortly.

The absence of significant numbers of trained women in the agricultural sector is due, among other things, to their poor performance in primary and secondary schools prior to qualifying for entry into higher education. Intensive efforts must be undertaken to improve their performance and thereby eliminate this serious wastage problem. The situation is acknowledged but it is not a priority, it being felt that overall improvement of the primary and secondary education systems will necessarily solve this problem as well.

The problem of post graduate training is one that will continue to be nettlesome. Manpower needs for specialized training in fields such as agricutural economics, agronomy, horticulture, veterinary medicine, parasitology and the like are gorwing.[14] And yet, the development of graduate facilities at Bunda for such needs, given Malawi's size and economic state, are largely out of the question. This situation has given rise to a heavy and continued reliance upon foreign expertise. The recruitment of such expertise, political considerations aside, is and will continue to be problematic.

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[14]Great Britain: 1977 Draft Manpower Review, p. 13.

Britain, for example, the single largest provider of expatriate personnel for Malawi, was asked to fill 64 positions within the MANR in 77/78 period but could provide only 40.[15] At Bunda College, 14 of 18 staff are expatriates and while 15 local staff are currently in training to replace them, NRDP plans indicate a long term continued reliance upon expatriate staff (USAID plans to provide up to 27 manyears of expertise at Bunda and given the experience of other donors this plan will have to be carefully watched). The projected surplus of degree holders[16] will provide some personnel freed up to pursue foreign postgraduate training, but the GOM has experienced difficulties in having many such individuals accepted for additional education.[17]

A. Related Constraints

A number of related constraints affect the quality of agricultural educated-trained personnel. The quality and quantity of materials available in the sector are very uneven and this impacts negatively upon training. From primary school onward very few texts are written by, for, or published in Malawi and thus the relevance of materials to the agricultural situation in the country is not always apparent.[18]

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[15] NRDP, p. 107.

[16] See World Bank Report, p. 16.

[17] Ibid.

[18] World Bank; personal observation.

At the higher education levels this problem is compounded by a sheer lack of texts to supplement those required, leaving students with little or no opportunity to develop research skills which would better prepare them for problem solving later in their careers. Library needs at Colby (and by extension the future NRC) and Bunda are especially great, a point made by virtually all staff interviewed. In addition to texts and library needs, effective training is being adversely affected by shortages of laborator equipment, classroom space, and shortages of capital.

Staffing requirements at the university level have proved to be a problem insofar as vacancies are often met with short term contracts. (e.g., the University College of Wales at Aberstywth seconds staff for periods as short as one semester). While more attractive for expatriate staff, this adversely affects the continuity of a unified education process. Several staff members interviewed also stated that the politics of recruitment often result in lengthy delays in filling positions which lead to critical subjects not being taught at all, or superficially by staff members. The political and philosophical conservativism of President Banda extends to his personally reviewing personnel decisions at Bunda for signs of radical or moral questionability on the part of the staff. Shortly before the site visit, one professor was dismissed because he marred a woman from Yugoslavia, bring into question his political loyalties. Another was terminated because he allegedly subscribed to

pornographic literature. This situation adds to the already considerable teaching load of individual faculty members (18-20 hours a week) and precludes the ability of the staff to engage students in research.

MANR officials in both planning and extension stated that the present extension curriculum provided at Colby and Bunda did not provide sufficient communications and education skills for extension officers and that this was a primary drawback in effectuating greater acceptance by Malawi's farmers of extension advice. Field staff at the LLDP reiterated this point, suggesting that it lay at the root of disappointing results with respect to the adoption of better farming and more modern farming techniques and technologies.

At the degree level, it was averred by several interviewees that the course of instruction at Bunda is too general and not well-suited to Malawi's special needs. While the need for specialists is undeniable, examination of the curriculum, revised in 1975, with 3/4 of classroom time devoted to technical subjects and more than ½ of the total time enrolled spent on practical work,[19] it is difficulty to sustain this view.

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[19]Bunda College of Agriculture Syllabus.

IV. SOLUTIONS TO MALAWI'S AGRICULTURAL MANPOWER EDUCATION PROBLEMS

The manpower constraints enumerated above are largely known to the GOM and its present and future development plans in the agricultural sector do attempt to take them into account. The major thrust of agricultural development in Malawi for the next fifteen years has been put forward in the form of the NRDP. From the manpower perspective, the GOM is in the process of reorganizing its various MANR service departments to execute the NRDP. This reorganization aims to simultaneously develop infrastructural (social overhead capital) capabilities and launch specific RDP's throughout the country. Staffing requirements for this process were enumerated in Table 15. The GOM is attempting to finance this process on three levels, each of which will necessitate almost total reliance upon foreign donors. First, the GOM has sought financial backing for each of the eight management units (Agricultural Development Divisions (ADD) in the language of the NRDP) - the largest functioning administrative units, modeled after the present major project areas such as LLDP. Secondly, the MANR is developing a central services capability to provide expertise for the development of each of the ADD's. Third, the GOM will continue to seek funding for more conventional RDP's which it will try to key into the development areas (DA's - 5 to each ADD and the level at which specific projects will be introduced) at the rate of three per year throughout the life of the NRDP. In addition,

there will almost certainly be other solicitations for support for projects, which, while relevant to the NRDP, don't conveniently "fit" into the above categories (e.g., USAID's Bunda College Development Project).

The GOM has indicated that it desires US assistance for the NRDP in the form of helping the MANR to establish a first rate research capability within its central services. Such a project, five years in duration including an infrastructural and recurrent budget support aspect, will concentrate heavily upon training badly needed research personnel and, as such, is central to the success of the NRDP. The program (i.e. Agricultural Research) with two important exceptions is well planned and this potential US role is carefully dove-tailed into the efforts of other major donors. One problem is that the GOM estimates for the various parts of this research effort as seen in Table 17 are probably conservative. Given the costs of foreign education and the general rate of inflation, these figures are probably conservative by as much as 20%. A second exception has to do with the extent to which the Research proposal concentrates overwhelmingly upon commodities. There is little interest expressed in research of a social science nature and yet farmer response to extant MANR programs has been a source of concern to officials. When appraised of this absence in their proposal, however, officials interviewed indicated that social

TABLE 17

BREAKDOWN OF COSTS FOR GOM AGRICULTURAL RESEARCH REQUEST TO USAID

Program	Total Costs (US,000)	Salary Component for add'l staff (000 US)	Type of Staff supported	Training	Training
Seed Production	238	-	-		
Maize Research	277	35.6	2 PO 2 TO		
Groundnut Research	123	14.8	2TO		
Tobacco Research	196	43.8	1PO 2TO 3TA	12-20 laborers	
Wheat	177	23.2	1PO 2TO 2TA		
Sunflower	180	34.8	1PO 1TO 2TA	10 laborers	
Livestock	627	40.1	1TO 6TA	6CO	
Sugarcane	92	22.8	2TA	4 supporting staff	
Vegetable & Fruit	434	94.1	2PO 4TO 12TA		
Soils	367	60.8	3PO 4TO		
Farm Machinery	174	22.8	3TO		
Research Liaison Officers	418	95.3	4PO		
Research Staff Training	1054				95 MA,PhD
Total Base	4357	477.5	# staff 196	training 95	
Continuing	1739				
Projected Cost	6096				

Source: NRDP Agricultural Research Proposal, pp. 13-24.

science research was seen as a politically sensitive issue, one that they were hesitant to comment upon. This said, on balance US assistance in this critical area is clearly warranted. Our research and manpower training capabilities in these areas are well matched to Malawi's needs.

Other opportunities for assistance will grow out of this program and the devolution of the NRDP. A continuing concern of USAID should be to keep the issue of social science research alive with the GOM. An additional component including social science research could be suggested say, two years into the program. Key issues for study would include cultural constraints to modern agricultural practices, the role of women in food and commercial sectors, studies of rural Malawian youth in farming, and (perhaps most sensitive) population related matters.

Continuing support for Bunda College's expansion will go a long way toward improving Malawi's needs for diplomates in agriculture. Close attention should be paid to the development of the NRC at Colby. US involvement in a collaborative role with CIDA should be explored. USDAID's experience at Bunda would place it in an excellent position to assist Canada in this effort. Having moved to the forefront of the role of women, USAID might have an important role to play with OXFAM and/or CIDA in expanding and upgrading the women's training component at NRC.

In-service training of staff, while an important consideration, should be left to UNDP and Great Britain

whose experience in this area is much greater.

Finally, the impressive record of Malawi in agriculture and USAID's growing role in the NRDP will be such that reliance upon an ad hoc presence is no longer warranted. The mission needs and deserves a full time professional presence.

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APPENDIX E

THE NATIONAL RURAL DEVELOPMENT PROGRAM (NRDP)

National Rural Development Program (NRDP)

The National Rural Development Program is basically a phased expansion of the original intensive area projects on a less intensive scale to cover the country in 17 years.] The strategy stresses minimum capital investment and project elements which have more immediate development impact as shown in the earlier major projects. Emphasis is on providing improved high yielding crop varieties and related cultural practices, inputs and market services, extension education, rural credit and basic rural road network. The cost of the NRDP program is estimated at $13.00 per acre or 26.50 per person over 17 years.

A. Basic Objectives

NRDP has three basic objectives:

1. To increase Malawi small holder production of domestic needs, import substitution and for export.

2. To increase agricultural productivity and thus small holder welfare by assuring access to needed inputs and services.

3. To preserve Malawi's natural resources by encouraging conservation linked crop production, developing multi-use conservation programs, and developing forestry reserves on customary land.

B. Basic Structure

To plan and implement NRDP, the country has been divided geographically into eight agricultural development divisions (ADD), each with approximately 125,000 farm families and each administered by a management unit. Each

]The following description of NRDP is based on Malawi Government, National Rural Development Program, Policies Strategy and General Features, Ministry of Agriculture and Natural Resources, 1977.

ADD is subdivided into five development areas each with approximately 25,000 farm families. Each ADD will constitute a Rural Development Project (RDP). The development areas, and consequently projects, are further subdivided into four to five Extension Planning Areas (EPA) of about 5,000 families each. They will be under the extension management of one technical officer (T.O.) who will supervise 12 technical assistants (T.A.) handling approximately 600 farm families each.

c. Phasing

The Rural Development Project will be developed in four phases:

1. Preparatory Phase--This two to three program will include land resource and agroeconomic surveys and the establishment of agronomy trials where necessary, followed by detailed physical and economic planning.
2. Extensive Phase--This phase is expected to take about five years and will involve investment in production related items such as improved extension and training, marketing, supply of inputs and credit and the construction of essential supporting infrastructure.
3. Intensive Phase--This five year phase will be more or equivalent to the on-going major projects. It will involve more attention to research and the introduction of new crops and processing technologies.

4. Consolidation Phase--This phase will involve a continuation of more intensive development, further improvements to social infrastructure and possibly the development of rural industries.

It is planned to start three Rural Development Projects (RDP) each year, shared evenly among the North, Central, and Southern regions of the country. The specific areas will be selected using the following criteria:

a. Areas with high, but largely underdeveloped potential;

b. Areas where considerable initiative is being shown;

c. Areas of food deficit;

d. Areas of ready accessibility; and

e. The need to maintain an even balance in providing development assistance to all regions.

NRDP is a very ambitious undertaking. It will require considerable international donor support to see it through. Support will be needed both for the expenses involved in preparing and managing the various projects and for the central government agencies that plan the overall projects and supply needed services. NRDP direct project costs are projected over the 17 year life of the program at $90 million, while costs for central services are projected at $50 million, a total of $140 million. These figures are subject to change as donors negotiate changes in the NRDP plan.

D. Donor Support

A large number of major donors have expressed interest in supporting the NRDP. Which donors will support which parts has not been finally determined, but a proposed list of donors matched with projects has been drawn up (Tables 18 and 19). It includes such major donors as the World Bank, United Kingdom, European Development Fund, West Germany, Canada, and United States.

E. Research Component

It has been proposed that USAID support NRDP's research component. This appears to be an ideal development project in that it attacks one of the most critical needs in Malawi's agricultural development, the need for a productive and profitable package of inputs for the extension agents to extend and the farmers to use. The project is also attractive because it is a self contained package that does not directly depend on the contribution of other donors.

Malawi's proposed five-year NRDP research program has several facets. They include research on seed production, corn, peanuts, wheat, sunflower, livestock, fruits and vegetables, soil fertility, and farm machinery. In addition the program includes liaison officers and staff training (Table 20).

Table 18.--Malawi: Development areas to be initiated by 1981 and actual/prospective donor

Development Areas (RDPs)	Actual/Prospective Donor	ADD/Management Unit	Development (to be started)
LLDP Area[a]	World Bank	Lilongwe	1968-69
Thiwi/Lifidzi	World Bank	Lilongwe	1976-77
Ntchew	World Bank	Lilongwe	1978-79
East Lilongwe	United Kingdom	Lilongwe	1980-81
Dedza	United Kingdom	Lilongwe	1980-81
Chikwawa	World Bank	Ngabu	1969-70
Nsanje	World Bank	Ngabu	1969-70
Karonga	World Bank	Karonga	1972-73
Chitipa	World Bank	Karonga (only live-stock in 1972-73)	1976-77
Salima	E.D.F.	Salima	1968-69
Bwanje Valley[b]	E.D.F.	Salima	1977-78
Henga Valley	E.D.F.	Mzuzu	1979-80
Mzimba (Rukuru-Kasitu)	World Bank	Mzuzu	1976-77
S. W. Mzimba	United Kingdom	Mzuzu	1980-81
Ntchisi	E.D.F.	Kasungu	1978-79
Kawinga	West Germany	Zomba	1976-77[c]
Namwera	A.D.F.	Zomba	1977-78
Mwanza	United Kingdom	Blantyre	1979-80
Phalombe	United Kingdom	Blantyre	1978-79

SOURCE: Malawi Government, National Rural Development Programme, Agricultural Research Proposals, MANR, 1977, p. 4.

[a]Lilongwe Land Development Programme--Phase III Area.

[b]This is an extension of the Salima D.A. and expected to become part of a new D.A. under the Zomba A.D.D. in the 1980's.

[c]Pre-investment activities have started in 1976-77 financed by the World Bank.

Table 19.--Malawi: Phasing and actual and prospective donors for agricultural development division management units and for central services

Item	Actual/Prospective Donor	Proposed Year
Mzuzu Management Unit	E.D.F.	1978-79
Kasungu Management Unit	E.D.F.	1979-80
Lilongwe Management Unit	I.D.A.	1978-79
Zomba (Liwonde) Management Unit	West Germany	1978-79
Blantyre Management Unit	U.K.	1978-79
NRDP Central Services		
Planning and Agro-Economic Survey	IDA	1978-79
Land Resources Surveys	IDA	1978-79
National Sample Survey of Agriculture	IDA	1978-79
Research	USAID	1978-79
Research (District Trials)	IDA	1978-79
Meteorological Data Collection	West Germany	1978-79
Training (Staff)	UNDP	1978-79
Accounting and Other Technical Staff	IDA	1978-79
NRDP Construction Unit	EDF	1978-79
Credit	CIDA	1978-79

SOURCE: Malawi Government, National Rural Development Programme, Agricultural Research Proposals, MANR, p. 4.

Table 20.--Malawi: Estimated cost of NRDP Research Component

Cost Component	Amount ($ 000)	Percent of Total Cost
Civil Construction	1,569	36
Vehicles and Equipment	483	11
Salaries and Wages	474	11
Other Operating Costs	776	18
Staff Training Costs	1,054	24
TOTAL	4,356	100

SOURCE: Malawi Government, National Rural Development Programme 1979-80 - 1983-84, Agricultural Research Proposal, December 1977, p. iii.

The total cost of the proposed research program would be $4.4 million (since up 10 percent due to depreciation of the dollar).

APPENDIX F

IMPACT OF FREER TRADE WITH RHODESIA (ZIMBABWE) AND SOUTH AFRICA ON MALAWI AGRICULTURAL DEVELOPMENT

IMPACT OF FREER TRADE WITH RHODESIA (ZIMBABWE) AND SOUTH AFRICA ON MALAWI'S AGRICULTURAL DEVELOPMENT

Malawi has free trade with South Africa through Mozambique. Trade with Rhodesia (Zimbabwe) was almost completely cut off with the closing of the Rhodesian-Mozambique border in 1976. Historically, both South Africa and Rhodesia have been important trading partners with Malawi. Before the closing of the Rhodesian border, Rhodesia supplied 12 percent of Malawi's recorded imports and took 7 percent of Malawi's exports (Table 2). Since the closing of the border recorded trade between the two countries has been almost nil. South Africa seems to have been the main beneficiary of the near complete cut off of trade between Rhodesia and Malawi. Since 1975 South Africa's share of Malawi's imports have increased from 24 to 36 percent (Table 2). South Africa takes about 6 percent of Malawi's exports. Malawi trades very little with other African countries.

Freeing trade with Rhodesia would impact on Malawi in several ways.

1. It would increase the volume of trade between the two countries because their close proximity and complementary products make them natural trading partners.

2. It would reduce Malawi's imports from South Africa.

3. It would reduce the cost and increase the availability of some light industrial goods and agricultural inputs to Malawi.

4. It would increase the competition for Malawi's tobacco exports. Malawi has taken up much of the slack in the international tobacco market caused by the Rhodesian embargo.

5. It would have little or no effect with Malawi's trade with other African countries.

APPENDIX G

MINISTRY OF AGRICULTURE AND NATURAL RESOURCES (MANR)

THE MINISTRY OF AGRICULTURE AND NATURAL RESOURCES (MANR) [1]

The development of the agricultural sector in Malawi is controlled by the Ministry of Agriculture and Natural Resources under the direction of the Minister, His Excellency Kamuzu Banda, The Life President of the Republic of Malawi, and his Permanent Secretary. The Ministry has three major divisions which have been reorganized recently to suit the implementation of the new National Rural Development Program, a program to intensify development efforts across the country over a 20-year period rather than concentrate them in smaller development project areas.

The major divisions of the Ministry of Agriculture and Natural Resources are: Agriculture Division (Agricultural Development, Agricultural Research, Animal Health and Industry), Natural Resources (Fisheries, Hydrology and Water Resources, National Parks and Wildlife, Geological Surveys, Forestry and Planning Division), and the Administration Division. The responsibilities of these divisions particularly as related to the newly established National Rural Development Program are outlined as follows.

I. AGRICULTURAL DIVISION DEPARTMENTS

A. Agricultural Development Department

This newly formed department is responsible for crop development, rural development, extension and training, marketing coordination, and technical services throughout

[1] This portion of this report is based mainly upon Government of Malawi, National Rural Development Programme, Policies, Strategy and General Features. 1977.

the country. It will supervise NRDP activities through the 8-10 development divisions being established throughout the country.

B. Agricultural Training Department

Agricultural training is provided at three levels: degree (5 years), diploma (3 years) and certificate (2 years). The degree and diploma programs are offered at Bunda College of Agriculture (near Lilongwe) a part of the University of Malawi. USAID is currently financing expansion of these facilities and some staff. A certificate program is offered at Colby College (also near Lilongwe) and at other locations. Most of the certificate programs are being consolidated into the new Natural Resources College under construction near Lilongwe.

C. Research Department

Under the reorganization of MANR for NRDP agricultural research activities fall under the Department of Research. These include work at the various agricultural research stations, at Bunda College and by the Tea Research Foundation. With the introduction of NRDP more district experimental sites will be established in addition to intensifying work at the main research stations. USAID is considering financing part of the research component of NRDP.

D. Animal Health and Industry Department

The Department is responsible for disease control,

livestock improvement, dairy and poultry development and veterinary investigations and diagnostic services. Compared to neighboring countries, Malawi is relatively free of major animal diseases though foot and mouth disease, east coast fever, tuberculosis and tryparosomiasis are problems in certain areas. The Department helps to reduce the incidence of animal diseases by immunization, institution of disease-free areas, dipping facilities for east coast fever (316 dip tanks) and vaccination against tuberculosis and New Castle disease.

The Department promotes genetic improvement in several ways including artificial insemination and providing improved Zebu, Friesian, Brahman, and cross-bred bulls and cows. It facilitates animal marketing by operating 36 cattle markets, 8 holding grounds and providing 1,500 animals to individual farmers for stall fattening. The government also trains oxen (2,349 pairs in 1975) and with the help of UNDP and Danish bilateral aid established milk processing plants being supplied by 500 farmers. The country has become self-sufficient in eggs and poultry in part through a government scheme supplying small holders with caged birds.

II. NATURAL RESOURCE DIVISION DEPARTMENTS

A. Fisheries Department

Per capita consumption of fish is estimated at about 18 pounds, 70 percent of total animal protein consumption. The chief fish sources are the lower reaches of Lake Malawi

(most of the lake is too deep for good fishing), Lake Chilewa and the Lower Shire. The government conducts fishery research and provides education and training to fishermen. Assistance has been given in boat building and fish farming. Though the upper reaches of Lake Malawi appear underexploited, some lake areas are overfished and fishing there is being regulated.

B. Forestry Department

The Department manages the country's plantations and forest resources. It helps protect and conserve forests and looks after the production of wood and timber from plantations. It is government policy to provide timber for saw wood and an export oriented pulp industry. Farmers are to grow poles and fuelwoods in NRDP project areas using government supplied seedlings.

C. Geological Surveys Department

The Department provides information on the geology and mineral resources of Malawi and such technical services as identification of minerals, drilling investigations and chemical analysis of rocks, soils and water. The Department is also responsible for the construction and maintenance of boreholes and wells in project areas.

D. Hydrology Department

The Department provides information on the surface water resources of Malawi. Through surveys they collect

data on stream flows, lake water levels and evaporation. They plan studies on water sediment, quality and transportation.

III. AGRICULTURAL PLANNING DIVISION

This division was established to collect and analyze farm and rural socioeconomic baseline data for project planning and future evaluation, collect marketing data and forecast marketing trends, conduct economic evaluation studies and coordinate evaluation programs in project areas, and prepare and develop projects and monitor their execution.

IV. STATUTORY BODIES AND OTHER AGENCIES

There are a number of statutory bodies and other agencies involved in agricultural development in Malawi. They are discussed below. Several were established to assist small holders to produce traditional estate crops.

A. Kasungu Flue-Cured Tobacco Authority

This organization's main function is to promote and foster the development of flue-cured tobacco grown by small holders in Kasungu district.

B. Small Holder Tea Authority

The Authority was established in 1963 to promote tea production by small holders in Mulanje and Thyolo districts. The area under tea cultivation in the Southern region increased from 8 acres in 1964-65 to 3,601 acres in 1975-76.

C. Small Holder Sugar Authority

This authority is being established to provide small holders in the Dwangwa sugar project area with training, inputs (credit and machinery), transport and marketing services for sugar cane.

D. Small Holder Coffee Authority

This agency was dissolved in 1974 but there are plans to revive it to promote the development of the coffee industry along commercial lines for the benefit of small farmers. ADMARC is currently responsible for marketing and processing small holder coffee.

E. The Agricultural Development and Marketing Corporation (ADMARC)

ADMARC, the most important single economic enterprise in Malawi, buys and sells crops (in some cases is a monopoly buyer), establishes markets and warehouses, supports prices, develops agricultural production and processing facilities, supplies agricultural inputs and supports research and some private agro-industries.

ADMARC is administered by its Executive Chairman and from four to eight directors from its headquarters in Limbe and three regional offices. The main crops handled are tobacco, cotton, peanuts, corn, pulses, cassava and paddy rice. Surpluses of commercially grown cash crops are available for export. Secondary crops traded by ADMARC include

sunflower seed, wheat, arabica coffee, oilseeds and miscellaneous cereal and horticultural products.

To facilitate the marketing of agricultural products in Malawi, ADMARC maintains 52 main storage depots/markets and 700 seasonal buying stations. ADMARC has over 250,000 tons of storage capacity placed throughout the country.

Minimum prices are guaranteed to farmers by ADMARC. They are announced at planting time but may be increased at harvest if market conditions allow. In 1976 ADMARC had a $15 million price support reserve and a crop reserve (in storage) of $7 million.

ADMARC's development division operates several estates and agricultural processing facilities. Commodities produced on their estates include tobacco, nuts (cashew, tung and macademia); corn, sorghum, beef, pork, eggs and broilers. Smaller scale projects exist to evaluate the production of citrus and pyrethrum, and for the export of Karaya gum, honey and beeswax.

In addition to the above, ADMARC provides farmers with such agricultural inputs as improved seed (some from their own farms), fertilizers, pesticides, spraying equipment, farm carts, and plows. They also invest in other agro-industrial and financial enterprises.

ADMARC has grown considerably in size and profitability. In 1975-76 its net assets were $63 million and its trading profit was $12 million (19 percent return on equity). In

1975-76 its administrative and selling expenditures were each 4.0 percent of sales.

F. Cold Storage Company (CSC)

Cold Storage Company (CSC) is a wholly owned subsidiary of Malawi Development Corporation and is the official auction cattle buyer handling about 20 percent of cattle slaughterings. The organization is responsible for guaranteed and stabilized prices and for all meat imported for local consumption. It operates abattoirs in Blanttyre and Lilongwe with processing facilities and will slaughter for licensed butchers.

G. National Oil Industries Limited (NOIL)

This company processes cotton seed and paddy rice for ADMARC for a fee. It is jointly owned by ADMARC (50 percent), Malawi Development Corporation (30 percent) and Press (Holdings) Limited (20 percent). NOIL currently operates 6 rice mills with 39,600 tons capacity and two rice parboiling plants, one at Blantyre and one at Chilumba. Its cotton seed oil crushing plant at Blantyre is not operating at capacity for technical reasons and may be replaced.

APPENDIX H

PUBLIC POLICY IN AGRICULTURE

PUBLIC POLICY IN AGRICULTURE[1]

The Malawi government has put great emphasis on agricultural development supporting it with about one-third of the national budget. Increased production in the past has come from expanding the area under cultivation but since only marginal land is left uncultivated, future production increases will have to come from higher yields.

Malawi's agricultural policy has taken four basic approaches: (1) integrated regional development programs implemented by semiautonomous project, (2) a national extension effort, (3) settlement schemes, and (4) producer price programs and market development for agricultural imputs and products. In addition various departments in the Ministry of Agriculture and Natural Resources and other ministries carry out specific activities aimed at furthering food and fiber production.

I. INTEGRATED REGIONAL DEVELOPMENT PROJECTS

Malawi has four comprehensive integrated regional development projects designed to increase small holder productivity. They cover 9,200 square miles and contain about 280,000 families (1,213,000 people). The cost per adopting farmer in the four prcjects ranges from $600 to $1,300.

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[1]This portion of this report is based mainly upon Government of Malawi, National Rural Development Programme, Policies, Strategy and General Feature., 1977.

A. Lilongwe Land Development Program (LLDP)

This integrated small holder project, financed by the International Development Association, provides for a road network, a soil conservation system, marketing centers, credit, land registration and extension education. It has been successful in reaching a large proportion of farmers, increasing yields for corn and groundnuts and in obtaining excellent repayment records on its credit.

B. Shire Valley Agricultural Development Project

This project, also supported by IDA, in its first phase supplied credit to cotton farmers for back-pack sprayers and insecticides. Yields of participating farmers tripled over non-spraying farmers. Loan repayments averaged 97 percent. Phase II of the project continued cotton spraying but also provided credit and extension for several other crops, inputs for a district grazing scheme, some land reorganization and improved social facilities.

C. Salina Lake Shore Development Project

This project, originally funded by the West German Government, is similar to the Lilongwe integrated project but with less emphasis on road construction and soil conservation. Major project crops are cotton, corn and peanuts. Yield targets have been achieved.

D. Karonga Rural Development Project

This project, located in the remote north, is financed in part by IDA. It provides extension and credit for cotton, corn, peanuts and rice and some irrigation facilities. A livestock component provides improved disease control and stock watering.

II. GENERAL EXTENSION

The Extension and Training Department promotes improved farming techniques throughout the country but focuses mainly on progressive farmers (Achikumbi). Areas of progressive farmers have been offered additional credit and some infrastructure.

III. SETTLEMENT SCHEMES

These provide underutilized land and water resources for use by Malawi young pioneers, especially selected and trained young persons with limited employment alternatives.

IV. AGRICULTURE PRICE AND MARKETING PROGRAMS

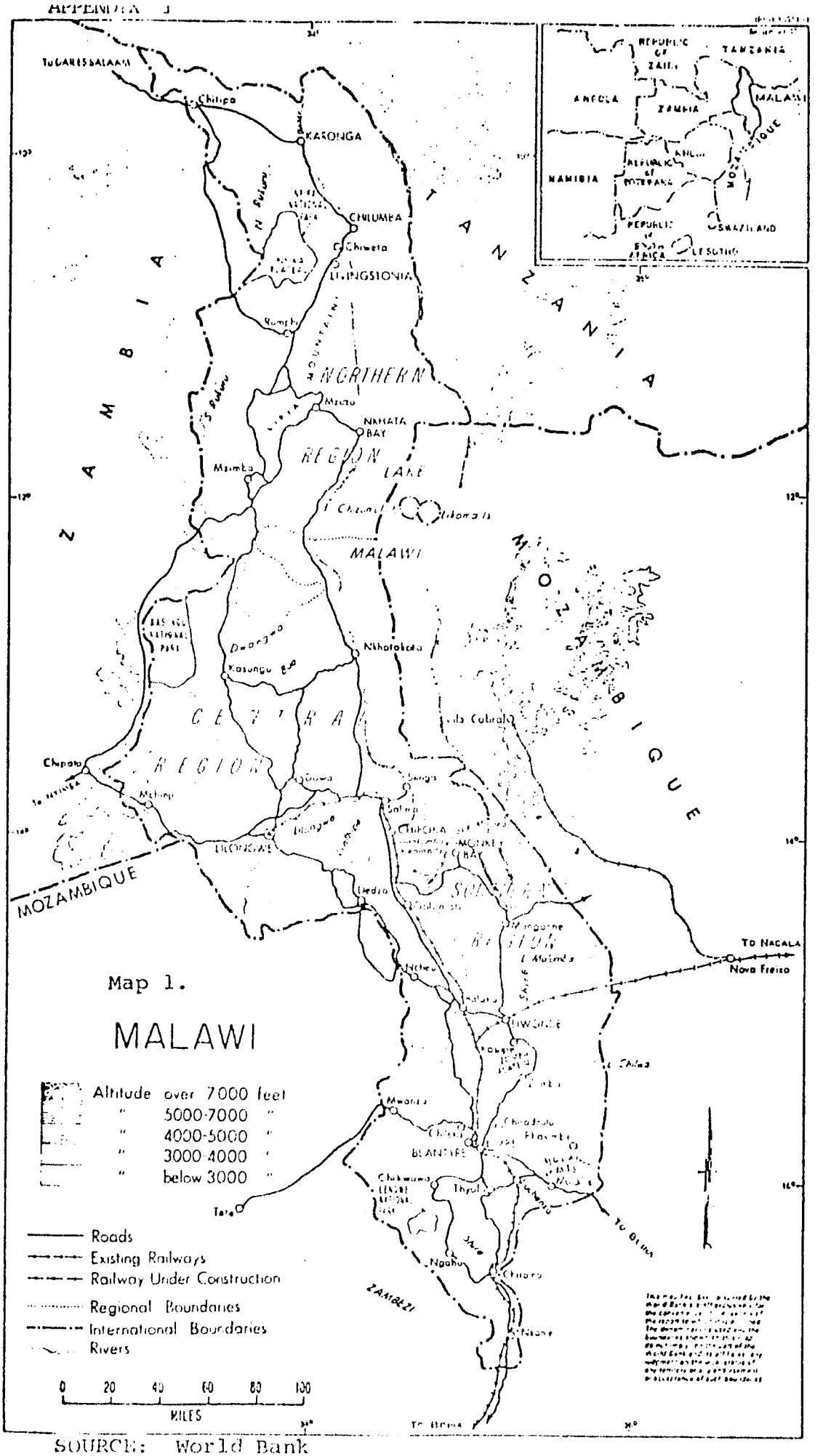
The Agricultural Development and Marketing Corporation (ADMARC) is purchaser of last resort at set prices for most Malawi crops and supplies many agricultural inputs such as fertilizer, insecticides, seeds and equipment at cost or near to cost. ADMARC is the sole exporter of corn and coffee. In addition, ADMARC has established market places throughout the country and provides short and long-term warehousing.

Prices paid by ADMARC are set at planting time and are designed to reflect import or export parity. Profits made on trading and exports are used for development projects.

ADMARC has an important development function. Its estates produce tobacco, tung nuts cashew nuts, macademia nuts, seed corn, livestock and poultry. In addition, it operates plants for processing fruits and vegetables and tung nuts.

APPENDIX I

MAP OF MALAWI



SOURCE: World Bank

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