Agricultural Sector Assessment

Z A M B I A

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

Prepared for
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August, 1978

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APPENDICES:

GLOSSARY OF TERMS AND ACRONYMS

AFC	Agricultural Finance Corporation
CDP	Cattle Development Project
CIDA	Canadian International Development Agency
COZ	Credit Organization of Zambia
CSB	Cold Storage Board
DRC	Domestic Resource Cost
EEC	European Economic Community
FI	Farm Institutes
FOB	Free on Board
FRG	Federal Republic of Germany
FTC	Farm Training Center
GOZ	Government of Zambia
IDZ	Intensive Development Zones
ILO/UNDP	International Labor Organization
MLA	Ministry of Lands and Agriculture
NAMBoard	National Marketing Board
NRDC	Natural Resource Development College
PAO	Provincial Agricultural Officers
PETO	Provincial Extension Training Officers
RC	Rural Councils
RGA	Rural Growth Areas
RGC	Rural Growth Center
RSA	Republic of South Africa
SADAP	Southern African Development Assistance Project
SCS	Soil Conservation Scientist
SECID	South East Consortium for International Development

SIDA	Swedish International Development Agency
SNDP	Second National Development Plan
TBZ	Tobacco Board of Zambia
TNDP	Third National Development Plan
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
UNDP/FAO	United Nations Development Program/Food & Agricultural Organization
UNIP	United National Independence Party
UNZA	University of Zambia
US	United States
USAID	United States Aid for International Development
USDA	United States Department of Agriculture
WHO	World Health Organization
ZAM	Zambia
ZCA	Zambia College of Agriculture

Currency Equivalents

U.S. $1.00	=	Kwacha
Kwacha kl	=	U.S.
Ngwee (N) 100	=	Kwacha 1

Weights and Measures

1 Hectare (Ha)	=	2.471 acres
1 Square kilometer (Km^2)	=	100 ha = 247 acres
1 Kilometer (Km)	=	0.621 miles
1 Kilogram (Kg)	=	2.2 pounds
1 Metric ton (Ton)	=	2,204.6 pounds
1 Liter (L)	=	2.116 U.S. pints
1 Bag Maize	=	90 Kg
1 Bag Groundnuts	=	80 Kg
1 Bag Sunflower	=	50 Kg
1 Bag Soya Bean	=	90 Kg
1 Bag Wheat	=	90 Kg
1 Bag Paddy Rice	=	80 Kg

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S A D A P

Agricultural Sector Assessment for Zambia

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July, 1978

APPRAISAL OF EXISTING POLITICAL, CULTURAL AND ENVIRONMENTAL CONSTRAINTS

A. POLITICAL SITUATION IN ZAMBIA

1. Internal Situation and Relationship to Other Countries

Zambia gained its independence in October, 1964 under the leadership of Dr. Kenneth Kaunda. A one-party state under Dr. Kaunda's United National Independence Party (UNIP) was decreed by law in December, 1972. Elections will be held for President and parliament in November, 1978.

The political philosophy of the President and party is humanism which is basically hostile toward private enterprise, capitalism and foreign ownership. The government thus took over controlling interest in the copper mining companies and most of the larger business firms.

The philosophy of humanism creates some ambivalence in policy formulation for agriculture, especially in the holding of land. "The obvious alternatives -- state farms or private individual farms -- are both viewed as being in conflict with humanism. The centrality of man and the rediscovery of traditional values do not easily co-exist with massive state farms."[2] Encouragement of individual farming could also lead to the growth of capitalism and an elitist class. The most recent Land (Conversion of Titles) Act of 1975 affecting land ownership will be covered under land tenure.

The political philosophy of humanism mixed with the often pragmatic practice of capitalism has created policy conflicts and uncertainties and disincentives for investment and individual enterprise in agriculture, but it probably is the climate in which development will have to take place.

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[2]USAID, Transition in Southern Africa -- Zambia, Southern Africa Task Force. February, 1977.

Zambia's foreign policy has been shaped by its location, its political philosophy and its perception of the realities of Southern Africa. Geographically contignous with seven of the ten (including RSA) states of the region, Zambia's location would have made it hard in any case for it to avoid becoming involved in the political interactions of its neighbors. This likelihood has been made a certainty, given the political philosophy of Zambia's leader and president, Kenneth Kaunda and its single party UNIP. The GOZ's commitment to its variant of African socialism includes special emphasis upon the importance of the principle of majority rule. Accordingly it has at one time or another offered support and sanctuary to independence movements in Angola, Mozambique, Zimbabwe, Namibia and South Africa. Its denunciations of Portugal, Rhodesia, and South Africa have been major themes in Zambia's foreign policy for more than a decade.

This active role as a frontline state has, however, been tempered by the government's realization that political and economic realities dictate a flexible posture. Thus, while nationalizing Zambia's copper mines, Zambia still accommodates Anglo-American and Roan Selection Trust managerial personnel from South Africa to continue operation of its mines. Similarly, its hostile position toward privately owned estate agriculture has witnessed a decline in the number of foreign held farms and yet a substantial number of those farmers remaining are from South Africa. Until Rhodesia's decision to close the border with Zambia in 1973, Zambia did not let its support of Zimbabwe liberation organizations disrupt its flow of trade with its southern neighbor.

Present relations between Zambia and Malawi are strained because of Malawi's decision to maintain links with the minority ruled states to the south, but trade and interactions between the two states continue at a fairly constant pace. Relations between the GOZ and its Portuguese-speaking neighbors Angola and Mozambique are fraternal but little more. Restoration of the Lobita rail link to the Atlantic and future reopening of the link through Zimbabwe to Beira in Mozambique should have the effect of improving Zambia's options for movement of its copper ore and agricultural goods.

In foreign trade, Zambia has been fortunate to have a major natural resource for export -- copper. But copper as a primary product suffers price instability related to worldwide supply and demand. Since 1975, copper prices have been depressed with a slight recovery in 1976 and another slump

in 1977. The volume of export has also been affected by the closing of the Rhodesian border, the disruption of the railroad through Angola and congestion in the port of Dar es Salaam.

The balance of payments since 1974 have been as follows:

Current Account Balance, 1974-77[3]

(Millions of Kwacha)

	1974	1975	1976	1977
Exports FOB	898.2	523.1	751.9	704.3
Imports FOB	508.6	599.6	468.6	592.8
Trade balance	389.6	-76.5	283.3	111.8
Invisibles (net)	-341.1	-316.0	-324.0	-330.3
Current account balance	48.5	-392.5	-40.7	-218.5

Copper has provided about 90 percent of the foreign exchange earnings, and the drop in prices shows up in lowered export value in 1975 and 1977.

The drop in copper prices is not so much a constraint to agriculture as a challenge; a challenge to diversify exports mainly by increasing production of appropriate agricultural products and to use fortuitous future copper earnings as an impetus for this investment in diversification. Long-run planning should not count on copper to come back as a major export item; production costs are increasing both because of inflation and less accessible deposits. The world demand and supply are uncertain, and eventual mining of ocean nodules could profoundly affect supply and price.

2. Domestic Policies of Importance to Agriculture

a. Foreign Exchange and the Domestic Budget - In 1965, Zambia joined the International Monetary Fund and set its kwacha value at U.S. $1.40. When SDR's were created, the kwacha remained constant in SDR's as the dollar was devalued, and eventually rose to an effective rate of U.S. $1.56. The balance of payments crisis caused by the copper price decline brought about devaluation in 1976 of 20 percent to U.S. $1.25, and in March, 1978, a further

[3]Government of Republic of Zambia, The Current Economic Crisis, Government Response and Approach to the Third World Plan, May, 1978, p.3.

devaluation of 10 percent.[4]

The domestic budget has also suffered from the decline in copper prices since the tax on copper companies has supplied a substantial part of domestic revenue. The figures below show this.

Zambia Government Finance, 1974-78[5]

(Million Kwacha)

	1974	1975	1976	1977	1978 Budget
Revenue	651.0	462.3	462.0	510.7	550.7
Taxes on mining	339.3	59.3	11.6	0.1	0.0
Other	311.8	403.0	449.2	510.6	(550.7)
Total expenditures and net lending	566.6	776.2	731.9	770.1	710.9
Current surplus (+) or deficit (-)	246.7	-69.5	-100.4	-82.9	-30.1
Overall surplus (+) or deficit (-)	84.4	-313.9	-269.9	-259.4	-160.2

The table shows clearly the decrease in revenue from copper (mining) from 1975 on, and the increase from other sources. This increase was accomplished by increased sales tax on certain items, an increase in corporate profits tax and an increased tax rate in middle range income brackets. Revenue has not yet recovered to that of 1974, but deficits, current and overall have been reduced since 1976. The deficits are made up of foreign borrowing and mostly by domestic borrowing from the banking system.

Expenditures declined after 1975 (except 1977) but would have increased considerably without stringent government actions which reduced the level of subsidies, froze government hiring except where vital, undertook no new projects -- giving preference to agriculture.

The share of investment in agriculture in the 1978 budget is proposed to be 17.9 percent compared to 12.8 percent in 1977; an increase of over 40 percent. Even though the total budget is less than in previous years, an increased amount of kwacha will go into the agricultural sector -- to be

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[4]Ibid, p.8.

[5]Document of International Monetary Fund, Zambia - Recent Economics Developments, April, 1978, p. 23.

spread among several activities including the extension service, research, training, land use, cooperative and crop and livestock projects. The sizeable subsidies to consumers and producers requiring 82.8 million kwacha in 1975 are reduced to 44.2 million in the 1978 budget. From 1977 to 1978, subsidies are decreased by 33 percent by increasing the maize meal price by 22 percent and the fertilizer price by 18 percent.[6]

i. Constraints

The budget situation places a major contraint on agricultural development, but the government is relieving this by increasing other revenues and increasing the share to agriculture. If this increased share is actually spent in agriculture, it will help, but major development will have to await overall budget relief and international assistance will play a dominant role in providing much of this relief.

b. The Ministry of Lands and Agriculture and Related Agencies.- The Ministry of Lands and Agriculture (MLA) was formed recently by combining agricultural sections from the former Ministry of Rural Development and the Lands Section from the Ministry of Lands, Natural Resources and Tourism. The Department of Agriculture, under MLA, includes the three divisions of Extension, Research and Land Use. An examination of the extension appears in Appendix D and elsewhere in this paper.

Under the Assistant Director for Research, a Chief Agricultural Research Officer directs the regional research stations. The major Agricultural Experiment Station is at Mount Makulu, a short distance south of Lusaka. Mount Makulu houses almost two-thirds (41) of the professional staff and over one-third (13) of the senior technical staff. There are eleven other rather small research stations situated throughout Zambia, though most are along the line of rail. The smaller stations tend to specialize, for instance, the natural Irrigation Research Station near Mazabuka and the Animal Husbandry Research Station in Mazabuka and Choma. A new research station to work on cereal grains is proposed to be established at Golden Valley about 50 Km north of Lusaka.

The government runs or controls much of the economic activity through parastatals, which are quasi-government corporations. The parastatal is

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[6] G.O.Z., The Current Economic Crisis, Government Response and Approach to the Third World Plan, May, 1978, pp. 6-9.

supposed to perform its services efficiently and earn sufficient revenues to cover costs. There is not the incentive to operate as a private business, however, or even the ability to do so, since government sets many of the input and output prices at levels which do not provide sufficient margin to cover costs, and losses can be covered from the federal budget.

Parastatal officials too are part of the problem, often acting as though finance were incidental to administration. The major parastatal affecting agriculture is the National Marketing Board (NAMBoard) under the Ministry of Lands and Agriculture. This agency is responsible for all marketing and storage of grains and supplying of inputs (fertilizer, seed and equipment) to farmers. Formerly NAMBoard included cotton and fruits and vegetables, but cotton operations including seed, fertilizer, insecticide, equipment, marketing and credit are now handled by a new division, Lintco. Zamhort was formed to provide services for vegetables and fruits.

The creation of Lintco in 1977 to assume all cotton operations may help both to stimulate cotton production and to relieve NAMBoard of part of its burden. Zamhort may help for fruits and vegetables, but the results of these two operations are not in yet. The contracting of trucking to private firms may relieve part of the NAMBoard maintenance and service problems. The latter may revive private entrepreneurship in trucking services, and have considerable benefit.

i. Constraints

The major constraints to research work are trained professional staff very little of this staff is Zambianized.* The equipment is antiquated and results are slow in reaching the field.

The sheer magnitude of the NAMBoard operation, the size of its bureaucracy, the need for skilled management and the number of tasks it performs made its operations cumbersome and inefficient if not almost impossible to run. Financial losses were built in by the price of maize and fertilizer.

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*(Of particular need at the present time are two professional staff members to work on soya beans production to be developed as a new unit at Magoye Station. New facility investment is needed for the Golden Valley Station as well as staff.)

The constraints of parastatal there are like those of trying to run a business without the real incentives of profit and loss, with a shortage of trained managers, and the difficulty of equipment and transport maintenance. Like other aspects of the MLA then, the parastatals are spread too widely without depth in management and services.

c. Price Control on Commodities. - Most food and crop prices are controlled by the government. Minimum producer prices are set annually by the government based on production costs and supply response. Where government or NAMBoard is the sole legal buyer, these minimum prices become the fixed price. This is particularly the case for maize, cotton and agricultural products where NAMBoard or Lintco are the only buyers. Input prices, such as fertilizers, are also set by the government and in this case too, the producer price was set below its cost, requiring a subsidy.

Minimum prices to producers and maximum price relief to consumers are set for a wide range of commodities, and are set uniformly throughout the country regardless of location or seasonal changes in supply. Prices have been below border prices or world market level, in effect imposing a tax on farmers. Dodge states that in rural-urban terms of trade in the post-independence period, the terms of trade have moved against the farmer, and that crop pricing policy has contributed to the poor performance of the agricultural sector.[7] In 1974, the government by its price policy in effect levied a tax on producers for seven major items of k16 million or 28 percent of gross value.[8]

In the last three to five years, producer prices have been raised for most agricultural products, and some rather dramatic production results have been attained (to be detailed later in the commodity analysis section).

1. Constraints

Pricing policy, however, continues to be a serious constraint to locational advantages, regional specialization, and transport and storage efficiency. National and regional response to the law of comparative advantage is hindered by set commodity prices. Geographically and seasonally uniform

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[7] Dodge, Doris, Agricultural Policy and Performance in Zambia, Institute of International Studies, University of California, Berkeley, 1977, pp. 128-9.
[8] World Bank, Report No. 841a-ZA, Vol. I, pp.15.

prices encourage production in more distant areas versus close-in areas than would otherwise be the case; discourage the conversion of more bulky or perishable products to those less so which would reduce transportation costs proportionally to the final price; provides no incentive for distant farmers to carry produce to central markets; provides no incentive for farm or village storage, thus burdening NAMBoard transport and storage facilities.

B. CULTURAL ASPECTS

1. Land Tenure Arrangements

The land area of Zambia is divided into State Land (formerly Crown Land), making up 6.5 percent, Reserves, 35.9 percent, and Trust Land 57.6 percent. The State Land, principally along the line of rail, was orginially set aside for European alienation and Reserves were set aside for exclusive use by Africans. Trust Lands were administered for the benefit of Africans but did not exclude European settlement. Half of the State Land was equally divided between freehold and leasehold, the other half was in township and other uses.

Land tenure on the Reserve Land and Trust Land under African control is by traditional and tribal custom. In a simplified explanation of a rather complex situation, customary law gives very secure possession of land to the cultivator once he begins using the land by permission of the headman or chief. Even if he clears the bush and takes the land himself, his possession is usually secure. This security of possession is very similar to fee simple ownership except that it is a life interest, expiring on decease, and that rights also expire after a period of abandonment. Inheritance differs by tribal custom, but generally some control reverts to the headman or chief who reallocates the land usually along the prevailing patrilineal or matrilineal line of decent. Abandoned land is also reallocated to new cultivators. The buying and selling of land for a cash consideration was evolving in areas that had a cash economy, and in some cases heirs were designated for this land.[9]

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[9] Tuthill, Dean F., Thoughts on Land Tenure in Zambia, unpublished paper, May, 1973.

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Land tenure has been the subject of considerable study by the government and various appointed commissions over the years. There has been concern for unifying the different tenure arrangements and for deciding what form of tenure was most compatible with humanism. Large, speculative, absentee land ownership units which emerging cash transactions could lead to, were undesirable. This effort led finally to, "The Land (Conversion of Titles) Act of 1975." This law states that any land held, "absolutely, or as a freehold or in fee simple or in any other manner implying absolute rights in perpetuity ... is hereby converted to a statutory leasehold and shall be deemed to have been so converted with effect from the first day of July, 1975." The land in itself has no sale value, value exists only in improvements. The leasehold is for 100 years for land officially surveyed.

The Act does not specify size of holdings, but does make provisions for setting a limit. "The Minister may, by regulations prescribe the maximum area of agricultural land ... which may be held by any one person at any one time for any specified purpose ..."[10] It also provides for an annual rent to be paid on the land, with a lease issued (with stated conditions) when the land is formally leased. It is not necessary to convert land to statutory leasehold until or as transactions or transfers of land occur or the lease period is expired.

The effect of the Act will not be evident for a number of years, as only small amounts of land were bought and sold at a price, and the term of 100 years will effect very few people presently holding land in their lifetime. It should be noted, however, that land not officially surveyed, as is most of that in Reserves and Trust Land, are leased for lesser periods, usually for 14 years. The terms of a lease provide far fewer rights and confer more obligations than a fee simple ownership or customary tenure.

a. Constraints

The constraint of land tenure on agricultural production is generally considered to be minimal at the present time. Over time, the leasing terms

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[10] Article 17 (1), Land (Conversion of Titles) Act, 1975. It is assumed the Minister means the Minister of Lands and Agriculture.

may become more onerous and restricted in use of the land, limitations in size may inhibit economics of scale, and as the best agricultural land becomes a relatively more scarce and valuable resource, the lack of a price may cause misallocation and inefficient use of this resource.

2. Women's Roles

Women have played traditional roles in Zambia's rural society, which are still very much in evidence in its rural villages. They prepare food and do all domestic chores, do a large share of the planting, cultivation and harvesting, especially of subsistence food crops. If there are no bicycles or carts available, they do all transporting of water, crops from the field and goods to and from market. Men drive oxen for plowing and transport, take more care of cash crops, and help particularly in planting and harvesting crops. Women are expected to not be assertive in public; to obey their husbands and respond to their wishes. Women were thought traditionally to need less education, and until recently, and still in the more remote areas, stop going to school at puberty.

a. Constraints

This traditional role of women is a constraint to development. Since they are often the principal, and sometimes the only cultivators in a household, they should learn more about care of both subsistence and marketed crops. At Farmer Training Institutes women, who attend in smaller numbers than men, receive training in home, garden and perhaps poultry care, when they should learn about varieties, fertilization and care of cash crops. Dr. Levine in his report notes the preponderance of women in the rural areas and the shortage of women in the extension services, in training programs, and in agriculture diploma and degree programs (Appendix C).

3. Population Control

Family planning or any means of birth control are practically non-existant in the rural areas, and of very little use, except among the more affluent, in the urban areas. Annual population growth in Zambia is about 3 percent, which means a doubling of population every 23 years. The population of Zambia was 4.9 million in 1975 and was estimated at 5.3 million in 1977. Forty percent of the population is urbanized, making Zambia one of the most

urbanized countries in Africa. The urban population growth rate was 5.7 percent in 1976, the rural growth rate was 1.6 percent and only 0.9 percent in the rural subsistence sector.

a. Constraints

The rather rapid growth in population is not a constraint to agricultural development. Indeed, there is some notion a labor shortage may exist or develop in the rural areas. This is a manifestation of outmigration, however, and a better balance of opportunities between rural and urban areas would help solve the problem if and where it exists. The tradition has developed for youth to leave the rural areas for work in the copperbelt or other urban areas -- now these opportunities are decreasing and many are unemployed or employed very unproductively in the urban areas.

The growth of population does require continued increased in GNP, food production, capital investment, education facilities, etc., just to maintain a given standard of living for the larger numbers of people.

C. ENVIRONMENTAL FACTORS

1. Land Use and Soils

About one-third of Zambia's 744,000 square kilometer land area is suited for agriculture. The other two-thirds is tsetse fly infested, in forests, or game preserves, (also included in tsetse fly area) or under water, rocky or otherwise unsuited for agriculture. The most fertile soils are in the Central, Southern and Eastern plateau areas of the country. These soils are less leached than northern soils and have higher content of loam. Maize, cotton and tobacco can be grown on much of these soils.

The soils of the northern areas are more leached with poor physical and chemical structure and low fertility. Much of the western area is covered with Kalahari sands, infertile and suited mainly for cattle. The Zambezi-Luangwa rift valley areas with escarpment and valleys are generally unsuited for agricultural production.

2. Temperature

In the areas of most productive soils, frosts seldom occur, and the temperature is moderate; cool in the dry season, hot just before the rains, and comfortable in the rainy season. The western area has extremes of heat and frost, and the valley areas have a hot, humid climate most of the year.

II. APPRAISAL OF EXISTING SUPPLY CHARACTERISTICS

A. LAND USE POTENTIAL

Zambia has a total land area of about 74.3 million hectares. Of this total, some 68 million is potentially arable land. As estimated 18 million hectares, however, is available for agriculture, and of this, a total area of 14 million hectares is intermittently cropped. Of this cropped area, only 2.1 million hectares are harvested annually. This represents less than 3 percent of the total arable land. As Mr. Darby states in report, Zambia "has land resources far in excess of those needed for the production of its own food crop needs."

B. LABOR INPUTS

As already mentioned, the supply of labor for agriculture is perceived to be critical at some places at certain times of the year. Certainly labor does migrate from the rural to the urban areas. Studies have shown that labor for hoeing and weeding during the growing season is most critical. Migratory labor is not evident as a labor supply for most crops and areas.

Wage rate differentials between urban and rural areas help explain the migration to the urban areas. In 1973, the mining sector had a wage rate of nearly k1500 per year, the manufacturing sector of about k850 and the agricultural (wage earner) sector of k376. Most rural cultivators earned in the range of from 50 to 150 kwacha cash income per year from all sources. All urban dwellers do not earn mining or manufacturing wages, but these provide a standard and an attraction. Security guards and house servants earn k500 or less, and many others are unemployed or underemployed.

1. Constraints

The labor constraint is due to the tradition of going for work in the copper belt or the city because of the imbalance of income and employment potential between the urban and rural areas. The dilemma for the GOZ is how to simultaneously raise the standard of living and incomes of those in the rural areas such that they remain without diminution of goods and services to the urban areas. Just how much income improvement and what kinds of

goods and services package are necessary to accomplish this are currently beyond the planning and research capacity of the MLA.

C. CAPITAL EXPENDITURES AND CREDIT

Over a period for good copper prices, foreign earning and domestic capital expenditures have provided a significant development in Zambia infrastructure. But capital expenditures have been hard hit by the recent economic crisis, and have fallen by about 30 percent from 1975 to 1977. This severely restricts development efforts. Taking inflation into account, real capital expenditures during the years 1975-77 were less than those of the late 1960's.* Capital investment is a real constraint and budgetary earnings is successful.

1. Constraints

Credit has traditionally been of limited availability in the rural areas. Tobacco schemes and Lintco for cotton, have furnished credit as part of the production program to be paid for out of sale of the crop. After a disasterous experience under a former credit agency (COZ) which made loans and terms too lenient, credit terms and availability were tightened. The Agricultural Finance Corporation (AFC) now provides credit to farmers at interest rates below the market price, but under more careful supervision. Small cultivators still do not have ready access to credit, and often borrow for production purposes from merchants or individuals at high rates or interest. Customary tenure, which does not provide deeded ownership of land, inhibits long-term credit as the land cannot be used as security.

D. TRANSPORTATION AND STORAGE

The size of Zambia and the distance of the Eastern and Northern Province agricultural areas from the line of rail make transportation an important factor in agricultural marketing. Since Independence a major road construction program provided macadam roads as at least a single link to all the

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*G.O.Z., The Current Economic Crisis, Government Response and Approach to the Third World Plan, May 8, 1978, pp. 5.

provinces and to external outlets. The border closing cut off the railroad to the south through Rhodesia, and the continuing struggle in Angola keeps the Lobita rail outlet closed. The Tazara railroad has been completed, and provides an outlet to the port of Dar es Salaam, but conjestion in this port causes delay in exports and imports for Zambia.

1. Constraints

The major constraints in the road system are the feeder roads connecting to the major road network. These are still largely gravel and dirt, subject to erosion during the rainy season and in need of constant maintenance which is often not provided. Dr. Kidder in her transportation report states that, "Roads are viewed by several observers as a principal bottleneck to developing agricultural production in several areas." (See Appendix B)

Transport was the first or second constraint mentioned in most interviews discussing problems of agriculture. There is a shortage of vehicles, but most notably, a lack of maintenance and spare parts. This is due in part to the forced reduction in imports to save foreign exchange and in part to lack of trained manpower to provide maintenance. A third problem here is that bilateral assistance results in a variety of machinery inputs whose parts are not interchangeable.

Storage, especially for maize, is mentioned as a continuing constraint. (Its trade-off potential with transportation storage capacity is covered under the crops section in maize). Permanent silo storage is in short supply and available only along the line of rail. Additional longer-term storage in the maize producing rural areas would decrease the strain on transport at harvest. At present, the time span necessary for moving the maize from temporary storage in production areas to permanent storage in order to prevent soilage is very short.

E. OTHER INPUTS

1. Fertilizer Use

Mr. Gerald M. Darby, Agronomist, SCS, USDA in his report as a SADAP soils specialist assessed the fertilizer needs in Zambia as follows:

Fertility needs - Fertility studies in Zambia appear to be adequate and give good indications of the fertility needs, with possible exception

of the very high rainfall areas.

1. Nitrogen - Nitrogen is the main fertilizer element needed. Ammonium nitrate is manufactured for use as an explosive in mining and is available as a fertilizer. The growing of legumes in rotation is encouraged. Most important legumes are groundnuts and beans. It is estimated that adequately inoculated legumes add to the soil nitrogen at annual rates equivalent to 100 pounds of ammonium sulfate. This would be true only if the crop residue were returned to the soil and not burned, grazed, nor removed for other reasons.
2. Phosphorus - This element generally is needed. It is imported, but there are sources in Zambia.
3. Potassium - Generally this is adequate in Zambian soils.
4. Other - Sulfur, boron, and other trace elements are needed in some soils.

2. Extension

The Extension Service provides information to farmers through a network of field staff, administration and training centers. In Dr. Levine's report it is stated that Zambia, "possesses an Extention infrastructure which has the potential to be one of the most effective in Africa."[11] There are however, many deficiencies in implementation and in delivery of services. In the UNDP/FAO paper, "Pilot project for the Extension Services," Appendix E it is stated in page 4 that:

> A number of constraints have hindered the effectiveness of the impact of the extension service -- in particular a lack of transport for the field workers to visit the farmers; the feeling of isolation and lack of recognition of their efforts in the more distant areas; in adequate housing and work incentives, particularly for the junior field staff; and, above all, the lack of sound training consistent with their needs and situation.

The report in detailing of the lack of training cites "an absence of systematic, frequent and comprehensive programme of training for Agricultural Assistants and Commodity Demonstrators, (and) lack of programmes of work with farmers." (pp. 5)

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[11] Levine, William T., "The Agricultural Education Sector in Zambia, Constraints and Opportunities," Appendix C.

F. MANAGERIAL DECISION MAKING

Decision-making in Zambia on the use of agricultural resources takes place on many small and a few large farming units. The agricultural sector is dualistic consisting of around 630,000 small units, mostly subsistence farmers, and about 800 commercial units of which some 350 are of Zambian origin. The subsistence farm families represent more than 60 percent of Zambia's population, and produce about two-thirds of total agricultural output while the rest comes from the few hundred commercial farms. Many of the subsistence farmers do produce some cash crops, and a number are emerging more and more into the cash economy.

1. Constraints

These numbers indicate the constraint -- or the challenge -- of reaching many small, often isolated, decision-making units by Extension and other services in order to encourage improved management practices. Traditional practices persist and are difficult to change, but a very real and rational aversion to new methods and new crops exists -- the risk of jeopardizing the family food supply, which has first call on resources.

At the other extreme from many small production units are large governmental agencies and parastatals. NAMBoard is one of the best examples of the latter, and responsible for many macro-decisions related to agriculture. At this level, the lack of trained manpower -- the thinness of the ranks for managerial decision-making, is very evident. The Ministry of Lands and Agriculture exhibits the same need for trained management. (Levine Report, Appendix C).

III. AGRICULTURAL COMMODITY SUPPLY AND DEMAND CHARACTERISTICS

In this section, information on production, consumption, price and imports-exports is given for the major crop and livestock products. Maize, oil seeds and beef cattle were selected for special emphasis as sectors with the greatest need and potential for increased production, import substitution to self-sufficiency if possible and/or export. Appendix Tables provide much of the detail data for these products.

The author concentrated more on crops and relied on a livestock specialist and the Animal Husbandry section of the Department of Agricultural, Ministry of Lands and Agriculture (MLA) for livestock data. The latter also provided valuable information on development schemes. Appendix Table I gives the gross value of the major agricultural, Forestry and Fishery products to show their relative importance.

Data on crop production are not difficult to obtain, but the most reliable source is difficult to ascertain. There are about as many different figures on production as there are sources, with mostly minor, but some major differences. Some rather obvious typing errors were noted in some sources. Other differences were difficult to reconcile, and generally the production data used and given in Appendix Tables were the latest available from the Statistics Section of the Ministry of Lands and Agriculture selected after checking with the Chief Crop Husbandry Officer in the Department of Agriculture, MLA. It is hoped there will be no errors in the data, and that it will be as up-to-date and reliable as possible.

A. MAIZE

1. Production

Maize is the most important food crop in Zambia consumed directly as cooked meal (Nshima) by many Zambian families as the main part of each meal every day and accompanied by relish (meat and gravy, vegetables or leaves) as these are available. Maize also provides for local beer-making and some by-product animal feed. Marketed production has been increasing with some fluctuations since 1964 (Appendix Table II). The 1970 crop was exceptionally small (135,200 tons marketed) and the 1972 crop largest to that time (over 600,000 tons). Since 1974, each year's marketed production has been above 500,000 tons, and in 1976 it reached an all-time high of 749,972 tons, declining slightly in 1977 and further to an estimated 657,000 in 1978.

It must be noted, however, that the marketed production is a small part of the total amounts of maize produced in 1977. Maize was harvested from an estimated 1,130,000 hectors (2,792,238) making up 56.1% of all harvested crop area and providing 2,540,000 tons of

maize. Thus, the marketed production of about 696,000 tons of that year, was a little over 27% of the total crop.*

In round figures, about 70-80% of the total crop is consumed (as food or beer) on the farm where produced, though some is very likely bartered or traded among small farmers. This subsistence portion is not, however, all produced on subsistence farms. Practically all small, emerging, and even larger Zambian farms produce for their own needs and most of them have some or even substantial amounts to sell. This rural subsistence demand is not increasing as fast as overall demand due to urban migration; it remains more nearly a constant amount. Thus, increases in production provide not only a larger total crop but a larger proportion can be marketed. Accordingly, if it is assumed that the total crop increased from the 1977 level by 2%, and 30% of this crop were marketed, the increase in marketed production would be over 6%, and slightly more if a larger proportion of this increased crop were marketed.

The estimated market demand for maize for 1974 (World Bank Report 841a-ZA, Annex 5, Tables 1-8) was 428,200 tons which was more than met by the marketed product in that year, though production has to be greater than consumption to cover some losses. The market demand estimated for 1980 is 608,300 tons, which would be met by the average production of the past five years (approximately 650,000 tons). The marketed demand estimated for 1995 is 1,550,200 tons, more than double present marketed production. This would require over the 50 year period an annually compounded increase of about 5% per year in market production, or initially a 30-35,000 ton per year increase (gradually increasing). The average increase for 1964-68 (280,000 tons) to the average of 1974-78 (650,000 tons) was an annual increase of about 8-10% over the ten year period. Past performance indicates

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*The Year 1977 was the only year found which seemed to have fairly accurate figures for total and marketed maize production as a basis for the marketed percentage. Total crop data is very much an estimate and unreliable. However, crop production officers felt that about 20% of the total crop produced in the past had been marketed. Thus 80% was consumed on the farm or did not reach the marketing channels. World Bank Report 841a-ZA, Vol.2, Annex 5, pg.5 gives a figure of 57% of total production was being marketed in 1974. These figures are for maize meal produced and marketed. The source of this data or the relationship of maize meals to maize production is not known. This 57% figure was apparently picked up in a more recent publication and used as a divider to obtain total maize production from the marketed production. This is believed to be erroneous. The Report 841a-ZA later dwells on the unreliability of maize production figures, and even suggests some errors on the low marketed report of 1970, saying census figures show this was not such a short crop. (Annex 3, Appendix 1, pg. 12). The marketed figures of 20-30% increasing as the size of crop increases, will be used here.

the 1995 goal is attainable. Also, of course, a 5 percent per year increase in marketed production would require less than a 2 percent increase in total production, even less if an increasing proportion of the total crop is marketed. This increase seems entirely feasible, on the average, but weather uncertainty has to be considered.

2. Price

The price of maize since 1964 is listed in Appendix Table III. Before the 1974 crop, price was differentiated by place of delivery. Since 1974, the price has been uniform throughout the country, differing only by grade. In 1974, the price was raised from k4.30/90kg bag to k5.00 grade A, and increased to k6.30 in 1975 and to k6.80 in 1977.* The consumer price was below the producer price for all of these years. In 1976, the producer price average for grade A and B was k5.25 per bag, but the consumer price was k4.82. This resulted in a subsidy to consumers in this year of 21.7 million kwacha. The subsidy was supposedly eliminated for this marketing year (1978/79), but the new consumer price was not obtained.

3. Storage

At present there is storage capacity of 855,000 tons of maize; 108,000 tons in concrete silos, 126,000 tons in sheds with corregated sides and top (stored in bags) and 621,000 tons on concrete slabs with tarpaulin covering. There has been no additional space added since 1975, but most concrete slabs are constructed so that corregated roofs can be added. This storage would provide for any one crop produced so far with an excess of some 200,000 tons (except for the 1976 crop) for carry over. However, the concrete slabs are considered temporary storage; much of it is located in the rural depots and maize should be moved out of these areas within six months or damage will occur. Storage is thus barely adequate and only a small portion is suitable for long term storage. The silo storage is also located on the line of rail, mainly in Lusaka and the copperbelt. Some silo storage in strategic outlying areas could reduce the transport requirements for bringing to the line of rail (and return of meal) and provide for potential grain exports to the south, east and west as borders open up and needs develop.

4. Imports and Exports

In most years some maize has been imported, but it has diminished since 1971. The poor 1970 crop required imports in 1971 of 262,000 tons valued at over 18 million kwacha. The next year with a much larger crop saw a decline to 6,300 tons costing over k3 million. The large crop of 1972 required no imports, and since then imports have been minor except for 401 tons costing k41,000 in 1977. This is strange because the 1976 maize crop was the largest on record and exports in 1977 were large. The in- and out-flow is normal, however, to meet local or periodic needs.

*Footnote: See next page.

* Some measure of costs of production are essential to serve as a guide for determining if the prices being set are adequate to cover, but not above, long-run costs. Doris Dodge in her book, "Agricultural Policy and Performance in Zambia" uses shadow prices which would be equal to the market price under conditions of pure competition with no subsidies or taxes imposed. In this case, the shadow price or market price would equal all long-run production costs. However, these conditions do not prevail in Zambia, if indeed, anywhere. In this case, Dodge uses world price for tradable goods as the shadow price, and through use of a formula with recognition given to trade quotas and taxes, arrives at a domestic resource cost (DRC) (p.15). The technique and its results are very appropriate to be considered as a guide, along with other factors, to the Zambian government in setting prices. As Dodge states, the government may use shadow prices as a basis for setting domestic prices, or "can employ alternative policy instruments to ensure that the resulting resource allocation is identical to that which result from the use of shadow prices as market prices." And also, "The ideal procedure would be to remove all distortions and market imperfections so that market prices and shadow prices would be identical." With this reference to the desirability, even the necessity, of determining costs as the basis for prices, prices of products will be reported as they exist, or are set. The attempt to determine production costs for each commodity is beyond the scope of this report.

Maize exports have occurred since 1971 being about 8,600 tons valued at k177,000 in that year. The 1973 export was slightly over 50,000 tons valued at k2.6 million and increased in 1974 following two good crop years to 111,210 tons valued at k7.6 million. Exports decreased substantially in the next two years, but increased to 25,606 tons valued at k3.5 million in 1977 following the large 1976 crop. As noted, imports also occurred in this year. The declining crops of 1977 and 78 (though still large by pre-1972 years) will cause decreases in exports and may bring imports.

B. GROUNDNUTS

1. Production

Groundnut production has fluctuated rather drastically since 1964 (Appendix Table II). Production hit a peak of 14,810 tons in 1967 and dropped almost immediately to almost one-third of this and to a further low of 3,270 tons in 1970. There has been some recovery from this (except for a similar low in 1973) to 9,476 tons in 1976. The reason for such fluctuations are not apparent except as due to weather and to farmers response to prices, both for groundnuts and for competing crops.

Groundnuts are produced almost entirely by traditional small farmers and stored in mud and pole or bamboo storage bins in the village. There are two types of groundnuts, the Chalimbana or confectionary nut produced for local food and export (largely in the Eastern Province), and the oil-expressing or red nut used mainly for subsistence consumption, and more recently for oil production. A limited acreage is grown, usually a half a hectare more or less, because the crop is demanding of labor for lifting and shelling.

2. Price

The price of groundnuts, similar to maize, varied by location until 1972, although prices were similar except for higher prices on the line of rail. Prices varied from k9.00 to k10.20 per 80 kg bag until 1973 for the oil-expressing nut and from k8.00 to over k10.00 for the Chalimbana, the difference being due more to the location of the Chalimbana in the Eastern Province than the type of nut. The price was raised to a uniform k12.60 per 80 kg bag in 1972/3 season for all locations for both types of nuts. The grade A price was raised to k17.00 in 1973/4 (one kwacha lower price for grade B nuts) and to k25.00 in 1975/6 (lower for grades B and C) and to k28.60 for the 1977/8 crop. The rather abrupt rise in 1973 appeared to be in response to declining production, and appeared to stimulate production initially until it fell again despite increasing prices in 1977 and 1978. The increasing price of

maize starting in the early 1970's appeared to bring substitution of this crop for groundnuts, and perhaps the latter price was still not high enough to compete with maize (or cotton) in the recent two years. 30

3. Exports and Imports

Some groundnuts were imported in 1972 following the small crop of 1970-71 (28.5 tons valued at k p5,000). No further imports occurred until 1976 when 1,251 tons costing 117 thousand kwacha were imported. These were unshelled, and another k75,000 in shelled nuts were imported. This was in spite of large crops in 1975 and 1976. Neither production nor imports were listed by type of nuts, however, it can be assumed that imports were mainly oil-expressing nuts, and exports the confectionary nut. The recent imports were largely from India. No imports were recorded in 1977.

Shelled groundnut exports were more consistent than production ranging from 2500 to 3600 in 1971-73. These were confectionary nuts whose production may also have been more consistent. Exports dropped 1300-1800 tons from 1974 to 1977 except for exports of 2,715 tons in 1976 valued at over one million kwacha. Groundnuts have been a rather consistent, though small, earner of foreign exchange.

C OIL SEEDS

Oil seeds are valuable for the production of both oil for human consumption and the by-product meal for animal protein concentrate feed. Both of these products are heavy import items for Zambia. The major Zambian crops, producing both oil and meal, are sunflower, soya beans, groundnuts and cotton seed. Maize germ can also be used to produce oil with little loss in food value if the germ meal is returned to the meal, and the bran and other parts of the maize kernal (or all of it including the cob) can be used for feed. Fish also provide high protein meal, as do slaughter by-products and even chicken litter. Maize was studied mainly as food rather than feed, and fisheries were not considered part of the agricultural sector.

1. Sunflower

Sunflower has been grown as a traditional crop in some parts of Zambia over a long period of time, but was eaten or fed on the subsistence unit. The marketing of the crop for edible oil and by-product cake occurred in a small amount in 1969 and again in 1971. The marketed production increased rapidly from about 16 tons in 1971 to over 4,000 tons in 1974, doubled in 1975 and almost doubled again in 1976 to 15-16,000 tons (Appendix Table II). The 1977 crop declined to 12,207 tons and production is estimated to be only 8,850 tons for 1978. The recent decline after such a rapid increase is disheartening. The weather was adverse for sunflower in 1977

31 and this may have discouraged planting in 1978.

The price of sunflower was k4.62 per 50 kg bag in 1970/71, about double the previous years, was increased substantially to k6.64 in 1972/72 with a further increase to k10.00 in 1975/76. The price was again raised in 1977/78 to k12.50. The decline in production 1977 and 1978 does not appear to be a lack of price incentive. It is hoped the decline is an aberration, and the upward trend since 1971 will continue after this year.

2. Soya beans

Soya beans are a new crop, just recently marketed in Zambia. The first marketing was reported in 1973 at 173 tons, increasing fourfold to 683 tons in 1975. The increase continued to over 1300 tons in 1976, a slight decrease in 1977 and the estimated crop for 1978 is 1400 tons.

The price of soya beans rose from k3.20 per 90 kg bag in the late 1960's to k8.40 in 1970 with another increase to k13.20 in 1973. Prices continued to increase substantially, to k17.00 in 1975 and k21.50 in 1977. The increasing prices from 1970 onward seem to have had the effect of stimulating production.

3. Groundnuts

Groundnuts (the red or oil-expressing nut) are also used for oil and cake, but the production by confectionary and oil type are not listed separately, thus the production of oil type is not known. It is suspected that only small amounts of the oil expressing nuts have been marketed, and it was assumed that imports of groundnuts were for oil and cake production.

4. Cottonseed

Cotton seed is, of course, a by-product of the production of lint from seed cotton. As will be noted later, seed cotton production has increased in recent years to an estimated 12,000 tons in 1978. Seventy percent of seed cotton by weight is cottonseed so this would provide about 8,400 tons of seed, or about 7,000 tons of meal and 12 - 1400 tons of oil.

5. Summary on Oil Seeds

These oil seed crops can together fill a void in Zambian agriculture for oil and cake production, as well as providing food, fiber and litter or mulch products. They are generally complementary products, filling niches in farming operations. Sunflower, groundnuts and cotton are traditional Zambian crops grown on small farms largely with hand labor, and will compete somewhat for labor in the harvesting season. Sunflower are more easily harvested and thrashed by hand than are groundnuts. The oil can be efficiently extracted by the expellor (mechanical) process to a cake with 6 - 7 percent

oil remaining. Hybrids have been developed which yield up to 3 tons per hectare and contain 42 percent oil. They can provide more oil per hectare than any of the oil seed, but sunflower meal lacks sufficient lysine for a balanced amino acid protein feed, as do groundnut and cottonseed cake. The sunflower, as cotton, is a heavy and deep feeder, and requires fertilization.

Soya beans, on the other hand, generally require mechanization and capital investment for planting and harvesting and therefore fit best on large, commercial farms, though cooperative associations could provide machinery for emerging commerical farmers. Soya beans are well suited for a rotation with irrigated wheat on commercial farms as they can be harvested early for wheat planting. They are also a legume (as are groundnuts), and therefore with proper treatment of the seed, can fix nitrogen in the soil. Treating the seed is an exacting process requiring the skills of a commerical farmer.

Another major advantage of soya beans, shared with fish or animal protein, is that soya bean meal has about 6.4 percent lysine. If soya bean cake makes up about 50 percent of the protein concentrate, lysine is sufficient for a balanced animal ration.

The drawback to soya beans is that they are not an efficient oil producer by the expellor process and for economic oil production require the solvent (chemical) extraction process. Thus, the production has to be on a large enough scale to justify building a solvent extractor plant which requires import of the equipment and solvent and trained operators.

To an efficient oil producer, and to provide adequate incentive, soya bean production would require[12]:

1. A solvent extracting plant.
2. A higher price the soya bean meal cake than for other meal cakes in recognition of the higher protein quality, and
3. A higher price relative to maize for the producer so soya beans will be a viable substitute for maize on commercial farms.

Production of all of these oil crops should be encouraged on commercial, emerging or small farms, as they fit the land, labor and capital resources. About 70 percent of the oil needs of Zambia are imported, and thus slightly over a tripling of domestic oil production would bring self-sufficiency, though future increases in demand will require continuing increases in production. Self-sufficiency in oil would also provide approximate self-sufficiency in stockfeed, of which 90 percent of the ingredi-

[12] Information from Dr. Sindhu, Oil Seeds Officer, Ministry of Lands and Agriculture.

ents are now imported.

D. COTTON

1. Production

Cotton has been produced since the early 1960's in Zambia, mostly on small farms, for a cash crop. From 1,649 tons in 1964 the crop increased to a peak of 12,053 tons in 1971. Then began a decline in production to a low in 1975 to 2,636 tons. Production has since recovered to an estimated crop of 12,000 tons in 1978. Decreasing production in the early to mid 1970's was caused mainly by the increasing price of maize and newly introduced hybrid maize which replaced cotton as a cash crop, particularly in the Eastern Province. The 1978 estimated 12,000 ton yield, in fact, exceeds the capacity of the Kafue textile mill which is about 10-11,000 tons per year. However, the third development plan calls for expansion of milling capacity to 40,000 tons of seed cotton by the end of five years, so continued increases in production can be absorbed in time.

2. Price

Originally, the price of seed cotton varied by grade and location. The price increased from k.14 per kg. (Lusaka ginnery) to around k.15 to k.17 in 1972. Then, in recognition of the declining production, the price was raised to k.22 to k.25 per kg. in 1973 to k.37 to k.42 for grade A in 1975 (with differences by location). In 1977 the price was set uniformly throughout the country at k.46 for Grade A cotton. The increase in price apparently made cotton competitive with other crops and resulted in sharp increases in production. In fact, it is estimated that at k.46 the price of seed cotton is more favorable, on an equivalent value basis, than any other crop, including maize, and may begin to replace other cash crops. Until the mill capacity is increased, this could cause an inbalance in production (and maize must have a priorty position) so that either cotton or other prices may have to be adjusted.

3. Exports - Imports

Cotton was exported in 1972 after the large crop of 1971 exceeded the milling capacity, but through the mid-1970's, about 60 percent of requirements had to be imported. Recent import figures are not known, but imports should not be needed in 1978 with the large estimated crop, in fact there could be some export of cotton until the milling capacity is increased. The 40,000 ton future capacity for milling would require greatly increased production or a return to imports.

E. WHEAT

1. Production

Wheat is a very recent crop with no reported production until 1975. In this year, 10.4 tons marketed production was reported, increasing to 43.9 in 1976 and 59.1 in 1977. Estimates are not yet available for 1978 as the irrigated crop is not yet harvested (July, 1978). The crop being marketed is from irrigated acreage planted about April-May (after the rainy season) and harvested in August-September. Rain-fed wheat is being produced experimentally, It is planted in the latter part of the rainy season, about February, and would be harvested in the early part of the dry season. This rain-fed crop would not have the technical and capital requirements of irrigation, but the risk from disease and rainfall (both quantity and duration) would be great. The Canadians are experimenting with this crop in the Northern Provice where rainfall and soils are more favorable -- similar climatically to the rain-fed crop produced in Tanzania. Either type of production would be on a larger scale, mechanized basis though rain-fed wheat, if successful, would be more adaptable to the larger emerging farms.

2. Price

The price for wheat was k7.50 per 90 kg and in 1972/73 and 1973/74 but increased to k16.00 in 1975/76 and k18.00 in 1977/78. This shows an apparent government interest in and support of wheat production.

3. Import

The government is interested in domestic wheat production because of the increasing demand for bread and other pastries by an urbanizing and more affluent populous. Demand increased from 16,000 tons in 1964 to more than 100,000 tons in 1975. Importation of wheat was valued at k13,239,554 in 1975, more than half of the overall foodstuff import cost of k23,705,278[13] (this was 64 percent of total foodstuff imports with minor imports not reported). Thus the interest of the government in wheat production for import substitution can be seen.

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[13] "Transition in Southern Africa -- Zambia," Southern Africa Task Force, Office of Southern and East African Affairs, African Bureau, USAID, Feb. 1977, Table IV-10, p.IV 19.

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F. RICE

1. Production

Paddy rice has long been a minor subsistence crop on small Zambia farms in certain areas. Low level swampy areas in the Northern and Luapula Provinces are natural production areas for rice. Marketed production was recorded first in 1968 and has increased each year, going from 46.6 tons in 1969 to 260.3 tons in 1972. In 1975 production increased to 1,008.7 tons doubled to 2,093.0 tons in 1976 and after a slight decrease in 1977, is estimated to be 2,680.0 tons in 1978. This is a rapid growth, and the reasons for this growth were not probed. Some schemes with donor help have been carried out in the Northern and Luapula Provinces and increases in acreage and yields have occurred. Flood control and irrigation in flood plains and river valleys could provide additional production -- particularly mentioned are the Barotse Flood Plain and the Kafue Flats.

The demand for rice, due again to an urbanizing and more affluent populous, is increasing rapidly. It was estimated to be 8,000 tons in 1976, almost double the previous year and is expected to increase to 15,000 tons by 1995.

2. Price

The price of paddy rice increased from k4.62 per kg, in 1970/71 to k8.95 in 1973/74. Increases continued to k10.00 in 1975 to 1977 and for the 1977/78 crop year, price was set at k12.50. These increases appear to have been an incentive for increased production and marketing.

3. Imports

Imports make up about 80 percent of the rice supply in Zambia even with recent production increases. These imports are mostly of polished rice from Malawi. Production appears to have been peaking in the last two years, as yet a long way from self-sufficiency. Continued increases should be encouraged and opening up production in new areas with flood control and irrigation may provide a potential for self-sufficiency.

G. SUGAR

1. Production

Sugar cane production started in 1968, being produced entirely on the Nakambala Sugar Estate. Production increased from 181 thousand tons of cane in 1968 to around 800 thousand tons in 1976. The country is supposedly self-sufficient at the present

time, but phenomenal increases in demand are projected -- from 76 thousand tons of sugar in 1974 to 105.9 in 1980 and 241.7 thousand tons in 1995 (World Bank Report No. 841a-Za, October, 1975, Annex 5, p.7). A second sugar estate is being planned to meet this demand.

2. Imports

Sugar and sugar preparation imports do occur, averaging about 1.5 million kwacha from 1971 through 1974. The 1975 cost did drop to .6 million kwacha, though it is not known whether this is a downward trend or a one-year drop.

H. TOBACCO

1. Production

Virginia flue cured, Burley and Oriental tobaccos have been and are being produced in Zambia. Oriental tobacco disappeared, at least in data reporting, after 1971, but reappeared at 1394 kg in 1976. Tobacco was a major colonial crop, and was one of the main reasons for European farmers taking land in Zambia along the line of rail and in the Eastern Province. Virginia tobacco declined from nearly 11,000 tons in 1964 to a rather constant 5-6,000 tons up to the present. Production of Burley tobacco was similar, decreasing from nearly 2,000 tons in 1965 to a low of 240 tons in 1967. Some recovery occurred beginning in 1971 to a crop of 500 tons in 1975, but then decreased again to 212 tons in 1976 and an estimated 312 tons in 1977.

2. Price

The price of Virginia tobacco, the only available price, was k.90 per kg. during the 1970's and increased to k1.04 in 1975, remaining at this level to the present. The governemnt doesn't appear, therefore, to be pushing tobacco production by price incentive.

3. Exports

Tobacco has been a major agricultural export by value over the years since colonial times. It earned k8,500,000 in exports in 1965, a peak of k12,789,000 in 1967 (in spite of a low crop), but declined to around three million kwacha from 1970 through 1972. Recovery occurred to around five million kwacha in 1973-76 and a high of 5.8 million kwacha in 1977. The major portion of this return in most years was from Virginia tobacco.

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I. FRUITS AND VEGETABLES

1. Fruits

Production of fruit crops are increasing, but do not yet meet local demand. Small village cultivators (and even urban and compound households) produce mangoes, avacados, bananas, melons and pawpaws which appear on local markets in season. Bananas, citrus fruits, pineapples and strawberries are produced commercially. All fruits marketed increased from 5,600 tons in 1971 to 6,850 tons in 1976.

2. Vegetables

The quantity of marketed vegetables has ranged from 20,000 to 28,000 tons from 1971 to 1976, with no trend, except the peak of 28,000 was reached in 1976. Substantial production occurs around urban markets, and generally -- if sporadically -- meets local demand. During the rainy season, when disease and fungus problems are greatest, the major supply comes from large-scale commercial farms. During the dry season small producers (and households) have watered plots for production and marketing. During early July, 1978, the variety and quantity of vegetables; beans, peas, carrots, potatoes, cabbages, lettuce, tomatoes, etc., available in the local markets was amazing. Pick-up truck loads of produce from small farms could be seen daily coming in to the markets. Transport deficiencies in vehicle and local feeder roads is constraint in local marketing of vegetables.

3. Prices

There are namboard price quotations for fruits and vegetables, and in the markets, prices seemed to be uniform and fixed, though bargaining can occur. The author felt concern for a deteriorating, perishable product if prices could not be adjusted downward toward the end of the day. Prices were high for lower income Zambian urban consumers, and discounts for left-over products would benefit these families.

4. Imports and Exports

Some fruits and vegetables are exported, fluctuation from 2,000 to 28,000 kwacha from 1971 through 1975. The make-up of these exports was not listed. Imports of fruits and vegetables are larger and more consistent from around 2 to 2.9 million kwacha from 1971 through 1975. Again, the make-up of these imports were not reported, but they probably consist mainly of fruit.

One of the major constraints noted in vegetable production was the availability of seed. The supply was usually present, but not always available at the time and place needed. All vegetable seeds for commercial purposes are imported into Zambia. It is believed that Zambia can produce much of the vegetable seeds it needs, and

various agencies and donors, including the Mount Makulu Research Station, are working on this problem.

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J. CASSAVA

Cassava is the only traditional non-commercial crop to be examined. Fairly high percentages of the crop are sold in local markets in certain areas. Forty-six percent of the crop grown in the Copperbelt is sold, 30 percent in the Eastern Provinces, and 19 percent overall (1969-70 data). About 176 thousand tons in meal equivalent were produced in that year from 162 thousand hectares.

The Zambian cassava crop grows slowly, yielding 10-15 tons per hectare (tuber weight) only after two to three years of growth. Cassava is an interesting crop in that it will grow under more adverse conditions than maize, remains in natural ground storage over a period of time, and can be substituted for maize as a raw root, as dried chips or as flour, and is used like maize in the preparation of nshima. Hopefully, cassava will not be needed to allay a maize shortage, but it is good insurance to encourage continuation of a base of production, both as a fall-back crop and as a viable product in its own right. The United Kingdom is supporting a study team from Britain to examine the feasibility of expanding use beyond subsistence. It seems a worthwhile effort to gain insights into a very traditional but potential valuable crop of small village cultivators.

K. BEEF CATTLE

1. Production

The beef cattle sector is considered to have great potential for expansion to meet Zambia's needs. It is believed the natural resources for beef production in Zambia give it a comparative advantage over surrounding countries, even as independent Zambabwe, for economic import substitution and even eventual export. Due to the importance and potential of this sector, a livestock specialist, Dr. Dee L. Cross, gave it special consideration and his report is in Appendix B. Appendices following this report give a wealth of statistical information from 1965 through 1976 on beef cattle. Production data will not be repeated here, and only a few highlights on prices and imports will be covered.

2. Prices

Cattle pricing is identified as a critical issue. The price is not fixed at the producer level, but a ceiling is set on wholesale and retail meat prices. With the current shortage of cattle in Zambia (import of live cattle have been prohibited since December, 1975), the result was that the Cold Storage Board (CSB) abided by the whole-

sale price ceiling and could not pay as much as independent butchers for live cattle. Therefore they could not obtain enough meat to supply local butchers. This situation was apparently reversed when a higher price ceiling was set in November, 1976. During 1977, the numbers slaughtered by private butchers fell while CSB slaughtering rose.

Minimum producer prices, with the recent increases, are given below, but the actual prices received by farmers in sales to either the CSB or independent butchers was not ascertained It is assumed that CSB would not pay much above the minimum price.

Cattle Prices in Ngwee per kg. of Live Weight

Grade	December 1974	November 1976	September 1977	Percent increase in 1977 prices over 1974
Choice	39	52	65	67
Standard	31	42	50	61
Commercial	20	31	40	100

Thus prices have increased substantially as an incentive for increased cattle marketing. Wholesale and retail prices must have been raised commensurably so that CSB could attract and sell more cattle.

3. Imports

Cattle imports during the early 1970's supplied about one-third, by number of head, of total slaughter in Zambia. This was a decrease from about 50 percent in 1969 and in 1975 only about one-fifth of slaughter was imported. The import of beef cattle was banned in December, 1975 to stimulate local production. No carcass beef has come in since this date, but boxed boneless cuts have since been flown in from Botswana. (World Bank Report No. 841a-ZA, Vol.II, Annex 8, Appendix IV, p.4, October 20, 1975)

4. Slaughter

With the elimination of imported animals, the number of head slaughtered has decreased from 105 thousand head in 1974 to 78 thousand in 1976. This indicates the decrease in consumption which has had to take place. CSB has a slaughter capacity for 148,000 head annually but it slaughtered under 19 thousand head in 1976 and slightly over 23 thousand in 1977. Thus, limitation on and potential for increased beef consumption lies in increased domestic herd and greater off-take from this herd.

L. DAIRY CATTLE

1. Production

Dairy herds, farms and cows have declined since Independence, mainly because of the exodus of expatriate farmers. Data on this are presented in Appendix C. Prior to independence, enough milk was produced so that 45 percent of the supply was converted into cheese and butter. It is fairly safe to assume that little of this was consumed by native Zambians. Fresh whole milk sold to the Dairy Produce Board (DPB) has declined from 17-18 million litres in the mid 1960's to about 12 million in 1975. Meanwhile the demand for milk has increased from 20 million litres in 1966 to 45.6 million in 1975 and is expected to be over 50 million litres in 1977 and 1978. The increase in demand has been due to emphasis on improved nutrition for all Zambians through "cheap milk schemes" and because of increased incomes of the urbanized population.

2. Price

The producer price of milk has been low to encourage consumption, and has been one reason for the decrease in production and exit of some commercial herds. Some dairy farmers found it economically expedient to shift to beef cattle. The producer price of milk has been increased from 15 ngwee per litre in 1976/77 to 21 ngwee in September, 1977. The retail price for fresh long-life milk is 32 ngwee per litre and recombined long-life milk is 22 ngwee.

3. Imports

The difference between fresh milk consumption and production is made up by imports of milk powder and butter oil which are reconstituted into fortified milk products. The total sales by the DPB have been made up of a little over 60 percent fortified milk in 1970 to about 75 to 80 percent in 1977 and 1978.

M. PIGS

Little research was done on pig production since Zambia is self-sufficient in pork supplies. Before Independence, marketing of pigs was done entirely by expatriate commercial farmers, concentrated along the line of rail. Since then, pork production has spread out to smaller farmers, and the Eastern Provinces has the highest population of traditional pigs. Domestic marketed production has increased from 32,835 in 1972 to 54,145 in 1976. Imports of pork and pork products was stopped in 1976.

N. POULTRY

Data on chick, poultry meat and egg production are included in Appendix C. Growth in all three areas had been tremendous in recent years, and Zambia is self-sufficient in poultry. The number of day-old chicks increased 20.5 percent per annum from 1969 to 1976, and some are now exported. Chicken production increased from 650,000 in 1964 to 7.6 million in 1974. Most of this production is by commercial producers near urban areas, but cooperative and settlement schemes are moving production into rural areas. Egg production has increased from 101 million eggs in 1970 to 209 million in 1975.

The only limitation on poultry production, and apparently a serious one during this past year, was a shortage of high protein stockfeed. Poultry feeds accounted for nearly 80 percent of stockfeed production in 1977 with pig feeds next at 17 percent. The problem has been off-loading in and transport from the part of Dar es Salam of fish meal. This situation was addressed in the oilseed section (the need for domestic stockfeed production) and is a vital concern for Zambia to tackle.

O. FISHERIES

Fisheries were not considered as part of the agricultural sector and were consequently not delved into in this study. However, fisheries are an important sector, worthy and in need of study and support. The high quality protein of fish products is needed in the Zambians diet, and if fish by-products could be processed into meal, it would be another excellent source of protein and especially lysine for stockfeed.

IV. POTENTIAL AGRICULTURAL SECTOR STRATEGY COMPONENTS

A. ASSUMPTIONS

A long-term strategy for agricultural development in Zambia requires some assumptions as to future conditions and relationships. The present economic conditions, especially the uncertainty of copper prices and the political upheavals on the southern border make long-term projections especially precarious. Nevertheless, long-term planning has to be done, and has to be predicated on certain assumptions.

Proposed assumptions are:

1. That copper cannot be counted on as a consistant source of foreign exchange, and that earnings will not recover to levels they have been in the past.
2. That the Rhodesian-Zimbabwe conflict will terminate with the establishment of Zimbabwe under African majority rule.
3. That the commitment of the Government of Zambia to agricultural and rural development is real;
    a) the improvement in terms of trade for agriculture will continue, and
    b) the increased budgetary allocations to agriculture will be implemented and future budgetary allocation will be favorable.
4. That small Zambian farmers will continue to be the backbone of agriculture, and will increasingly emerge as participants in the cash economy.
5. That larger scale commercial farmers will continue to produce crops suited to large scale operations, but will not dominate agriculture.
6. That leasehold arrangements will continue as the land tenure structure but will seriously alter the traditional freehold or customary tenure relationships which have guided decision making in the use of land.
7. That the land resource base will be sufficient to meet Zambia's food needs and provide for exports.
8. That water for irrigation is somewhat uncertain and may be limited.
9. That labor incentives rather than capital intensive methods will predominate* because of:

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* There was not unanimity on this issue among team members. Some felt that Zambia's relatively abundant land and small population made a mix of small holders and larger, more mechanized holdings a good possibility.

a) the availability and relatively low cost of labor versus capital,
b) Foreign exchange and domestic budgetary limitations, and
c) increasing costs of imported energy sources.

The first two assumptions lay the basis for the third one. If copper foreign exchange earnings cannot be counted on, then a commitment must be made to reduce imports and increase exports. Agriculture appears to have the greatest potential for this role. The establishment of a majority ruled Zambia raises serious trade uncertainties, but it appears that the compaiative advantage of Zambia in southern African and world markets may shift in favor of agricultural versus manufactured products. The natural resources and rainfall, and a commitment by the government, could give Zambia a competitive edge in the production and export of certain agricultural products.

The commitment of Zambia to the agricultural rural sector is not a certainty that follows from the first two assumptions, though it is made more necessary by them. In the past, commitments have been made for rural development, but as the amount spent did not come up to the budgetary allotments, projects were started and aborted or left to wither. The commitment has not seemed real, perhaps rationally so as long as copper could provide foreign exchange for imports of food and other sectors had greater needs or more political power.

Small farmers do have a large productive capacity and potential. As illustrated in the case of maize, entry into the cash market, even in a small way by several hundred thousand small farmers can mean major increases in marketed products. On the other hand, commercial farmers cannot be neglected because of their potential for producing certain more capital and technology intensive crops which are needed for import substitution, and which can be feasibly produced in Zambia.

Leasehold arrangements as provided under the Land Act of 1975 are given considering the present and foreseeable political climate, and do not appear to provide a serious constraint to agricultural development.

Natural resources are adequate for a fair range of, but not all, agricultural commodities. At the present it seems that future planning need not and should not include any major dry season irrigation projects.

The shortage of capital from both foreign exchange and domestic sources call for hand labor, hand tools and intermediate technology which do not require large capital investment and particulary, energy intensive inputs.

Energy from petroleum products will be increasingly expensive and an increasing drain on foreign exchange.

B. OBJECTIVES

The long-term objectives for the Agricultural Sector in Zambia are:

1. To increase agricultural production where exonomically feasible, so as to supply an adequate food supply with nutritional balance.
2. To increase employment and income opportunities so as to raise the level of living and help stem the urban draft.
3. To meet human needs with concern for self-reliance and participation of rural people.

The first objective does not mean self-sufficiency in food production for Zambia. Certain crops which do not have comparative or cost advantages in Zambia may be grown in limited quantities as special conditions may permit, but should not be pushed beyond this. It is far better to specialize in products which by natural and economic advantages, can be produced at greatest net return considering unsubsidized costs and border on world prices. These crops can provide for import substitution and exports. The exports can provide the foreign exchange for purchasing certain food imports for which Zambia does not have comparative advantage. But a food balance in exports and imports is not implied or necessary. The value of food, fiber and tobacco exports may be sufficient to pay for food imports plus other essential import items, or conversely, if not sufficient, exports of manufactured goods, minerals or invisable items may have to pay part of essential food import costs.

Production and/or import of adequate food supplies is not a sufficient objective, however. Nutritional needs must be considered for both human and livestock diets. Vitamin content and essential amino acids are of vital concern. Though not treated adequately in this report, fishery products are important for supplying protein needs.

Increasing employment and income will flow from increased agricultural production, but must also be supported by a commitment to redistribute income and opportunities from the urban to the rural area. Part of this commitment and redistribution involves meeting human needs, and these needs can only be discerned by inviting participation of rural people in helping to determine and meet their particular expressed needs.

C. AGRICULTURAL STRATEGY COMPONENTS

Strategies designed to reach the agricultural sector objectives within the framework of assumptions include the following components:

1. Price policy
2. Institutions
3. Area Development
4. Crop and Livestock Production
5. Human needs
6. Nutrition
7. Employment

This classification of strategic components is not to be viewed as creating independent categories which can be selected at random and implemented to reach the objective. They are interdependent and reinforcing and have to be considered in conjunction with each other, although with limited resource, priorities have to be assigned. A price policy may be non-functional without support of institutional development of trained technicians. Also, meeting agricultural objectives usually requires contributions from other sectors such as manufacturing. Attaining agricultural objectives will, on the other hand, enhance the attainment of other sector objectives such as an increased standard of living, greater employment and control of inflation.

1. Price Policy

The development of a price policy which spurs production of agricultural commodities has been an important feature of the GOZ's development strategies for the last three years and promises to continue to be so. In Zambia this has meant removing prices set artificially low for commodities such as maize, groundnuts and wheat, and adjusting new prices upward in favor of the producer.[14/] Since 1975, the GOZ has increased the price of groundnuts, wheat and soya beans by two-thirds' maize and sunflower seeds by one-third and cotton by fifteen percent.[15/] The price of maize, Zambia's basic staple, was increased by 22 percent in 1978 alone.[16/] Bad weather, followed by poor harvests, account for declines in productivity over the past two years (as do lack of farm machinery, seeds, fertilizer and transport brought on by Zambia's foreign exchange crisis and the current political situation) but indications are that Zambia's farmers remain receptive to price incentives as stimuli to greater production.

To date, efforts to increase productivity have been characterized by the establishment of uniform pricing throughout Zambia and set prices throughout the year for commodities. While overall output has been impressive, this

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14/See, Dodge, Doris, Agricultural Policy and Performance in Zambia.
15/Government of Zambia: The Current Economic Crisis..., p.9.
16/Ibid., p.6.

policy stance limits more creative and effective use of price policies. For example, uniform pricing tends to eliminate locational advantages and places a greater burden upon NAMBOARD's already strained transportation and storage capacity. The elimination of locational advantages reduces incentives to farmers in situationally advantageous areas to increase production while simultaneously building a subsidy to those farmers more remotely situated. At the same time, absence of price differentials discourages farmers in remote areas from bringing their produce to more accessible markets and/or distribution points, thereby compelling NAMBOARD to retrieve and store goods in these remote areas. The setting of uniform prices also limits the development of regional specialization insofar as comparative advantage is virtually eliminated. At the same time, elimination of regional specialization creates uniform transportation and storage demands, creating bottlenecks in the efficient movement, storage, and processing of commodities. By establishing seasonally uniform prices, the GOZ is discouraging farmers from storing their produce, thereby compelling the NAMBOARD to develop more effective storage and transportation capacity.

Above and beyond the limitations of uniform pricing policies, one must confront the issues of productivity and socio-political limitations. While the limits of expansion of productivity have not been reached, they are not infinite. The room for expansion in the emerging sector arising as a response to price incentives has been impressive, but improved productivity on three to five hectare holdings is going to require greater development of the capacity to deliver agricultural services by the MLA. The GOZ cites maize production differentials between emerging and commercial farmers as five to one as evidence of the potential of the former. But this figure overlooks the considerable advantages gained by greater technical and labor inputs on large holdings that are presently beyond the reach of the Zambian small holder. Pricing policy while in theory capable of spurring the small holder to increase the size and quality of his/her inputs is, nevertheless, not operating in a vacuum or in a state bent upon encouraging the development of an autonomous rural capitalist agricultural sector. Thus, the GOZ, to the extent it remains commited to its philosophy of humanism, will have to determine the degree to which it can utilize pricing policies consistent with a socialist orientation. Related to this is the past practice of adjusting prices in such a way as to ease the financial burden of the urban consumer. While subsidizing both the producer and consumer is a policy the government is commited to end, the political acuity of the consumer when confronted with sharply rising food prices, is an issue the government cannot afford to ignore.

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These criteria all point to the likelihood that price policies, while certain to be a continuing element in Zambia's agricultural strategy, require extensive and on-going examination by Zambia's agricultural planners. United States assistance in this planning effort is clearly available, but the political sensitivities connected with involvement in this endeavor suggest caution in such an undertaking.

2. Institutions

The issue of what priorities to establish in the development of new states has included a fairly intense debate over the primacy of developing administrative institutions or participatory mechanisms. An early advocate of participation, Fred Riggs[17] argued that unless participatory mechanisms are established early in the development of a political system, institutional counterparts will overwhelm them and result in the development of a bureaucratic-authoritarian state with a passive citizenry. Samuel Huntington,[18] arguing for institutional development, stated that prior attention to participatory mechanisms places too many and such great demands upon the system that the fragile administrative structure proves unequal to the task of processing them and political disorder results. Recent research examining the efficacy of various development project[19] states that those in which participatory mechanisms are built into the development process are far more likely to be successful than those without them. But success also hinges upon the development of responsive and capable institutions and cadres suggesting that some simultaneous institutional and participatory development is necessary.

The GOZ, in articulating an agricultural development policy is well aware of the need to improve its institutional capacity. It has not, however, advanced similar concerns over the issue of popular participation, save its desire to utilize Rural Reconstruction Centers as foci for rural development.

Assuming that the TNDP will articulate an agricultural strategy that largely maintains the present system intact, greater emphasis will be placed upon development of the institutional dimension. Strengthening of the MLA's institutional capabilities remain important and means by which this can be accomplished are discussed elsewhere in this study, most notably, in Appendices C and D.

17/Fred Riggs, "Bureaucrats and Political Development: A Paradoxical View," in J. LaPalombara, ed., Bureaucracy and Political Development Princeton: Princeton University Press, 1963.

18/Samuel Huntington, "Political Development and Political Decay," World Politics, LXII, no. 3 (1965).

19/See DAI, Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects, Washington, D. C., 1975.

However, a modification of the present system, one that includes the interfacing of participatory mechanisms and institutional structures will require the creation of a very different kind of planning and execution process. This would entail developing a central planning unit consisting of representatives from planning, extension, relevant parastatals, cooperatives, research, forestry, livestock, fisheries, UNIP and from the Ministry of Education. This unit would ensure that as comprehensive and coordinated an effort as possible would be undertaken in agricultural planning and execution. Similar planning units would be established at the Provincial levels. These latter units would have the responsibilities of tailoring Zambia's agricultural objectives to include representatives from community development and social welfare agencies. In addition to transmission of national planning objectives, provincial units would prepare agricultural development plans for their own areas prior to the development of the national plan itself. Equally important, such units would have the responsibility for seeing to the execution of the plan. This would entail strengthening the absorptive capabilities of ongoing institutional efforts and overseeing the actualization of new programs (such as the CRDA scheme suggested at the conclusion of the strategy section). Active UNIP involvement at each level would ensure the presence of participatory mechanisms and would reinforce constant awareness on the part of development administrators of the political and social realities extant in the areas of their concern.

3. Area Development

Given Zambia's land mass and dispersed population, an agricultural strategy that seeks to consolidate services andmake them consonant with community development and social welfare objectives makes a great deal of sense. In fact, the area development concept has been present in Zambia since the end of World War II. Then, the British government sought to bring about area development by means of a parish system. Each parish was to include "a central market town containing the local African administration for the parish, the churches, the school, community centers, market, recreation hall, library....traders, artisans and persons engaged in rural industries."[20/] The parish system foundered. Heavily dependent upon development inputs, manpower, valid data, capital and capital equipment, the parish system came into being at a time when all these requisites were in short supply. Not only were these inputs lacking, but many Provincial administrative officers opposed it, further undermining its success.[21/]

20/G. Kay, Social Aspects of Village Regrouping in Zambia, University of Zambia, Institute for Social Research, 1967, p. 16.

21/Ibid, p. 17.

More recently, the SNDP returned to the concept of area development, this time seeking--more modestly--to establish four Intensive Development Zones (IDZs). The objective behind the IDZ idea were sixfold:

a) decrease the disparity in social services between urban and rural areas;

b) create self-sustaining improvement of incomes and productivity in the rural areas;

c) moderate the rural to urban rate of migration;

d) contribute materially to national self-sufficiency in agricultural commodities;

e) mobilize resources for diversification of production and localization of economic activity; and

f) provide a sound programme base for future development of rural areas.[22/]

IDZ sites were essentially chosen on the basis of "areas with the greatest inherent potential within Provinces."[23/] Ultimately, three IDZs were launched: one in the Eastern, one in the Northern and one in the North-western Province. Despite some success,[24/] the GOZ appears to have decided to shelve this approach. Blame for its lack of success is generally attributed to the lack of governmental commitment to it in the first place. Certainly it was the case that poor coordination between ministries and within the MLA between the center and the periphery undermined the ability of the IDZs to actualize their objectives. Furthermore, the quality and quantity of IDZ administrative personnel was unequal to the tasks assigned it. Finally, there was little if any opportunity for participants in the IDZs to have any input into planning and execution of various projects.

Presently, the World Bank is arguing for a Zambian agricultural strategy based upon area development, but one that will incorporate approximately one-third of all rural Zambians within seventy to eighty Rural Growth Areas (RGAs). Each RGA would service 4,000 farm families and encompass a geographic area of some 30km. At the center of each RGA would be a Rural Growth Center (RGC). The RGC would provide essential services for the RGA developing infrastructure and communication links throughout. In addition, the RGC would serve as the locus for community development and social welfare inputs.

22/Second National Development Plan, p.177.

23/Ibid.,

24/IDZ Central Unit, Evaluation of Intensive Development Zones Programme of the Republic of Zambia, May, 1978, pp. 98-134.

Marketing, credit, banking, postal, storage, health, education, culture, and administrative offices would locate there.[25/] Seeking to avoid the problems of the previous area development programs, the Bank is calling for a well coordinated effort with primary planning and execution responsibilities resting at the Provincial level in the hands of an interministerial board.[26/] Participation of the small holders is to be sought through self-help schemes to further infrastructural development, and lessen dependence upon the central government.[27/]

While the Bank's project is compelling, it suffers, we believe, from at least three important flaws. First, the alteration of any administrative function is a complicated process to achieve. It has been argued herein (and elsewhere) that the quality of Zambia's agricultural staff performance is seriously problematic. By taking the present staff and remolding it in a new administrative unit with new functions, one doesn't necessarily come up with a vital and effective unit. Preparation of a field staff for such a program would require immediate, massive, and intensive training. Such efforts on such a scale are presently beyond the capacity of the MLA and other ministries to achieve.

Secondly, the proposal specifically calls for the reduction of services to those families outside the RGA's. However gradual this process, the plan is talking about services to more than two-thirds of the farming families in the rural areas. Concentration of services would likely require a fairly rapid reduction of services outside the RGAs in order to staff the new units. This fairly sizable reduction of rural services when tied to significant reductions in the urban areas may create a politically untenable situation.

Third, the proposal is quite vague concerning the nature and extent of participation of smallholders. Aside from calling upon smallholders to engage in self-help schemes and leaving the provision of services in small villages outside the RGAs to UNIP cadres, very little is said as to what kinds of participatory mechanisms will be utilized. Earlier, herein, it was argued that popular participation in planning and execution was an important aspect of successful rural development. The Bank clearly recognizes the importance of this kind of participation as can be seen in several of its projects elsewhere and even in its urban site and services project in Lusaka.

25/ World Bank, Republic of Zambia: Agricultural and Rural Sector Survey, October 20, 1975, Annex 2; Appendix II, p.22

26/ Ibid., p.10.

27/ World Bank, Annex 2, Appendix II, p.8

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There are other questions raised by such an undertaking such as the extent to which Lusaka would truly be willing to disengage itself from active involvement in a program of this magnitude. But these problems boil down to the dilemma of dealing with change in a ministry that, along with relevant parastatals and other ministries, finds itself "a mile wide and an inch deep" in terms of the service it seeks to deliver and the personnel it uses to do so. The basic concept of the RDA is a good one but the introduction of so many and so rapidly is, we aver, too risky.

Instead, an area development component should concentrate on creating the mechanisms through which a more comprehensive agricultural strategy can be undertaken. The basic elements of such a strategy appear at the end of this section.

4. Crop and Livestock Production Strategy

Crop and livestock production is largely encouraged (or discouraged) by price policy, institutions, infrastructure and other supportive structures, and is more of a goal than a strategy in the formulation of this paper. However, production in itself does provide and support import substitution, exports, improved levels of living, inflation control, employment and other segments of policy and strategy for improving Zambia's overall economy.

a. Maize. Maize production is of paramount importance as the basic food of Zambia, and the government has recognized this. Production has increased due to improved price, hybrid seed, and Extension package of inputs adopted by the farmer. In spite of an encouraging picture, however, maize is very subject to the uncertainty of rainfall, and the presently used hybrid SR 52 appears to be becoming more susceptable to fusarium rot. Additional long-term storage facilities strategically located both near production areas and near border exits could serve as a reserve for Zambia and help fulfill needs as they occur over all of southern Africa. This storage would also reduce transports needs for moving the crop to the line of rail.

The United States should have as much expertise and diverse a variety bank as any country in the world to support ongoing hybrid research in Zambia, which should include not only disease resistance, but yield and protein content.

Therefore, two elements for augmenting the maize success would be:

1. Increase the number of, and disperse permanent maize storage facilities, and
2. Support research into high yielding, protein enhanced and disease resistant hybrid seed.

b. Oilseeds. The import substitution need of oilseeds for oil and stockfeed has been stressed. UNDP has carried on a National Oilseeds Development Program for the past four years, and has concentrated largely on the more traditional sunflower by supporting research at Mount Makulu and in other ways. The recent surge in sunflower production (except 1977) shows the results. UNDP now wishes to increase its efforts in soya bean for its potential as a commercial crop and for its value as a balanced amino acid protein. They have not as yet been successful in obtaining support or professional help.

To attain self-sufficiency by 1980 in oil and cake productions, UNDP estimates the following quantities of oilseeds are needed:

	Quantity (Tons)	Percentage increase over 1977	Oil Yield (Tons)
Sunflower	40,000	200	14,000
Groundnuts	20,000	260	8,500
Soya Beans	30,000	2355	5,000*
Cottonseed	10,000	12	2,000
Total	100,000		30,000

*Allowing 10 percent of the oil to remain in the cake by use of the expellor process.

This amount of production would yield 50-60,000 tons of oil cake, or about self-sufficiency.**

The second column of the table shows the percentage increase from the 1977 crop needed to meet the goal; a tripling of sunflower production, more than tripling groundnut production and over a 2300 percent increase in soya bean production. Only the cottonseed goal appears attainable; it is unlikely the others will be met by 1980 and the soya bean goal emphasizes the tremendous effort needed here.

Of these crops, groundnuts, sunflower and cotton are traditionally grown on small Zambian farms, therefore, little is known about cost of production. The recent price increases stimulated production, except for faltering of sunflower in 1977 and 1978, though this may have been weather difficulty. The prices therefore, appear to cover costs and provide production incentive. In the case of soya beans, due to required cultural practices, they will be grown mainly on commercial farms. For this relatively new crop, study is needed on

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** This would be only the protein concentrate in the stockfeed. Other ingredients presently used, mainly maize by-products (85,000 tons), wheat by-products (30,000 tons) and imported fish meal make up the estimated requirement of about 105,000 tons.

the cost of production, variety, adaptation and disease control. Elements to support this research would be:

1. An agricultural economist to study production costs, and prices needed to cover these as compared to border and world prices.
2. A plant breeder and agronomist to study varieties and disease control.

c. Wheat. Results of research being conducted principally by Canada, should be evaluated carefully for risk and cost factors in producing either irrigated or rain fed wheat. These costs should be compared to world prices and to the cost of Zambian grains already produced, considering not only yields but calorie and nutritive content as well.

d. Beef Cattle. Beef cattle are an important and potentially productive sector. Zambia already has schemes under way which appear promising--projects which it is hoped by Animal Husbandry officers will begin showing results in ten years or so. There does not seem to be a particular place where USAID support can be concentrated effectively. Monitoring of development schemes over time might indicate areas for AID impact.

e. Dairy Cattle. Other donors (European and Canadian) are helping and suggesting help in artificial insemination and animal import to upgrade and increase dairy cow number. There does not seem to be a point for USAID input. Other production efforts may be more productive and less costly in providing increased foreign exchange for continued purchase of imported dairy products.

One commercial dairy operation was supplying most of its protein supplement from use of broiler litter. The litter of 7,000 broilers slaughtered per week has hauled directly to be mixed and fed about 150 milking cows. This litter was mixed half and half with maize bran for a complete ration for most of the dairy cows and sheep. The biggest dairy producers (cows were divided into three groups by production) were receiving additional sunflower cake and molasses was fed occasionally. The milk yields were good and the cows (during the dry season) were in very good condition. The manager said his production was maintained or even increased in the dry season as compared to the grazing period.

Dr. Cross (livestock specialist from Clemson, South Carolina) was not able to observe this operation on his visit in Zambia. His knowledge on the nutritive value and disease precautions in use of poultry litter could be valuable for other dairy farmers and particularly for state and parastatal dairy farms which were having serious protein supplement problems and could obtain litter from state poultry farms.

Relative to all livestock production, more professional veterinarians are a desperate need. Only twenty-two, supposedly, are in Zambia at present. A veterinary school is proposed for the new college at Solwezi, but it will be years to decades before veterinarians will be graduating. A pre-veterinarian program is presently functioning at UNZA, but it appears it could be strengthened. A joint pre-vet program with NRDC could provide the farm and livestock facilities of the latter for demonstration and laboratory work. For some years to come, students will have to continue going to veterinarian schools outside of the country, such as they are doing in Kenya. Zimbabwe could provide a very favorable opportunity for vet training. USAID might support students in this out-of-country training.

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5. Human Needs Strategy

Historically, virtually all strategies dealing with agricultural development have paid lip service to the idea that human betterment was an underlying consideration to what was being proposed. At the turn of the 1960's, a growing awareness of the importance of aspirations (probably initiated by the literature of so-called "Third Force" psychologists such as Abraham Maslow[1] and Eric Fromm[2]) began pushing the primacy of human needs fulfillment to the forefront of the development debate. Analysts such as William McCord[3] and Dennis Goulet[4] argued that fulfillment of human needs were a necessary requisite to successful development and that such needs would best be met by developing participatory mechanisms by which rural dwellers -- most often very poor -- would have a significant input in determining the nature and pace of such development. This position was tangentially reinforced by agronomist/environmentalists such as E.F. Schumacher.[5] At present, post Western aid donors stipulate in some fashion that the relationship between specific requests for assistance and the participation of or anticipated benefits for the rural poor must must be made explicit. Betterment of the rural poor is thus a primary consideration.

Zambia, at the crossroads of altering its emphasis upon reliance upon mineral wealth to concentrate more upon agricultural development is certainly in a good position to consider a donor strategy that emphasizes human needs. Rural-urban incomes and social service disparities are well documented. The need to stay the flow of rural to urban migration is clearly recognized by the GOZ. The philosophy of UNIP places considerable emphasis upon developing participatory mechanisms in the countryside and a growing awareness of the desirability of decentralizing authority to meet the diverse needs of Zambia's rural dwellers has been articulated by at least one major donor.[6]

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[1]Maslow, Abraham, New Knowledge in Human Needs, 1970.

[2]Fromm, Erick, The Revolution of Hope, 1963.

[3]McCord, William, The Springtime of Freedom, 1969.

[4]Goulet, Dennis, The Cruel Choice, 1969.

[5]Schumacher, E.F., Small is Beautiful, 1972.

[6]See various World Bank Studies and AID proposals.

What would an agricultural sector strategy that emphasized human needs look like? This would, in large measure depend upon whether the GOZ were instrumental in developing a human needs inventory or whether such inventories were the outgrowth of popular regional assemblies. In either case, the following expressed needs would be among those that emerged:

1. Improvement of social services (schools, clinics, cultural facilities)
2. Improvement of social overhead capital (roads, boreholes, electricity, market and storage facilities)
3. Improvements in goods and services delivery to farmers (more manageable extension worker to farm family ratios, improved credit facilities, better veterinary services, home economics services, adaptive technology and research capacities)
4. Generation of more equitable income levels
5. Improvement in the quality of life (better housing, availability of a variety of goods for purchase)

Such expressed needs are neither exhaustive nor prioritized, but a strategy aimed at meeting such needs among the rural poor departs dramatically from existing alternatives in several important ways. First, and perhaps foremost, emphasis is placed upon those areas of the country where the least amount and perhaps the least potential for development has occured. Second, there is little commitment to concentrating upon a commodity or commodities package. While eventual increases in agricultural production are assumed, they are not the focus of such a strategy. Third, this is a long term (vs. "quick fix") orientation. Although change will be readily apparent, realization of those objectives established by UNIP, the MLA and rural dwellers may take a decade or more to realize. Fourth, popular participation extends far beyond enumeration of human needs. The formidable costs of such an orientation could be defrayed in part only by massive self-help schemes in actualizing it. Fifth, more than merely increasing the number and quality of administrative and field personnel, such an orientation calls upon the GOZ to completely revamp its existing agricultural and rural development-related staff. The newly formed organization would consist of a number of discrete virtually self contained units capable of coordinating presently autonomous extension, veterinary, parastatal, health, education, research, and rural development personnel efforts and executing policies formed in conjunction with farmer/party organizations. Such

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units would operate in administrative areas of 2,000 farm families (this figure arrived at from experience with similar projects in Malawi, Ethiopia, and Senegal), and would be backstopped by a regionally specific central services unit in the areas of planning, adaptive research, appropriate technologies, and project execution.

While effective development of such a strategy would probably require eventual resettlement (particularly in the sparsely inhabited northwest and parts of the Northern, Southern, and Western Provinces), its initiation would most profitably be undertaken by self selection upon a trial basis. Among other things, attachments to areas have proved to be important human needs.

As in the case with all extensive development strategies, one based upon human needs would begin with a detailed mapping and resource inventory. Popular assemblies organized by party cadres would bring the results of such efforts to the attention of rural dwellers, and, depending upon the direction chosen, plans would be developed regarding appropriate infrastructure and personnel mix needs. Simultaneously, farmer/party/development cadre organizations would be established to insure the continuity of popular participation, and coordination of activities within specific regions.

With respect to specific projects, schools, clinics and cultural facilities could be developed through self help with minimal government investment. Encouragement of multiple use of structures to maximize use and minimize costs would be encouraged (e.g., FTC's could be utilized as staff headquarters, adult education, and cultural centers). Improved housing and farm storage are also areas where self help and local artisanry development would defray costs.

The inputs regarding social overhead capital might be more long term and costly but training of locals in road maintenance, well maintenance, and other service roles (electricians, mechanics) would both ease the burden of government personnel commitments and increase opportunities for off farm employment. Further, popular involvement in services such as credit unions where peers would determine credit-worthiness and socially enforce collection of outstanding debts would aid in the development of sound rural economic practices and in some cases actually build upon traditional lending practices.

a. Constraints

Two major constraints exist which may prove fatal to such an orientation. First, as mentioned above, a strategy based upon human needs, while not disregarding economic feasibility, nevertheless does concentrate upon the poor in areas that may well be economically marginal. Given the amount of arable land

capable of development in ways that would greatly assist the GOZ in altering its bleak export earnings position, investment in areas with high productivity potential would appear to be a more attractive alternative. Even though increased productivity is an assumed result of a human needs strategy, such improvements may be a long time in coming and, in any case, no such strategy has ever lived up to its projected rates of return.[7] Thus, however laudable and compatible with the GOZ's commitment to humanism, a strategy based upon human needs -- at least at present -- may have to wait for better times.

The second important constraint affecting actualization of a human needs strategy has to do with manpower. The input of government based manpower necessary to realize this strategy is not, in terms of numbers, a significant problem. GOZ projections regarding future manpower needs would likely meet the requirements of such a strategy. More problematic is the degree to which extant training and operations would have to be revamped in order to achieve it. Lack of coordination between ministries; quality of personnel problems within the extension service and parastatals; predispositions toward centralized control; technical narrowness in training; demoralization of personnel within the central administration of the MLA, and, low perceived status of agriculture within Zambia all have made their impact upon the direction of agricultural development within the country. Elimination of these constraints will prove to be a monumental task to say the least. Remolding the extant infrastructure and personnel to the task of realizing a human needs strategy may therefore [illegible] At least in the short term. Attention to human needs [illegible] however. Many of the mechanisms cited above [illegible] an area development strategy that accounts for economic viability [illegible] The key role in such a strategy would best be [illegible] appropriate technology capabilities [illegible]

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[7] See [illegible] Development, 1978.

6. Nutrition Strategy

Robert Stauffer[1] in a seminal article in 1969, stressed the relationship between nutrition and underdevelopment. Serious endemic illnesses, calorie and protein deficiencies due to hunger or a poorly planned diet might, he averred, lead to the creation of a people within a state not driven (in the revolutionary sense) to political violence, but rather permanently apathetic, incapable of participating fully in the development process whatever the efforts of the government. The recent controversy over the effects of chronic malnourishment in the Sahel and other areas of Africa served to highlight the importance of developing sound nutritional bases for agricultural strategies. While no state plans malnutrition, policy choices that emphasize the production of specific agricultural commodities (often export crops) may indirectly result in creating just such a situation.

A recent FAO study[2] disclosed that potentially serious nutrition-related characteristics were present among the Zambian people. A shortage of calories, some protein deficiencies, blood diseases related to the presence of parasites, and goiter were among the problems uncovered, as were seasonal variation in food intake amounts and the lack of cash to purchase otherwise unavailable foods in order to healthfully vary ones' diet.[3] This latter situation particularly affects subsistence farmers who actually consume less than urban dwellers despite the fact that they grow their own food. Nutritional balance is also affected by what can be grown in Zambia and what must be imported. Although self sufficient in maize, sugar, eggs, poultry and pork, the costs of food imports (some essential) have amounted to virtually equal the amount the GOZ has allocated for agricultural development. At the present time, the GOZ is aware of these shortcomings and has stated that one of its major objectives in assisting small farmers is "improving nutritional standards and consumption of protein-rich foods by means of increased production."[4]

In light of these realities, a U.S. strategy based upon improving the nutritional quality of Zambia's food supply would ostensibly be well placed.

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[1] Stauffer, R.B., "The Political Dimension of Underdevelopment," Comparative Political Studies, 1969.
[2] FAO, Zambia, Results of the Nutrition Survey (Rome: 1974).
[3] Ibid, pp. iii.
[4] Knutsson, Gunnar, Report to the MLA on Expert Assistance to Agricultural Training in Zambia, SIDA, 1977, pp. 53.

The components of such a strategy would require developing a comprehensive aid package that would include:

a. Improvement of health education curricula in primary and secondary schools; increasing the number of health education courses in rural centers (FTC's and FI's) taught by rural home economists. Presently, the WHO provides health education specialists based in Lusaka, but there is room for expansion here.

b. Development of rural stockpiling capabilities for food away from the line of rail is essential in assuring rural dwellers year round availability and protection against drought. Such capability in maize is especially important. Associated with this effort would be development of ancillary chicken and pig farms. Currently the FAO, the FRG, and the U.K. are pursuing such efforts.

c. Intensification of riculture efforts to lessen dependence upon maize and grain diets. Other staples are more questionable. GOZ efforts to develop potential in wheat have been discouraging while millet and cassava have only regional appeal. At present, [illegible] providing assistance to Zambia and this in the form of a [illegible] upon earlier donor efforts [illegible] and Lusaka Provinces. With production of rice in [illegible] expected to be somewhere in the area of 2,500 tons and [illegible] estimated at about 8,000 tons, this area calls for greater effort.

d. Further development of Zambia's fishing industry. Fish make up more than [illegible] of all animal protein consumed, and proper drying and [illegible] facilities could greatly improve the protein intake in the rural areas. Improvements in this sub-sector are currently [illegible] a number of donors (most notably FAO, [illegible], and the U.K.) and further assistance [illegible].

e. Verification [illegible] to supply of essential fruits and vegetables [illegible] small scale farm plots for the urban poor to enable them to supplement food purchases. The FAO

and CFTC are peripherally involved in this area but there is greater need for planning, coordination, and development.

f. Dairy products are nutritionally necessary and there continues to be a high and growing demand for them, but at present (and, most likely in the future) Zambia's capability to develop a full fledged dairy industry will be wanting. This area is not seen as promising, and might best remain open to imports -- say, from Mozambique.

g. Oilseeds production provide both improvements in the fat content in Zambian diets and feedcake byproducts for cattle. This is presently an area where growing imports are both unnecessary and avoidable. In addition to groundnuts, sunflower, cottonseed, and, perhaps, soya processing offer suitable alternatives. The FAO is currently the only donor actively pursuing an oilseeds project, but given the fact that 70 percent of Zambia's oil needs and 90 percent of stockfeed ingredients continue to be imported, there is substantial room for improvement.

h. Improvement in animal nutrition is an important ingredient of a nutritional strategy insofar as healthy animals are more productive and safer to consume. Zambia's animal offtake for consumption continues to be low (and of low quality), but improvement in cattle production (especially beef) is felt to be quite likely, and at present the FAO, CFTC, CSSR, Denmark, FRG, Finland, Japan, the Netherlands, and the U.K. sponsor one or more projects with this end in mind. Additional assistance in this sub-sector would be incapable of absorption.

What emerges from an examination of the components of an agricultural strategy based upon nutrition, is that with certain important exceptions (and these of a project nature), U.S. efforts would overlap with those of donors presently involved, and that while better coordination of these various efforts is warranted, this approach per se is "taken." What is lacking in many of the abovestated projects, however, is a manpower component. The FAO anticipates undertaking a comprehensive manpower study of the agriculture sector early in 1979. Based upon its findings, a U.S. strategy to provide training for nutrition-related staff would be well received.

7. Employment Strategy

The efficient use of scarce resources requires the optimum mix of land, labor and capital inputs. In this employment strategy, the emphasis is upon improving the returns to the labor input.

An employment strategy is basically on the demand side of the human resource development equation. While training is indeed a prerequisite to development, programs to effectively exploit the trained manpower are also needed. Specifically, education and training are the means to an end -- the end being having the person productively employed.

The area orientation strategy discussed above outlines a procedure for focusing on the development of rural growth centers and associated smaller villages as collection and distribution points for agricultural output and inputs. In addition to these basic functions, these centers could also serve to provide the local point for providing services and first level manufacturing activities.

The current tendency for rural to urban migration of the rural residents might be redirected toward these rural centers if employment and income possibilities are provided closer to home. The most feasible employment opportunities are probable in the area of first level processing of agricultural commodities and small scale production of consumer goods. The rationale for this approach is that it provides a basis for development of import substitution and a direct attack on under and unemployment in the rural areas.

The specific types of activities to be located in these centers would require additional investigation in which major emphasis would be on such factors as economies and diseconomies of size, matching of skills to jobs requirements, market potential, energy, transport, and the like. The GOZ is aware of the magnitude of these needs but remains committed to the development of agriculturally related industries in rural areas and has established a parastatal ROCIC to pursue development of them.

The following are examples of the types of activities visualized, but any specific program would need to be preceded by a more detailed economic analysis. A final caveat is that although it would be possible to pursue any one or mix of the following without engaging their development as part of a regional growth strategy, their being part of a regional growth compliment would improve their chances for success.

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a. Processing of Oilseed Crops. - Currently Zambia imports about 70 percent of its oil needs. There is the promise of substantial increases in production of oilseeds through use of hybrid varieties. The development of first level processing (extraction, etc.) would provide a basic manufacturing activity which would utilize currently underemployed labor as well as provide a major input to the nation's livestock sector (nearly 90 percent of stockfeed is currently imported). It is hoped that at least a portion of the foreign exchange savings through this process would be available for additional investments in the agriculture sector.

b. Cotton Milling Facilities. - Unlike oilseeds, cotton milling is well under way at Kabwe and at the Kafue mills. This latter and larger unit is being pushed to its limits, however, insofar as its 10-11,000 ton capacity will be unequal to the projected 12,000 ton milling needs of the 1978 season. The GOZ anticipates improvements in Kafue's milling capacity by enlarging the plant to accommodate another 4,000 tons, but Zambia's cotton potential through the Third National Development Plan period is to reach 40,000 tons. This will call for locating new mills elsewhere. Improved transportation capability might make it possible to locate these units off the line of rail. Failing this, it would be in Zambia's interest to investigate development of cottage industry spinning for local consumption and export.

c. Bakeries. - The SNDP called for the establishment of some twenty bakeries in the rural areas. The team was unable to determine the success of this goal but bakeries are an excellent means of both improving nutrition and employment opportunities. Rural location also has the advantage of enabling individual units to cater to distinct tastes and take advantage of the availability of locally grown crops. Where nutrition is a problem, the possibility of vitamin charging may be possible.

In addition to these industries, various regionally specific rural small scale industrial efforts could easily sustain efforts in the areas of farm tools and impliments manufacturing (these need be little more than developed blacksmithies), food processing (fish, fruit, canning), oxcart assemblage, culvert molding, brick factories, tanneries, stockfeed mixing and grain milling. As previously stated, the appropriate mix would depend upon regional circumstances, but the ability to absorb the population growth in rural areas and halt the urbanward migration would be significantly affected by the expansion of opportunities for rural artisans.

Currently, UNDP/UNIDO, CFTC, and India are involved in small scale industrial projects but none of these schemes are rural specific. The issue at hand regarding U.S. involvement in a small scale rural employment strategy would therefore not be one of appropriateness or benefits. Rather, it hinges upon the willingness of the U.S. government to sponsor a long term strategy that will most likely sustain the GOZ's determination to pursue socialist units of production. RUCOM and/or INDECO would be the parastatals through which such a development strategy would have to take place. As such, an additional component of this strategy would have to include a significant manpower development project for the relevant parastatals. It is our opinion that this strategy, as part of a rural growth area strategy, merits serious consideration.

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V. ZAMBIA'S AGRICULTURAL STRATEGY

A number of components/strategies have been articulated in this examination of Zambia's agricultural sector. At present, indications are that the TNDP will emphasize a strategy that encompasses aspects of three of those stated above:

1. pricing policies with institutional development
2. increased crop production
3. area growth and production

Each of these, when expanded upon in the TNDP will subsume aspects of the other components mentioned herein. Thus, pricing policies will affect crop production, assume the development of improved agricultural infrastructure, indirectly but importantly improve the human needs and nutrition of Zambia's farmers, and increase employment through processing of outputs while retarding urban drift. Similarly, the interfacing of increased production with overall development of agriculture, agro-industries, feeder roads, marketing services and related social services in rural areas, is patent. The GOZ's perception of an area growth strategy is equally comprehensive, but at variance with that of the World Bank. Building upon the extant infrastructure and utilizing Rural Reconstruction Centers and state farms as nodal points for development, the GOZ perceives area development continuing along much the same lines as in the past, but with much improved delivery of inputs such as credit, farm implements, extension, etc. There is government interest in improving local participation and regional development, then, but few indications that self-contained rural growth centers are the way to go.

This three pronged strategy as a whole, thus, appears to be a refinement and articulation of policies that have been emerging in Zambia over the last five or so years and as such does not radically depart from the past. The question is whether it is adequate to the future tasks demanded of it by the GOZ. The answer to this question will largely hinge on four criteria:

1. the determination of the GOZ to make good on its expressed intentions to upgrade the importance of agriculture;
2. substantial inputs of foreign assistance;
3. extensive development of professional and technical staffs within the MLA, parastatals, and importantly, in the field;
4. the overall soundness of the strategy.

Public statements and commitments to donors indicate that the government has every intention of moving in the direction of upgrading the status and importance of agriculture to the point of making it Zambia's number one priority. Furthermore, Zambia has sought and largely obtained assurances of assistance in the areas of technical assistance and capital requirements for its crop production, livestock, and personnel projects. The area of expertise: managerial, economic, extension, education, and the like may prove more problematic. Although the GOZ projects increase in the numbers of staff and is receiving some assistance in achieving it, it is the team's contention that these are unsufficient to meet present needs, let alone expand on the level described by the government as desirable. The newly proposed projects alone require greater personnel inputs than the total number of new staff positions projected, thereby leaving the extant staff in as precarious a position as ever.

Further use of pricing policies and emphasis upon specific commodities to improve productivity are both sound and essential aspects of an agricultural strategy. Institutional and area development as conceived by the GOZ, however, raise serious questions as to the soundness of such an approach. These questions once again focus on the issue of manpower. In brief, this manpower constraint is seen as the potential Achilles' heel of Zambia's proposed strategy, for in its efforts to do as much in as many places as possible, the GOZ has spread its efforts too thinly. As seen in Appendix C, for example, there are presently more [illegible] and FI's than there are staff to man them. As a result, many remain closed or under-utilized. And yet, the GOZ with World Bank assistance, is constructing 19 more. This example is illustrative of the extent of the problem of capacity. There are many more such examples, and it will take considerable time and effort to right them. In light of this situation, the area development strategy of the GOZ for the IMF, while laudable, is nevertheless making this personnel problem's solution more rather than less difficult. What is needed is greater rationalization of present resources. This can best be achieved by concentrating them within manageable units. Rural Growth Centers as perceived by the World Bank are one such way of doing this, but the Bank's position of supporting the simultaneous creation of 70 or more such centers throughout Zambia would--at least in terms of services and manpower requirements--prove as overwhelming to Zambia's capacity ability as the government's own alternative.

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The GOZ can, however, opt for another orientation, one that maintain's Zambia's basic objectives regarding the utilizing of pricing and production increases and that also achieves improvements in the lives of its rural smallholders and their families. This option would call upon the GOZ to maintain and improve as necessary its services and inputs to rural smallholders without embarking upon expansion of costly new inputs. As the same time, the MLA should seek to establish on a trial basis, eight comprehensive rural development areas (crdas) where a unified and far reaching program of inputs and services will be provided.

Simultaneously, large scale units will be encouraged through pricing policies, tax, and foreign exchange allowances, to produce those crops where economies of scale and technological inputs place large units at an advantage, but one that is not harmful to smallholders. Double cropping soya and wheat, sugar, and perhaps tea and coffee would be four such crops. These crops might, like sugar, be produced upon state farms, but the economies of their development suggest that government encouragement of Zambia's some 800 private large unit holders to produce them would prove more efficient.

A. COMPREHENSIVE RURAL DEVELOPMENT AREAS

The establishment of eight such areas (one in each region) would provide the MLA with an opportunity to test long range comprehensive development alternatives at a level that is both significant and cost effective. Units would consist of 5,000 farm families in areas of approximately 40,000 acres. Boundaries would reflect geographic and environmental contiguity and similar production characteristics. Utilizing Rural Reconstruction Centers, as suggested by the GOZ, to act as focal points, the crdas would first be mapped and a resource inventory developed. Next, a plan for the development of staff and for the improvement of infrastructure in the form of feeder roads, storage facilities, dams, bridges, boreholes, culverts, marker ridges, and the like, would be developed. Such a plan would be created by a joint committee consisting of crda professional and technical staff, appropriate parastatal personnel, UNIP cadres and smallholder representatives, to be assisted by expertise provided by the central MLA. Infrastructural development should, wherever possible, emphasize self help.

Essential to the success of the crda scheme is the establishment of a well coordinated team of professional and technical personnel that work well with one another as much as with the farmers. Accordingly, clear lines of authority must be established such that each member of the staff recognizes that he/she is part of a team. Genuine responsibility and ability to deliver must exist so that the crda team must function as an autonomous body which includes parastatal, health, educational, research, extension, credit, and regional administrative personnel.

In light of this prerequisite, it may be necessary to create a central coordinating body with its own funding to which such teams report, perhaps in the office of the president. It is anticipated that the development of such a staff and the ironing out of procedures on the ground will take approximately two years. Government personnel per typical crda might include:

1 professional officer	1 research unit
20 technical staff (extension)	1-2 RUCOM/INDECO personnel
6 credit personnel	2 health units
2 home economics instructors	10 NAMBOARD personnel
2 clerical officers	3 education units

Procedures to maximize participation of smallholders and party cadres in the ongoing affairs of the crda would be established such that bi-monthly review meetings with staff, with established agendae, would be utilized.

As time proceeded, modification of staff needs and goals would occur. It is essential in such a scheme to establish an effective training procedure for farmers and staff alike. Accordingly, the FTCs and FIs within the crda would be turned to this end (a function they were in fact created for). Ongoing and follow-up training would be regular features of this effort. Assuming success, these training units would also be utilized in the future to provide training for the next generation of crda staff.

Coordination of the entire crda effort would include yearly meetings between representative committees of each of the crdas to compare notes and facilitate the flow of information.

The anticipated time frame, for such an experimental crda effort, is 15 years. Initial efforts should begin to produce results within five, and a second generation of crdas could be launched after seven years. The initial effort would impact upon eight percent of Zambia's rural smallholder.

B. THE ROLE OF THE UNITED STATES

The GOZ is about to embark upon an ambitious agricultural development program. Whatever the ultimate direction, its personnel requirements in the coming years will be great and its potential for realizing its aims heavily dependent upon the quantity and quality of such personnel. Were the government to adopt some form of the strategy described above, the appropriate role for USAID in

such a strategy would be assistance in providing the GOZ with the necessary training and research opportunities that remain a unique and splendid feature of American agricultural education. Indeed, whatever the strategy undertaken by the GOZ, the team strongly urges that USAID consider as its chief priority assistance to Zambia that aids it in meeting its personnel requirements in agriculture. The broad elements of such an undertaking appear in Appendix C of this sector assessment. Other donors, such as FAO, the U.K. and Sweden, are presently involved in treating aspects of Zambia's personnel requirements, but its needs are large in this area and the historic accomplishments of the U.S. in agricultural education and related research place it in an excellent position to take the lead in delivering such assistance.

Bibliography

Public Documents

Republic of Zar ia, Annual Report of the Extension Branch, Department of Agriculture, The Ministry of Rural Development, 1st October, 1973, to 30th September, 1974.

Republic of Zambia, Economic Report, 1977, Office of the Prime Minister, National Commission for Development Planning, Lusaka, January 1978.

Republic of Zambia, Education Reform, Proposals and Recommendations, Ministry of Education, October, 1977.

Government of Zambia, The Land (Conversion of Titles) Act, 1975, No.20 of 1975, Lusaka: Government Printer, 1975.

Books

Dodge, Doris, Agricultural Policy and Performance in Zambia, Institute of International Studies, University of California, Berkeley, 1977.

Lombard, C.S. & Tweedie, A.H.C., Agriculture in Zambia Since Independence, Neczam, 1974.

Studies, Papers and Reports

Kay, George, Social Aspects of Village Regrouping in Zambia, Institute of Social Research, University of Zambia, Special Publication, 1967.

IDZ - Central Unit, Evaluation of Intensive Development Zones (I.D.Z.) Programme of the Republic of Zambia, Ministry of Lands and Agriculture, Lusaka, May, 1978.

Knutsson, Gunnar, Report to The Ministry of Lands and Agriculture On Expert Assistance to Agricultural Training in Zambia, SIDA, September 30, 1977

Natural Resources Development College, College Handbook, Year 1977-78, Lusaka, Zambia

Tuthill, Dean F. Thoughts on Land Tenure in Zambia, Unpublished Report, May, 1973.

Tuthill, Dean F., Services to Village Cultivators in the South Ngoni Area if the Chipata District, Miscellaneous Publication 866, Agricultural Experiment Station, University of Maryland, College Park, Maryland, April, 1975.

USAID, Transition in Southern Africa---Zambia, Southern Africa Task Force, Office of Southern and East African Affairs, Africa Bureau, February, 1977.

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UNDP-FAO, National Food and Nutrition Programme, Zambia, The Food Economy of Zambia, ESN: DP/ZAM/69/512, Technical Report 1, Rome, 1974.

UNDP-FAO, National Food and Nutrition Programme, Zambia, Nutrition Status Survey, ESN: DP/ZAM/69/512, Technical Report 2, Rome, 1974.

World Bank, Republic of Zambia, Agricultural and Rural Sector Survey, Report No. 641a-ZA, Vol. I: Main Report and Maps, Vol.II: Annexes I - II, Vol.III: Annexes 12 - 19, General Agriculture Division, Eastern Africa Regional Office, October 20, 1975.

World Bank, Urban Sector Survey, Republic of Zambia, Report No. 490-ZA, Vol. I: Main Text, Vol.II: Annexes, Transportation and Urban Projects Department, Development Economics Department, May 24, 1976.

World Bank, Zambia, A Basic Economic Report, Report No. 1586b - ZA, Main Report, Eastern Africa Regional Office, October 3, 1977.

World Bank, Zambia, Agri-Industrial Development, Report of a Reconnaissance Mission, June, 1978.

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APPENDIX TABLES

I, II, and III

APPENDIX TABLE I

Estimated Gross Value of Marketed
Agricultural Products, Zambia

PRODUCT	VALUE IN 000 KWACHA		
	1974	1976	1977
Maize	19,350	52,100	46,800
Tobacco	6,118	6,300	5,900
Sugar Cane	5,000	6,000	6,000
Groundnuts	425	1,500	1,500
Sunflower	686	3,200	2,500
Cotton	1,400	1,600	3,600
Cereals	78	1,500	2,000
Fruits & Vegetables	3,800	4,000	4,000
Livestock Products	14,000	10,000	10,000
Total	55,857	86,200	82,300
Forestry & Fisheries	3,143	3,800	4,700
TOTAL	59,000	90,000	87,000

APPENDIX TABLE II

Marketed Crop Production, Zambia
By Products, 1964 - 78
In Metric Tons

PRODUCT	1964	1965	1966	1967	1968	1969	1970	1971
Maize	204,270	263,000	384,720	383,080	263,830	273,990	135,200	399,950
Groundnuts	3,630	6,740	11,530	14,810	5,390	7,820	3,270	5,970
Sunflower	-	-	-	-	-	-	4	16
Soya Beans	-	-	-	-	-	-	-	-
Seed Cotton	1,649	2,273	2,778	1,831	4,252	6,915	5,606	12,053
Wheat	-	-	-	-	-	-	-	-
Rice	-	-	-	-	.4	46.6	93.0	169.6

	1972	1973	1974	1975	1976	1977	1978
Maize	616,554	399,152	588,090	559,481	749,972	696,100	657,000
Groundnuts	6,480	3,217	3,626	6,499	9,467	7,462	5,736
Sunflower	163	1,050	4,300	8,243	15,965	13,307	8,850
Soya Beans	-	173	192	683	1,305	1,274	1,440
Seed Cotton	9,327	5,163	2,757	2,636	3,885	8,928	12,000
Wheat	-	-	-	934	3,948	5,323	N/A
Rice	260.3	345.4	357.5	1,008.7	2,093.0	1858.2	2680.0

APPENDIX TABLE III

CROP PRODUCER PRICES 1970/71 -1977/78 Cont:..

	K 1970/71	K 1971/72	K 1972/73	K 1973/74		K 1974/75	K 1975/76	19
SEED COTTON	0.17	0.17	0.17	0.25	Grade A handpicked delivered to Lusaka Ginnery	0.30	0.40	0.
	0.13	0.13	0.13	0.19	Grade B handpicked delivere to Lusaka Ginnery	0.24	0.34	0.
	0.11	0.11	0.11	0.15	Grade C handpicked delivered to Lusaka	0.21	0.31	0.
	0.17	0.17	0.17	0.25	Grade A handpicked delivered to Chipata Ginnery	0.32	0.42	0.
	0.13	0.13	0.13	0.19	Grade B handpicked delivered to Chipata Ginnery	0.26	0.36	0.
	0.11	0.11	0.11	0.16	Grade C handpicked delivered to	0.23	0.33	0.
	0.15	0.15	0.15	0.22	Grade A machine picked delivered to Lusaka Ginnery.	0.27	0.37	0.
	0.11	0.11	0.11	0.16	Grade B. Machine picked delivered To Lusaka Ginnery	0.21	0.31	0.
	0.08	0.08	0.08	0.13	Grade C Machine picked delivered to Lusaka Ginnery	0.18	0.28	0.
	0.15	0.15	0.15	0.22	Grade A Machine Picked delivered Chipata Ginnery	0.29	0.39	
	0.11	0.11	0.11	0.16	Grade B Machine picked delivered to Chipata Ginnery	0.23	0.33	
	0.08	0.08	0.08	0.13	Grade C Machine picked delivered Chipata Ginnery.	0.20	0.30	

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APPENDIX TABLE III

CROP PRODUCTION PRICES 1970/71 - 1977/78

	K	K	K	K			K	K	K	K
	1970/1	1971/2	1972/3	1973/4			1974/5	1975/6	1976/7	1977/8
MAIZE:										
Price per 90 kg. bag)	4.00	4.30	4.30	4.30	Delivered to NAMB main line of rail depots	Grade A	5.00	6.30	6.30	6.80
						Grade B	4.95	6.20	6.20	6.70
					Chipata, Kasama, Mansa and other NPCMU and ECU main depots	Grade C	4.85	6.05	6.05	6.55
						Grade D	4.60	2.50	2.50	
	3.20	3.50	4.00	4.00	Delivered to ECU village markets	Grade E	3.85	2.00		
	5.00	5.00	4.30	4.30	Delivered to Mongu					
	4.80	5.00	4.30	4.30	Delivered to Kabompo	Note:	Regional price differentials were abolished in 1974/75.			
	3.20	3.50	4.00	4.00						
GROUNDNUTS:	10.20	10.20	12.60	17.00	Grade A		1700	25.00	25.00	28-60
(Other than Chalimbana)	-	9.90	12.60	16.00	Grade B delivered to NAMB line of rail depots		16.00	21.00	21.00	24.00
(Price per 80 Kg. bag)	9.60	9.60	12.60	17.00	Grade A delivered to NAMB and NPCMU district centers		17.00	-		
		9.30	12.00	16.00	Grade B delivered to NAMB and NPCMU district centers		16.00	-		

APPENDIX TABLE III

CROP PRODUCTION PRICES 1970/1 - 1977/8

(Continued)

	K	K	K	K		K	K	K	
	1970/1	1971/2	1972/3	1973/4		1974/5	1975/6	1976/7	1977
ROUNDNUTS: (Chalimbana) (Price per 80 kg bag)	10.80	10.80	12.60	17.00	Grade A delivered to ECU main depots	19.00	25.00	25.00	28.
	9.00	9.00	12.00	16.00	Grade B delivered to ECU main depots	17.00	21.00	21.00	24.
	9.10	8.10	11.40	-	Grade C delivered to ECU main depots	15.00	18.00	18.00	20.
	10.20	10.20	-	-	Grade A delivered to ECU village markets	-	-		
	8.40	8.40	-	-	Grade B delivered to ECU village markets	-	-		
	7.50	7.50	-	-	Grade C delivered to ECU village markets	-	-		
PADDY RICE (Price per Kg)	0.09	0.11	0.11	0.18	Delivered at District	0.15	0.18	0.18	0.
SUNFLOWER All Grades (Price per 50 kg bag)	4.62	4.62	6.64	8.95	Delivered to NAMB line of rail depots	9.40	10.00	10.00	12.
WHEAT (Price per 90 kg bag)	-	-	7.50	7.50	Delivered to NAMB	*12.00/16.00	16.00	16.00	18.
VIRGINIA TOBACCO (Price per kg)	0.84	0.90	0.90	0.90	Guaranteed Floor Prices	0.90	1.04	1.04	-
SOYA BEAN All Grades	8.40	8.40	8.40	13.20	Delivered to NAMB line of rail and specified depots	13.20	17.00	17.00	21.

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A P P E N D I X A

Transportation Report

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S A D A P

Transport and the Agricultural Sector in Zambia

Alice E. Kidder
Transportation Specialist

Transport and the Rural Areas

Zambia has devoted five per cent of the SNDP to provincial roads, all from domestic sources. The principal emphasis has been on the development of the national network of roads linking provincial capitals, county seats (bomas), and the central government located at Lusaka. Thirty per cent of the SNDP has been devoted to the national network. The national network inadequately serves the needs of marketing agricultural products and getting the agricultural inputs distributed to rural farmers.

Principal investments in rural roads have come out of requests by the Ministry of Lands and Agriculture to engage in construction of feeder roads. This ministry draws up plans, has its own facilities for construction of rural roads, implements the construction program, and then turns over responsibility for the maintenance of the roads to the Rural Councils or other rural local authorities.

Funds for the maintenance of rural roads are obtained from a portion of the excise tax on opaque beer (popular domestic drink). These funds from the excise are collected nationwide by the Ministry of Finance, turned over to the Ministry of Local Governments, and allocated "on the basis on need" to the rural councils, the arm of the central government operating at each local area. The rural councils do not get any revenue from property taxes; in addition to the excise tax funds the Rural Councils make a profit directly on tavern operations which they run. Roads are viewed as a high priority item in many of the rural areas. About forty per cent of the rural funds are devoted to road maintenance. A constant stream of requests comes forth from these areas asking for relief from grossly inadequate road facilities. The Roads Department is in no position to maintain the rural roads; the work is strictly the responsibility of the rural authorities until the roads deteriorate so badly after 6-8 years that the Ministry of Lands and Agriculture steps

in again essentially to rebuild the roads.

Roads are viewed by several observers as a principal bottleneck to developing agricultural production in several areas: the track in sand from Shangombo to Mwamba in the Western Province is being improved under a loan from the Germans in order to facilitate the transport of cattle. Current weight loss of cattle during the long trek to the abattoir in Mongu may run as high as 30%. This area could use additional rural road capacity. Another example of areas of good agricultural potential suffering from inadequate roads is the area south of the road from Lusaka to Livingstone. This area has good potential for surplus production of maize, tobacco, beef, and market vegetables owing to good soils and adequate water supplies. During the rainy season bridges frequently wash out, dirt roads become impassable, and vital inputs of fertilizer cannot penetrate the area. Two areas were mentioned by the Planning Coordinator of the Ministry of Lands and Agriculture as areas devoid of roads altogether, where new construction could assist the spread of commercial agriculture: portions of Namwala in the Central Province and Lundazi in the Eastern Province.

Interestingly, the inadequacy of rural roads and tracks within a 30 km. radius of the capitol of Lusaka was cited as a fine example of a marketing bottleneck. Transport costs may take 80% of the profits of small scale vegetable farmers who pay dearly to have their produce trucked into the city over nearly impassable roads during the rainy season. Typically, the smaller farmers will pay one of the other farmers with a truck to make the daily runs to Lusaka.

Forthcoming Investment programs for Rural Roads

No information was available on the funds slated under the TNDP by the Ministry of Lands and Agriculture for the construction of rural feeder roads. The TNDP may be available next January.

The Ministry of Local Government has not allocated any Zambian funds for rural road construction per se in the TNDP, according to their Planning Officer. However, 800,000 Kw. ($1 million) is in the budget of the Ministry for projects in two Rural Councils, thanks to the loan being negotiated with the FRG. Additional funds from the EEC may also be devoted to feeder roads as part of a program of rural development of the Eastern Province.

All agencies contacted expressed a wish for more road building and maintenance equipment, for trained manpower to teach improved maintenance techniques to the rural councils, and foreign exchange with which to buy essential spare parts. Many vehicles are currently inoperative at all levels because of an importation ban on exchange to buy spare parts.

The end result may well be disinvestment in rural roads. The roads built by the Ministry of Lands and Agriculture are falling into extreme disrepair in some places. The Rural Councils in the Reserve Lands (previously called the Native Authorities) do not have adequate equipment or sufficient funds to keep up the existing infrastructure of roads. Rural roads in States Land (previously areas populated by Europeans) are virtually neglected as no one feels a responsibility towards these jurisdictions.

Productive Programs for USAID Involvement

a. Selection of one or more districts for restoration of feeder roads where this program would eliminate a constraint to marketing agricultural surpluses.

Agency to manage the project. Ministry of Local Governments, with the involvement of the Local Authorities. Alternatively, the Ministry of Lands and Agriculture could sponsor the project. It was advised that only one ministry be selected to manage the project, as interagency arrangements unnecessarily slow implementation.

Source of planning information. The Planning staff of the Ministry of Lands and Agriculture reviews annual submissions by the land use planning officers at the district level. These plans are called catchment conservation plans, and include road reconstruction programs. At least one plan is available on a portion of each of the provinces, of which there are nine. Current programs may implement one catchment conservation per province per three years, but the program could easily absorb the funds to do one plan per province per year.

Costs: The average cost of the transportation portion of the catchment conservation plan is Kw 100,000 ($125,000). Projects range from Kw 75,000 to Kw 150,000, depending upon length, terrain, drainage, and the like. Two sources estimated the costs of producing a Class III standard road (5.5 m wide, 6 inch gravel, compacted surface) at

Kw 8,500 - 10,000/km. Simple dirt roads may be constructed for Kw 2000/km. Culverts and bridges add considerable costs. Gravel is available domestically but bitumen surfaces must be imported, along with steel reinforcements for bridges. Costs in sand-swept areas such as in the Western Province are much higher as the road must be constructed to stay at least partially free of blowing desert material.

Needed Inputs:

Since the ministries are overworked and understaffed in trained manpower, it would be important to see that construction engineers were added to oversee the program. It is advisable that such a person have two or more years of experience in working conditions and terrain similar to that of Zambia. The University of Zambia produces less than dozen civil engineers annually and few of these if any seek employment in the public sector since salaries are considerably higher in the private companies where recruitment is active.

Some groups such as the Chinese have preferred to bring in their own personnel for the job, training Zambians in entry level construction operations such as use of graders, etc. It is recommended that as much training of technical personnel be included in the project as is feasible, since there is an avowed policy of Zambianization recognized by the central government.

Whereas the Ministry of Lands and Agriculture appears to have sufficient construction facilities, the Rural Councils are lacking in road equipment. It would be necessary to supply such road equipment to the Rural Authorities, to ensure continued upkeep of the roads. Items needed include: front end loaders, tippers, light graders, and rollers. Also the RC's need workshops for repairing vehicles cement mixers for concrete level crossings, and a supply of spare parts to keep the vehicles running.

8. Program of Staff Development for the Department of Roads

This project would indirectly benefit the rural areas by enlarging the technical staffs of the Department of Roads, thus enabling them to serve more areas, enlarge the national grid to include more rural areas, and assume some more of the road maintenance functions from the rural councils.

Agency to manage the project: the Department of Roads, Ministry of Public Works, in conjunction with the Roads Training School, Lusaka, which is operated for the Department of Roads.

Source of Planning Information: A feasibility study would have to be undertaken initially, as no planning for this form of training is currently undertaken.

Facilities: the Roads Training School, Lusaka, has a capacity to board 80 students, and classroom capacity for eighty. The number of students in the inservice program of entry level and supervisory training fluctuates in actuality from seven to eighty. One year's prior scheduling would be necessary to book the facility for the necessary courses. Another alternative to be explored is the roads training program of the rural areas training at Chalimbana. This did not permit contact with this unit, or exploration of the feasibility of using these facilities.

Program Objectives: Addition to the staff of construction and maintenance engineers who could train supervisors and higher technical staffs to cope with, and communicate supervision; review of existing curriculum and entry requirements of the Roads Training School to assess relevance and applicability to conditions in Zambia; addition of maintenance vehicles to enable the Department to service more rural roads.

Impact: Nationwide. The Roads Department should not only occasionally obtain personnel from the rural councils, as the program of the Roads Department currently focuses exclusively on the national grid of major roads. Enlargement of its road maintenance could broaden the impact of the Roads Department in areas of agricultural surplus.

Inputs: one or more consulting engineers to serve in a training capacity; road vehicles; spare parts; subsistence allowance for trainees.

Costs: $250,000 (estimated) - $1 million, depending on vehicle acquisition.

C. Enlargement of feeder road quality in the environs of Lusaka

This project would reduce the transport costs of commercial farmers (principally Zambian) who sell fruits and vegetables in truck gardening style daily to the urban markets of Lusaka. Reduction of these costs might be expected to stimulate production, given added profits, particularly during the rainy season.

Agency to manage the project: I recommend the Land Use Office of the Ministry of Lands and Agriculture, as these lands are principally State lands, and are not repaired by either the Rural Councils or the Department of Roads. The area is potentially very productive agriculturally, and proximity to Lusaka enhances the economic potential.

Source of Planning Information: Planning Division and Land Use Office, Ministry of Lands and Agriculture

Program Objectives: Materially improve the condition of feeder roads leading from commercial farms in the 50 km radius of Lusaka; significantly lower the transport cost to low income farmers, encouraging the production of higher levels of agricultural surpluses.

Facilities: Utilize the construction equipment available through the Ministry of Lands and Agriculture, but supplement with added equipment, as necessary; will need to add technical staff to the Ministry to facilitate the project; cost of laborers' wages,

building materials, etc.

Impact: Local, but high visibility because of proximity to Lusaka;

Costs: Varies, depending on scope; cost per km $12,500.

ABBREVIATIONS

EEC - European Economic Community

FRG - Federal Republic of Germany

Km - Kilometer

Kw - Kwatcha (Zambian currency $1.00 = .80 Kwatcha)

RC - Rural Councils

SNDP - Second National Development Plan

TNDP - Third National Development Plan

ANNOTATED BIBLIOGRAPHY

World Bank, Republic of Zambia, Agricultural and Rural Sector Survey Volume III, October 1975.

The best summary of Transport in Agricultural Development in Zambia occurs as Annex 32 in this document. It reviews policy and programs under the SNDP, provides statistics through 1973, and describes administrative arrangements. Some policy changes have occurred since 1975. Also, the treatment neglects the work of the Ministry of Lands and Agriculture, q.v.. Otherwise, it appears to be the best source of information on the topic.

United Nations Development Program, Report on Development Assistance to Zambia, 1974.

Pages 77 - 81 describe the following projects related to agricultural transport:

Denmark: Automobile electrician in maintenance at Mimosa Training Center, Chilanga, National Transport Corporation

France: 1 scholarship for road transport training in France (not restricted to rural issue only)

National Agricultural Marketing Board, List of Transporters who applied for Tender, 78-79 season. May 16, 1978 mimeo.

Provides a list by area of transport providers. These are private firms who work on a fixed contract with the National Agricultural Marketing Board. Indications are that there is sufficient supply of transport services available from the private sector.

USAID, Southern Africa Transportation Program Planning Study, September 1976.

Brief section on Rural Roads, pp. IV-16-18." There are 32,000 Km of earth roads and tracks in Zambia and Malawi alone. Raising these to a minimum earth feeder road standard would cost an esti-

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mated $150 million to $300 million, depending on the standard of road desired and the current state of the thousands of kilometers and tracks involved." (p.IV-16).
Reviews the requirements of a feasibility study on feeder roads.

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A P P E N D I X B

Livestock Specialists Report

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S A D A P

Report on the Livestock Industry in Zambia

Dee L. Cross
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I. Description of Livestock Industry

A. Beef Cattle

There are approximately 2 million cattle in Zambia of which approximately 15% (.3 million) are raised commercially. The remainder (1.7 million) are kept by traditional farmers under commercial grazing conditions.

Observations of commercial and traditional sectors suggest that the commercial sector responds to high prices with increases in beef production as fast as possible, subject to prevailing constraints. Realistic projections of increases in production by commercial farmers (including state production units) cannot keep pace with expected increases in demand nor meet present demand for beef. Unlike the commercial sector, the traditional sector characteristically has not responded to higher prices like commercial farmers. Generally, traditional people sell cattle only to meet a specific and occasional need. The production of beef by traditional cattle owners generally is not undertaken with the object of securing disposable income for day to day needs. Therefore, if a substantial increase in production is sought from this sector something more than manipulation of prices has to be done.

In the traditional sector lies the greatest possibility for increased beef production. Also, raising the standard of living for the traditional farmer is in line with the policy of "humanism".

Production parameters are not known with any degree of accuracy in the traditional herd. Calculation made from cattle census figures, numbers taken off for slaughter and sample observations in the field, indicate an average effective calving rate of 35%. This is estimated to be the result of an average actual calving rate of 42-46% and an average calf mortality of between 18-22%.

Mature slaughter weight in traditional cattle is reached between 5-6 years of age. However, the average age of cattle marketed for slaughter is estimated to be 8-9 years.

Adult mortality is estimated to be approximately 4.3% per year. When combined with the 20% calf mortality, the resultant overall mortality is 7%. Adult mortality, at present, accounts for approximately 58,000 cattle per year.

The average calf dressed weight of carcasses from the traditional sector (according to Cold Storage Board Records) is 157 kg.. However, the average live weight of the traditional cattle has been assumed to be 320 kgs.. For cattle slaughtered in the rural areas, the average carcass weight is assumed to be 148 kgs. since this is the average of commercial grade carcasses. The calculated rate of off-take from the above is estimated at 7.9% of edible meat (an additional .7% represents amount of meat salvaged from dead cattle, not slaughtered).

Item	% Off-Take
Marketed through CSB (actual)	1.14%
Sold to private butchers (est.)	2.11%
Meat salvaged from deaths (est.)	.7%
Percapita consumption in villages (including off-take for social purposes)	4.2%
Total	8.2%

B. Dairy Cattle

Zambia has a small dairy industry. Expatriots run most of the dairies. The departure of many of the expatriot dairymen along with the government's "Cheap Milk Policy" (a policy to make milk available to many consumers at affordable prices via government subsidies) put a strain on the small dairy industry which is mostly run by the commercial sector (60%).

Last year (1977) Zambia produced 30-40 million litres of fresh milk and imported (in the form of recombined milk) 25 million litres of fresh milk equivalent. *

*(These figures do not correspond to other sources, again, the difficulty of determining accurate data. - DFT)

Rural farmers have 2 to 11 crossbred dairy cows, typically. The state helps them with extension activities and more suitable livestock, as far as possible. In the traditional sector it is estimated that 25 million liters of milk is consumed by the local people (indigenous production). This apparently is largely from what has been discussed as the beef cattle herd under subheading (A). Nothing is being done in this area.

Presently, the government has 40 dairy farms which they plan to reorganize under one management. It is estimated that there are 250,000 dairy cattle presently on commercial dairy farms.

C. Swine

At the time of Independence, most of the marketed swine production was by expatriate farmers. It is estimated that 82% of the total marketed production comes from private commercial farmers. Zambians are entering the swine production area. Commercial production is mainly concentrated along the line of rail. Production of pork has increased to the level that import of pork and pork products was stopped in 1976.

D. Poultry

Poultry production has achieved increased growth recently. The number of day-old chicks produced increased from 4.2 million in 1969 to 15.6 million in 1976 suggesting a growth rate of 20.5% per annum. Increased production in this area has helped to meet the supply gap created by the shortage of beef. Estimates of % marketed poultry by traditional and commercial sector nor estimates of production and consumption in the traditional sector were not obtained.

II. Major Constraints to Increased Livestock Production
(Listed in Order of Priority)

Increased beef cattle production appears to be major opportunity to increase animal food production. No attempt has been made to rank dairy, swine or poultry in order of importance, primarily because it is felt that they have approximately equal [illegible] nity for increased animal food production and are secondary t[illegible] Also increased beef

production offers greater possibilities for increasing the standard of living for the traditional farmer than other livestock enterprises.

A. Livestock Industry In General
   1. Lack of Trained Manpower
   2. Lack of infrastucture
   3. Poor animal husbandry practices
   4. Lack of protein concentrate (for swine, dairy, poultry)
   5. Prevelance of animal diseases and parasites
   6. Lack of quality breeding stock

B. Beef Cattle
   1. Lack of trained manpower
   2. Lack of infrastructure
   3. Poor animal husbandry practices
   4. Prevelance of animal diseases and parasites
   5. Lack of quality breeding stock

C. Dairy Cattle
   1. Lack of trained manpower
   2. Lack of infrastructure
   3. Lack of quality breeding stock
   4. Lack of protein concentrate

D. Swine
   1. Lack of trained manpower
   2. Lack of infrastucture
   3. Lack of protein concentrate
   4. Lack of quality breeding stock

E. Poultry
   1. Lack of trained manpower
   2. Lack of infrastructure
   3. Lack of protein concentrate

III. Recommendation for Relief of Constraints on Beef Cattle

As already mentioned, it is felt that the best approach to increasing the productivity of the livestock industry and the standard of living for the indigenous population and subsequently all of the population is through the traditional beef cattle sector.

Major bottlenecks in the livestock industry as a whole, are trained manpower and lack of infrastructure. Many projects by donors have and are presently having little impact on the economy of Zambia because of these two constraints and because these projects have looked at very specific segments of agricultural production without consideration for other vital interrelated segments. Thus, to have a significant impact on the economy, projects must be implemented which meet all the constraints for that agricultural product. To do this on a country-wide basis would be beyond the scope of any one donor for any area of agriculture. However, this could be done on a regional basis and expanded nation-wide as production increases, i.e., increased production could pay for much of the costs of expansion into other regions of the country.

Another consideration of primary importance to the success of any project is the acceptance of the project by officials in the government not to mention others all the way down to the farmer. Quite surprising is the fact that the Republic of Zambia Ministry of Lands and Agriculture has proposed a project for cattle which has striking resemblance to this concept. The project is referred to as "Cattle Development Project" (CDP) and is proposed for three regions of Zambia. This project is well conceived and thoroughly planned. The major concern about the planning in the project is in the area of trained manpower. It is felt that additional training and support for the extension staff would be required to obtain success with this approach.

References

1. Personal Communications with Personnel in the Ministry of Lands and Agriculture, Republic of Zambia (Akofekwa, Masambi, MaGandi, Savage, D'Cruz, Robertson, Iverson, Nurse, Woods, and others).

2. Personal Communications with Research Personnel at Mt. Makulu Research Station

3. Personal Communications with Personnel at University of Zambia

4. Cattle Development Area Project, Ministry of Lands and Agriculture, Republic of Zambia. March 1978.

5. Nagi, R.P. 1977. Livestock Sector in Zambia

6. Zambia. In: Africa South of the Sahara 1977-78. London, Europe Publ. Limited, 1977.

7. Abercrombie, F.D. 1974. Range Development and Management in Africa.

A P P E N D I X C

SOUTHERN AFRICA DEVELOPMENT ASSESSMENT PROJECT

THE AGRICULTURAL EDUCATION SECTOR IN ZAMBIA
CONSTRAINTS AND OPPORTUNITIES

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INTRODUCTION

The government of Zambia (GOZ) since independence in 1964 has averred that agriculture has an important role to play both in feeding its population and in diversifying its copper export-dependent economy. Various development planning documents have urged all Zambian citizens to take cognizance of the centrality of agriculture. School children and homeowners have been exhorted to plant gardens; subsistence farmers are called upon to enter the cash crop sector; and so-called emergent and modern Zambian farmers have been told to increase their production. No less a personage than President Kaunda has appeared on tv and radio as well as in print to underline this message. The message is nevertheless having difficulty in getting through.

This analysis will examine agricultural development in Zambia from the perspective of manpower. It will attempt to locate manpower-related constraints to Zambia's agricultural development policies and will conclude by suggesting certain areas where constraints can be alleviated by American assistance. It will concentrate on three basic areas of manpower-related concerns: the delivery system of agricultural services to the farmers; the formal agricultural education sector; and, the coordination of agriculture planning and execution between the Ministry of Lands and Agriculture, other ministries and/or institutions, and international donors. The basic caveat underlying the efficacy of future American involvement as suggested herein will be the degree of genuine dedication exhibited by the GOZ in actualizing its declared intent to make agricultural development a priority.

DIMENSIONS OF AGRICULTURE MANPOWER NEEDS

Before examining present day manpower constraints in the agriculture sector in Zambia it would be helpful to ascertain just what the GOZ perceives its agricultural manpower needs to be. This task is not as easy as it seems for as Robert Klepper[1] points out, there are no detailed analyses providing such data. Studies done often fail to differentiate between types of manpower. Even when it is assumed that manpower means trained manpower, little differentiation is made between university graduates and degree and/or certificate holders from technical schools. Further exacerbating the problem is the frequent omission of employment categories outside the Ministry of Lands and Agriculture: e.g. parastatals and private employers.

Given the problems in macroanalysis it becomes necessary to examine individual programs, ministry subunits and the like in order to get a reasonable fix on the

1/ Robert Klepper, "Manpower Demand in the Agricultural Sector in Zambia" (Lusaka: School of Agricultural Sciences, 1978).

dimensions of the problem. From this microanalytic perspective it becomes clear that serious appropriate manpower shortages exist and will continue to for the foreseeable future. Within the extension service staff, for example, the first national development plan called for 77 professionals (i.e., those with a university degree) while the actual number reached by 1970, formally the last year of the plan, was 35.[2] The second national development plan projected a need for an additional 55 graduates for extension alone while the total number of agricultural graduates by 1976, the last formal year of the second national development plan, was 54, at least ten of which were absorbed by the University of Zambia's faculty of Agriculture. An FAO study[3] has established that in fact no more than 20 of these remaining graduates were employed in all of the public agriculture sector in 1975. The same study questions the ability of the University of Zambia to achieve Government-projected rates of expansion.[4]

Similarly, the Government projected a need for 1,150 mid-level technical staff in agriculture extension while the actual number of technical school graduates was more like 425.[5] These shortfalls in extension are mirrored in virtually every other unit. Exacerbating the problem is the slow pace of Zambianization of agricultural units. The planning unit, for example, has 24 staff only three of which are Zambians. Thus, despite the lack of reliable overall manpower planning figures, one can find in every subsector of agriculture serious shortfalls of trained manpower. Every government official interviewed stressed this point. The message is clear--Zambia needs to develop a means for more effectively meeting its agricultural manpower requirements. Given Zambia's present, serious economic constraints and the need for more skilled indigenous manpower in virtually every sector of the economy, however, it is difficult to see just how the Government will meet its manpower needs without generous foreign assistance and tough-minded domestic prioritizing. Assuming that the GRZ stands by its commitment to give 'the highest priority to rural development,

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2/ Second National Development Plan (Lusaka: Ministry of Development Planning and National Guidance, 1972), p.73.

in general, and to increased agricultural productivity, in particular",[6] three interrelated agricultural manpower issued must be squarely faced: delivery of extension services; provision of trained personnel; and, coordination of the agricultural sector programs if short, medium, and long-term solutions to the situation are to be achieved. It is to these concerns the study now turns.

DELIVERY OF SERVICES TO FARMERS

The Extension Service

The GOZ possesses an extension infrastructure which has the potential to be one of the most effective in Africa.[7] It is the one state organization that in fact reaches the mass of small and poor farmers in Zambia to provide them with assistance. Such assistance is proffered through some 542 village camps scattered throughout Zambia (see Table I) at which local level agricultural assistance and commodity demonstrators interact on a daily basis with their clientele.

TABLE I

Distribution of FTCs and FIs

Province	Number of camps	Area of Service Ave. sq. mis.
Central	66	263
Copperbelt	18	255
Eastern	96	250
Lusaka	47	220
Southern	75	496
Northwestern	52	197
Southern	138	91
Western	45	313
Total	542	Ave. 246

SOURCE: G.L. Godel, An Analysis of Zambia's Agricultural Camps, 1972 (Lusaka, Department of Agriculture, 1973), pp. 4,7.

3/ P.C. Packard, F. Stores, and A. Mafeje, In Service Training for Agricultural and Rural Development in Zambia (Lusaka: FAOTF-RAF100 SWE , 1975) p.5.

4/ Ibid., p.6.

5/ Ibid., p.9

6/ The Current Economic Crisis, Government Responses and Approach to the Third Plan

One function of the camp staff is to recruit farmers from their locales to receive more extended assistance in the form of one week residential training courses at one of Zambia's 35 (thirty-five) Farmer Training Centers or Farm Institutes.* These centers and institutes are well-located throughout the country.

Administratively, field staff report to District Agricultural Officers (DAO's) who in turn report to Provincial Agricultural Officers (PAO) who are overseen by the Deputy Director of Extension. The FTC's and FI's are directed by Provencial Extention Training Officers (PETO) who report to the PAO. In actual numbers as of 1976, there were approximately 950 commodity demonstrators, 521 agricultural assistants, and 435 technical and professional staff.

Despite its suitable location and penetration potential, the extension service has been hampered by serious manpower constraints. This can be seen on four levels: manpower shortfalls; levels of expertise; the nature of training; and, the role of women.

Manpower Shortfalls

The Ministry of Lands and Agriculture has proposed the elimination of commodity demonstrators. It anticipates replacing them with agricultural assistants. At present, as Packard et al point out[8], agricultural assistants each oversee about 700 farm families in some 30 villages within a 600-700 square kilometer area. With extant travel and environmental limitations there should be a ratio of no more than one to two hundred implying an increase of field staff to approximately 3,000. As can be seen in Table II, the failure to meet little more than half of the established Second National Development Plan levels by 1976 raises questions as to whether the Third National Development Plan goas are realistic or attainable.

7/ David Honeybone and Alan Marter, An Evaluation Study of Zambia's Farm Institutes and Farmer Training Centers (Lusaka: Rural Development Studies Bureau, 1976), p. 70.

* Farm Institutes were established to train commodity demonstrators, the juniormost personnel in the Agricultural Civil Service. Over the years their functions have become blurred with those of the Farmer Training Centers and in practice they are as often as not used as FTC's as they are for training commodity demonstrators.

8/ "In Service Training...", p.21.

TABLE II

Extension Staff Requirements and Shortfalls

SNDP 1976 Establishment		1976 Actual	Shortfall
Professional	88	45	43
Technical	434	390	44
Field Staff	1,200	521	679
Total	1,722	956	766

SOURCE: FAO: In-Service Training for Agricultural and Rural Development in Zambia (Lusaka: Development Research and Training Service, 1976), p. 21.

At the village camp level, there are many locations where there are fewer staff than camps (see Table III). Thus both the program "on the ground" and the projected one face serious manpower shortfalls.

TABLE III

Number and Distribution of Field Staff

Province	Number of Field Staff	Number of Field Staff Per Camp
Central	68	1.03
Copperbelt	42	2.33
Eastern	68	0.71
Luapula	34	0.72
Northern	74	0.99
Northwestern	64	1.02
Southern	46	0.34
Western	60	1.43
Total	456	Ave. 0.84

SOURCE: N. Mukutu, The Department of Agriculture Extension Services (Lusaka: Department of Agriculture, 1975), pp. 3-5.

The present extension system is also hampered by lacunae in trained manpower. Honeybone and Marter[9] establish that roughly one-third of the agricultural assistants they interviewed had no secondary education at all placing them well below the extant post requirements. Within the training sector of extension, not all the FTC's or FI's have even one appropriately trained technical officer on location. There were no shortfall breakdowns provided for midlevel and technical staffpersons but the thrust of every interview was that these officers were overwhelmed by their workload and needed additonal training to make them more effective. Management, educational, and specific agricultural science skills were those areas where assistance was most frequently mentioned.

Nature of Training

Related to the problems of appropriate levels of expertise are how such expertise is provided. At the base of the present extension system is the commodity demonstrator who receives a twelve week crash course at a Farm Institute and then serves for up to two years as a probationary measure prior to entering a two-year certificate course at one of the certificate granting colleges-Zambia College of Agriculture (ZCA) at Monze or the new college at Mpika. Technical training is given at the Natural Resource Development College (NRDC) at Chelston and professional training at the University of Zambia.

The nature of the training process was criticized on several grounds. Some interviewees felt that the commodity demonstrators were given too little training to be effective. Others argued that the entire extension staff from the commodity demonstrators on up were given too technical an education. They stated that it was essential for all those in extension to receive more training in communication and educating skills. A frequent complaint was that there were too few opportunities for improving their skills once in service. The absence of in-service training denied field workers

9/ Honeybone and Marter, pp.22-23

access to the latest techniques and information and also largely eliminated opportunities for upward mobility within the extension service. Finally, even as it was argued that training was too technical, it was also averred that training was too general. While this permitted easy transferability (itself a frequent complaint) the lack of specific skills training hindered the efficacy of the service in the field. In the case of the FTC's for example, it was argued that the staff received the same training as the agricultural assistants and thus both were imparting the same information. This redundancy was one factor leading farmers to being disinclined to attend the FTC's.[10]

The Role of Women

Estimates indicate that upwards of 80% of the food grown by Zambian farmers for domestic consumption is raised by women. Demographically, it is the case that women outnumber men in rural areas of Zambia two to one and in more than 20% of rural households, women are the only adults present.[11] Thus women are a critical group as potential receptors of Zambia's extension services. For cultural reasons, however, it is unlikely that male extension workers can gain access to these farmers to provide them with such services. Given this situation, it would appear natural for there to be a large number of women in the extension service. In fact there are a mere handful and these are usually found in home economics-related fields at FTC's. When confronted with this problem, GOZ officials were quick to agree that it exists but insisted that there was nothing stopping women entering the extension division save the small numbers of women with necessary education qualification and their lack of interest in so doing. As of 1976, there were no women graduates in agriculture from the University of Zambia. An interviewee at the National Resource Development College estimated that there would be about four women out of 160 new students entering in 1978. Clearly the emphasis of the extension service upon case crops (an historically

10/ Honeybone and Marter, p.20.

11/ Ibid., p.31.

male dominated sector worldwide) biases the likely composition of the service.

There are other problems that the extension service faces, some of which will be treated shortly. This in-depth examination of specific manpower problems in this one subsector is meant to provide the reader with a sense of the dimensions of the prevalent situation. It is not meant to be exhaustive or imply that other units within the Ministry of Lands and Agriculture do not face similar problems. A brief examination of other units and parastatals delivering services to farmers will indicate quite the contrary.

An examination of the Department of Cooperatives and Marketing, for example, discloses that Zambia with 700 cooperative societies and a membership of over 50,000 has only begun to meet training needs beyond the junior officer level now provided at Luanshya Cooperative College. Virtually all interviewees when questioned about the manpower needs in the cooperatives area stressed the need for more qualified manpower there. Presently, at the NRDC, only one course is offered on cooperatives.

The GOZ has attempted to mobilize rural youth through the development of young farmers clubs. Those units are overseen by a mere eight provincial officers and, as a result, many such clubs are units in name only.[12] The effective growth of such clubs requires at the minimum officers responsible for them at the district levels in coordination with local extension and rural development council staff. But such staffing and coordination remain unrealized.

The overall picture that emerges from an examination of the ten agriculturally-related parastatals mirrors the manpower constraints see above. Not only are there insufficient numbers of administrators and supervisory personnel, but those academic institutions charged with the task of providing more are simply unequal to the

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12/ Extra-Mural Studies Department, National Conference on Agricultural Education and Training Report (Lusaka; 1974).

task.[1] Even where, numerically, Zambian managerial manpower is present, serious problems remain. For example, although Zambianization has proceeded more rapidly in government organization such as parastatals, a recent study[2] indicated that two-fifths of those holding managerial positions are not yet qualified to hold such posts.[3] When querried about training needs, executives responded that "69 percent of thr training needs of managers and supervisors were for management and supervisory training."[4] This need is not being met through in service training programs either. A brief examination of three of the agricultural parastatals discloses some of the dimensions of these problems.

The Agricultural Finance Corporation (AFC) a parastatal concerned with the vital provision of loans to farmers was described as having serious manpower problems both in quantity and quality. With respect to the latter, management, accounting, and loan processing and recovery were all seen as falling below hoped for performance standards. This area is deemed critical for the success of the Third National Development Plan and merits serious AID attention.

Another parastatal that was frequently mentioned as having quite serious manpower problems is NAMBOARD, a major marketing organization in Zambia. NAMBOARD has the responsibilities of supplying inputs to farmers (ssed, fertilizers, persticides, and the like) as well as purchasing produce. As will be seen shortly, NAMBOARD has serious coordination problems with other units in the rural areas. The quality of service was seen as hampered both by the lack of trained manpower and constraints in its supply functions. These latter often hinge on serious transport problems when delivering inputs and when transporting outputs. Trained manpower in mid-level field personnel was seen as an especially acute problem.

ILO/UNDP/Republic of Zambia: Final Report of the Zambia Managerial Manpower and Training Needs Survey of the Private and Parastatal Sectors, 1977

1. p.vii
2. cite title
3. p.vi
4. Ibid

Similarly, the Tobacco Board of Zambia (TBZ) was often singled out by interviewees as a parastatal in dire need of improved manpower. The National Commission for Development Planning in its 1978 economic report pointed specifically to the "shortage of competent managers and extension officers* at most of TBZ's schemes...and lack of competent farm machinery mechanics..." resulting in adverse production.[13]

The picture that emerges from an examination of the delivery of services to farmers, then, is one of potential, seriously constrained by the lack of trained manpower. Both quality of training and sheer numbers of those trained presents special problems for consideration by American and other donors. These two criteria are clearly linked to the formal agricultural sector which will be examined next.

THE FORMAL AGRICULTURAL EDUCATION SECTOR

Despite GOZ claims regarding the primary and salutary role of agriculture, school children often receive an introduction to agriculture which leaves them with quite a different impression. Most primary schools have school gardens but the maintenance of these plots is frequently accomplished by the teaching staffs using this task as a punishment. Forced to work on these plots for bad behavior, children come to view agriculture from a negative perspective during their most critical impression-forming stage of growth.[14] Little in the way of integrating agriculturally relevant examples into math and science classes has taken place.

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* The TBZ provides its own extension officers to deal with farmers growing tobacco and on its burley crop schemes in the eastern region. The entire burley crop is grown on TBZ schemes.

13/ National Commission for Development Planning, Economic Report 1977 (Lusaka: Office of the Prime Minister 1978), p. 36.

14/ National Conference on Agricultural Education..., p.33.

Zambian young men and women are first exposed to formal agricultural education in secondary schools where courses are taught to the Form III level. These courses are voluntary, however, and are offered at approximately two thirds of the existing secondary schools.

Career training begins with the previously mentioned twelve-week crash course for commodity demonstrators at one of the Farm Institutes after which a year or more of probation as a field demonstrator is undertaken. Following this, successful demonstrators are enrolled in either a two year certificate course or a three year diploma course. The former are taught at the ZCA campuses at Monze or Mpika: the latter at the NRDC at Chelston near Lusaka. Students interested in veterinary science enroll at Monze for one year and then transfer to Mazabuka for their second year where they receive certificates as veterinary asssistants. Students desiring similar training in fisheries may have to wait until one of the two certificate-granting institutions (both operating on an ad hoc basis) responds to an express need for junior level fisheries technicians and enrolls a class. Students interested in forestry enroll at the small Mwekeru Forestry College.

The NRDC as a three year institution grants diplomas in agriculture; livestock sciences and production; water development; agricultural business and management; nutrition; agricultural education; fisheries and agricultural engineering. As such, it provides the GOZ with its mid-level technical personnel in agriculture and agricultural education as well as personnel for parastatals and the private sector.

The School of Agricultural Sciences at the University of Zambia is Zambia's sole degree-granting institution. Located in Lusaka, the school provides four year training in agricultural engineering, animal science, crop science, rural economy,

and extension education; and, soil science. These disciplines are aggregated into a single, comprehensive four year course designed to provide graduates with a general background in all facets of agriculture. This institution thus provides Zambia with all its domestically trained professionals. At the present time there are no facilities for pursuing graduate degrees in agriculture in Zambia. Those seeking specific skills or graduate training in agriculture usually do so in the West (the U.K. and U.S. and other Commonwealth countries predominate in the provision of such training). The constraints that emerge from an examination of the formal education system from a manpower perspective prove to be those of historical precedent, the perceived role of agriculture and agricultural education, and the nature of the curriculum.

Historic Precedent

The history of agriculture in Zambia reveals that the British had little interest in developing agriculture into a modern sector for Africans. As part of the Federation of Rhodesia and Nyasaland, exploitation of Zambia's mineral wealth was stressed. A small number of European farmers were encouraged to provide the necessary food stuffs for the burgeoning mining industry and whenever Africans tried to compete with these farmers, discriminatory pricing, quotas, and other legislation was enacted to curtail it.[15] The wages paid to miners in the urban areas rapidly outpaced the income available to farmers, and, coupled with the government disincentives mentioned above, served to play down the inclination of many Zambians to engage in farming. In the education sector, training for agriculture was related to low level vocational education. At this time most formal education was unavailable to Zambians, being

15/ See Dorothy Dodge's lucid account of this period in, Agricultural Policy and Performance in Zambia (Berkeley: IIs, 1978), pp.1-75.

largely reserved for Europeans. Despite government pronouncements to the contrary, policy through the first two national development plans has strengthened rather than weakened the historic decline in the status of agriculture. Between 1964 and 1968 the real per capita income of miners rose from K960 to K1300 per annum - a 35% increase. Wage earning in sectors outside mining rose from K420 to K640 per annum while the real per capita income of farmers rose from K140 to K 145 - a mere 3.6%.[16] During the Second National Development Plan agricultural performance was probably little better than 1.1% increase per year or virtually stagnant.

The Perceived Role of Agriculture and Agricultural Education

Not surprisingly, the general view of agriculture among the population, GOZ civil servants, and agricultural employees in particular has been pessimistic. As will be shown later, demoralization among agricultural staff is thought to be widespread. At the secondary education level only two-thirds of the schools have agricultural courses and the status of the agricultural teachers offering such courses is so low that the yearly attrition rate among them approaches 20%. This problem is exacerbated by low rates of pay in education in general resulting in real disincentives to talented youth to engage in such teaching. Many headmasters were thought to be unsympathetic to agriculture at their schools and as a result agricultural instruction received little support and school production units at their institutions were barely developed. This negative view toward agriculture also extends to the parents of students insofar as they tended to perceive a career for their child in agriculture as an admission of failure in formal education. This is also reflected in the quality of entrance in the certificate and diploma courses. There, students who couldn't qualify for other training or university entrance wound up in agriculture as a least best alternative. At the university level it has been found necessary to dragoon students into agricultural sciences - very few entrants list agriculture sciences as their first or even second

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16/ Report of the Second National Convention on Rural Development Income, Wages and Prices in Zambia: Policy and Machinery (Kitwe: Government Printer, 1969), p.42.

choice. Given the low status of agriculture and the rapid pace of urbanization potential entrants into the agriculture sector see the likelihood of long years "stuck" in remote field assignments as particularly unattractive.

The Nature of the Agriculture Curriculum

The agriculture curriculum as developed for secondary schools has been criticized as being out of tune with the rest of the school curriculum. Given the high degree of emphasis upon formal education throughout Zambia's education system, this is likely to be true but the remedy lies only in part with altering the extant secondary agriculture curriculum. In this regard it was averred by interviewees that the preparation of secondary agriculture teachers at NRDC was such that it was not well interfaced with the realities of Zambian secondary education. But when pressed for examples respondents became vague referring only to inadequate teaching skills and preparation. At this critical level it would appear that if the GOZ is serious about emphasizing relevant education as well as the primacy of agriculture, the entire curriculum and not just agriculture education alone will require extensive revision. In fact, the Ministry of Education has just released its long awaited education reform and although it concentrates largely upon structural reform, it argues for the need for a more relevant curriculum.[17] Interestingly, while math, science, and technical education are stressed as requiring greater attention the education reform document does not make a specific case for more intensive agricultural education, although it recognizes the need to give agricultural education teacher training higher priority.[18] A separate but serious problem is that a serious shortage of teaching materials and science equipment impacts most heavily on remote, rural schools leaving agriculture teachers as well as other science teachers without supplies necessary to be most effective in the classroom.

17/ Ministry of Education, Education Reform (Lusaka: Government Printer, 1978), pp.29-37

18/ Ibid., p.71.

At the technical (i.e. certificate and diploma) level one finds evidence of highly formal technical education which while preparing Zambian youth to engage in a wide spectrum of activities suffers from certain drawbacks. Chief among them are the lack of practical preparation* for employment and the acquisition of a "new language" replete with technical terms that impair the ability of graduates to speak with farmers in the field. A general complaint registered by the senior staff in most divisions in the Ministry of Lands and Agriculture was that this emphasis lacked focus on communication skills and that technical field needed to be better teachers.

At the technical colleges themselves problems with curriculum were tied to problems with staffing and in the condition of the physical plant. It was argued at NRDC, for example, where only three of 36 staff are Zambians that the institution built for a hundred or so students was bursting at the seams with its present complement of 450. This meant that teaching had to go in the direction of straight lecture rather than small seminar calsses and that the library was woefully inadequate both in terms of size and number of holdings to be of much use to the students or faculty. Further, with 24 contact hours a week (in the U.S. 6 to 12 is the norm: 18 is thought excessive) faculty have little time to devote to classroom planning.

At the university level one is immediately struck by the disjuncture between the physical appearance of the School of Agriculture and the claim by the GOZ of the importance of agriculture in Zambia. Unprepossessing, located in a single block of buildings a quarter of a mile from the main campus (which nevertheless students must walk to in order to take their science courses) one's first impression is that one has come upon lower staff housing rather than the School of Agricultural Sciences.

The curriculum was characterized by many interviewees as being too formal and too

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* This issue was both raised and challenged at NRDC where the ethos places high priority upon professional preparation and possession of credentials. It was argued that previus experience as a commodity demonstrator provides plenty of practical experience. Lack of practical training was also blamed on lack of equipment and practical training facilities.

general. In its defense the staff interviewed replied that the lack of a farm close by (the university farm - just acquired - is 11 kilometers from campus) and the constraints of physical space in their present location militate against more practical education experiences. They acknowledge the general agricultural education their students receive but reply that this is only following the dictates of the government [19] which called for such preparation. Formality, however, leaves the agricultural generalist without a really adequate picture of the life of the people he or she will spend their professional careers assisting. Formality also appears with respect to rigid entrance rules. Diploma holders wishing to enroll at the University of Zambia despite great similarity in course offerings receive no credit for this prior education and must begin as freshmen. Certificate holders wishing diplomas, however, receive some credit for their previous training.

The point of this review for constraints within the formal agricultrual education system has been to establish the impact that such constraints have upon providing much needed manpower in the agricultrual sector. These constraints underline many of the manpower problems confronted by the GOZ in providing effective services to farmers. There are manpower problems within the formal agricultural education sector itself. Inadequately trained FTC and FI staff, high turnover of staff at the secondary levels, the lack of indigenization of staff at the NRDC, in Mpika, and high pupil-teacher ratios mentioned all affect the output of suitably prepared personnel. Working against such odds, the formal agricultural education sector has done remarkably well. Nevertheless, it needs help.

COORDINATION

The GOZ has in the fourteen years since independence attempted a number of agri-

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19/ See, National Conference on Agricultural Education..., p.7.

cultural projects, many of them ambitious. Manpower shortages have directly and often adversely the Government's ability to achieve even modest results. The demands for talented personnel are such that when evidence of such ability in a person surfaces he or she is frequently transferred or is lured to another ministry, parastatal or the private sector. This constant shifting of personnel undermines the ability of the Ministry of Lands and Agriculture to coherently execute plans or programs.

This problem is acute in the agricultural planning unit where only 3 of 24 planners are Zambian and the extant staff feels under constant pressure to respond to situational crises. Agricultural planning is further undermined by the paucity of data and its unreliability, both a function of the shortage in manpower regarding data collection and evaluation capabilities. These constraints in planning further affect the ability of the GOZ to meet informational demands of potential donors. With no pipeline providing well-evaluated studies prior to submission of a proposal for assistance the GOZ cannot provide international donors with the kinds of information necessary to make sound judgments on the workability of these projects. These problems are mirrored within the planning units in extension and the parastatals as well. NAMBOARD and the TBZ are frequently cited in regard to this dilemma. Seeds, fertilizers and pesticides often fail to reach the farmers when they are most needed and the transport of and payment for produce are frequently delayed.

In part, this lack of planning could be lessened by more effective coordination among existing personnel. The autonomy of the university, for example, is such that there is little interaction between the University of Zambia and the Ministry of Lands and Agruculture. This means that what agricultural research does occur at the University of Zambia is often not related to the Government's information and research needs. Further, the university teaching staff, which could be of great asssitance in improving the quality of agricultural teaching and inputs at FTC's and FI's, almost never occurs as the staff doesn't visit, teach in, or otherwise assist this important

extension function.

Another example of poor coordination can be seen in the decision making process re: the location of infrastructure and services. Local roads, for example, are critical in improving the ability of farmers to move produce and receive assistance. Their location, however, is determined by rural councils who decide upon such locations without consulting the extension or other MLA staff.

The quality of field staff is partly responsible for its lack of coordination. Given personnel shortfalls and the enormity of its assigned tasks, field staff often lack the time or the ability to develop a more coordinated effort. Thisseems to be exacerbated by a kind of "territorial imperative" which isolates units from one another. Whatever the roots of this dilemma, one clear result is a serious morale problem within the ministry and within the agricultural sector in general.

And what of coordination with and among international donors? Here to; the failure to more effectively coordinate activities not only weakens the overall efficiacy of assistance but often intensifies manpower problems. This writer, for example, in an interview with one such donor (Sweden) informed the representative of an agreement just reached between the GOZ and another donor (Canada) for the same project it was considereing funding (in this case it was technical assistance). In another case, three donors (the Netherlands, the Federal Republic of Germany and Norway) began independent projects in the same area in the northwest placing unresolvable manpower constraints upon the Zambian field personnel in that region.

The demand by donors for bilateral assistance tied to "buy ours" policies has left the country strewn with inoperative equipment whose parts are not transferable and whose service personnel simply lack the ability to repair such equipment, given the need for specialized training in so doing. When the issue of better coordination among donors and the GOZ was raised everyone queried agreed that it was a good idea but saw political problems hampering such coordination. In the absence of some kind of coordination, however, such assistance proffered with the best of will may in fact

be making Zambia's ability to get on with the business of developing its agricultural potential more rather than less difficult.

What,then,are the areas where U.S. assistance could most effectively assist the GOZ in realizing its plans to transform this vital sector? Some have been cited already. Here, they will be divided into the three categories cited above.

Delivery of Services to Farmers

The GOZ has indicated that one of its priorities in agriculture will be the decentralization of services in order to make them more responsive and accessible.[20] This aim should be definitely encouraged but its realization will highlight the constraints mentioned above. A number of major inputs could serve to ameliorate the existing and future personnel situation. Chief among them would be :

1) Supporting and/or augmenting the FAO in in-service training programs about to begin.[21] This project concentrates upon the extension service but such training is needed throughout the Ministry of Lands and Agriculture. Management, accounting, research, technical and communication skills are especially critical - all skills that the U.S. could provide extensive assistance in. All could interface with the World Bank project[22] to upgrade the physical facilities and the number of FTC's and FI's.

2) Curriculum review assistance to make FTC's and FI's more effective within the framework of a decentralized system would be a low cost but important input. A common complaint registered by interviewees was that these units provide the same material (i.e. courses in maize, cotton, and groundnut production) to farmers regardless of region. Further, these FTC/FI courses are "one shot" affairs with no advanced courses and little coordination and/or follow-up by local extension agents. A staged (?) curriculum with extension and parastatal officer involvement and follow-up services would heighten the utility of these units and improve coordination in the field.

3) Support for a crash program to increase the number of women serving

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20/ Second National Development Plan and The Current Economic Crisis... .

21/ See In Service Training....

22/ see p.18.

in the extension and other field services. Such a project would entail close coordination with the GOZ in developing remedial and "topping off" math and science courses, provision of more adequate accommodations at training facilities and "socialization" of the extant male dominant staff.

4) Improvement in the training of cooperative officers through in service training and at the NRDC level. Here emphasis should be upon management, credit, accounting and development skills. Similar training capabilities are needed in virtually alll parastatals.

The Formal Agricultural Education Sector

U.S. intervention opportunities in the formal agricultural education sector interface with those mentioned above. These could include:

1) Greater education and communications for a realistic number of youth officers overseeing young farmers clubs and relevant teacher training such that school gardens at the primary level would cease to be seen as vehicles for punishing students.

2) Improvement of teacher training capabilities at the NRDC so that the status and capabilities of agricultural vocational teachers in secondary schools would be perceived as being at least equal to those of formal subject counterperts.

3) Curriculum review and revision at the NRDC and ZCA in order to impart the knowledge gained at these institutions more effectively in the field. This would entail more attention to practical courses as well as communication/teaching skills. Individuals singled out for careers as FTC and FI officers should receive greater amounts of teaching/communication skills.

4) Upgrading of physical facilities at NRDC and ZCA's in order to make more effective teaching capabilities of staff. Library, equipment, kitchen and dormitory facilities are all in need of enlargement.

5) Provision of graduate training opportunities to assist the GOZ in its indigenization effort, improve the quality of instruction and establish a more manageable teaching load.

22/ Zambia- A Basic Economic Report Annex 3: Education and Training (Washington, D.C. World Bank, 1977), p.16.

6) At the university level a thorough curriculum review is needed along with staff assistance. Emphassis upon the relevant and practical should be the focus of such an intervention. A new campus has been proposed at Solwesi. Virtually all interviewees queried about this option agreed with the need for a new campus but to a person rejected Solwesi as the optimum site. AID should avoid involvement in this highly political issue until further clarified by the GOZ.

7) Assistance to the business school at Ndola was specifically requested. This should be undertaken and could be achieved along with the introduction of relevant agriculturally -related courses there.

Coordination

1) AID should take the lead in establishing a mechanism for greater coordination among donors and the GOZ. Perhaps a UN agency such as UNDP would be the least objectionable one to head such a body. Quarterly meetings would be sufficient.

2) Greater effort at multilateral assistance should be made. This would address the problem of overtaxing the capabilities of extant GOZ agricultural staff and lessen the cost of projects to individual donors.

3) A thorough management and coordination study should be undertaken to determine how present disparate units within the GOZ might better coordinate and focus their activities to achieve optimum effectiveness in the realization of Zambia's agricultural potential. Improvement of manpower through training would go a long way toward making greater coordination possible.

4) The planning and research units must be upgraded. Training and technical assistance would prove extremely beneficial here.

The constraints enumerated above are hardly new. In 1960, the colonial government recognized the duality that had already emerged as a result of the dependence upon at the cost of the rural sector. It stated:

"Thus economic development is needed urgently for three purposes: to

combat poverty with its attendant social and political evils; to help restore the balance between the economies of the rural and urban areas; and to encourage the African who will no longer be able to find employment in the town to take up productive work in the country... Productive work for a high proportion of our young people leaving school must be found in the rural areas if it is to be found at all. If it is not found political and social consequences will be serious. This problem must be tackled now if it is to be solved."[23]

Eighteen years later, the observation would be made "there has been a marked disparity in growth rates between the two sectors with all growth and development emanating from the monotized mainly urban sector. In contrast the rural subsistence sector has stagnated. Moreover, a government policy of suppressing agricultural producer prices to keep food costs down (substantially reversed in recent years), in combination with tariffs on imported manufactured goods turned the domestic terms of trade against agriculture and provided a powerful incentive in favor of the production of urban over agricultural goods. The substantial disparity in rural-urban incomes and consequently in living standards has resulted in a raised rural-urban migration which has worsened the unemployment situation in the major city centers. The unemployment problem has been exacerbated by a deceleration of growth in the modern sector and by increasingly capital intensive (?) production methods compounded by a high population rate."[24]

Declining copper prices have given the GOZ virtually no alternative. It must make good on its claims regarding the primacy ofagriculture. With its own long history and record of agricultural performance the U.S. is in a uniquely

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23/ Northern Rhodesia, Report of the Rural Economic Development Working Party (Ndola: 1960), pp.4-5.

24/ The Current Economic Crisis..., p.1.

strong position to assist Zambia in realizing its agricultural potential. Political and ethical realities compel it to do so.

Department of Labour, Labour Market Review, 1977 (Lusaka: Gant Printer, 2978_

Development and Planning Unit, Educational Statistics, 1974 (Lusaka: Ministry of Education, 1976)

Roger A. Sedjo, Zambia (Washington, D.C.: Robert R. Nathan Associates, 1977)

G. L. Godel, An Analysis of Zambia's Agricultural Camps, 1972 (Lusaka: Department of Agriculture, 1973)

N. Mukutu, The Department of Agriculture Extension Services (Lusaka: Department of Agriculture, 1975)

P. H. Coombs, Attacking Rural Poverty: How Nonformal Education can Help (Washington, D.C.: IRBD, 1974)

G. S. Gaskill, Production Unit Management (Lusaka: ZAHEDA, M.D.)

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A P P E N D I X D

Chapter 3 of

Educational Reform, Proposals and Recommendations

Ministry of Education, Republic of Zambia

October 1977

CHAPTER 3

THE NEW EDUCATION SYSTEM

Introduction

1. The changes which will come about as a result of the educational reforms will not merely consist of changes in the structure and the accompanying nomenclature, or in the improvement and acquisition of new physical facilities or changes in organisational patterns. While these changes in the framework are part of the major and essential elements of the reforms, it is the content, the methods and the organisation which must receive the greatest attention and these aspects embrace meaningful reform in the curriculum leading to its enrichment and being made more relevant to the needs and aspirations of the individual and society. Appropriate teacher education should be undertaken to enable the teacher not only to understand, but also to be involved in the development of the new curriculum and make necessary adjustments in his own attitudes and approach. The developments and provision of adequate literature and other educational materials to interpret the curriculum in the context of the changes envisaged will also have to be done.

2. Reforms, therefore, must involve change in direction, in depth and in breadth. They should include a substantial change in the intrinsic value of the educational enterprise and should, therefore, take into account the various factors which are the basis of the interplay between the education system and society. They should seek to improve quality without sacrificing quantity so that the majority of the people, if not all, should benefit from effective implementation of the changes.

3. In discussing the major components of the structure of the new education system, therefore, it is intended that the components should serve as a framework of the vehicle which will carry the essential elements of the reform exercise. In short, there are dynamic and quantitative elements as well as qualitative aspects to be looked at in the process of implementation.

The new structure

4. UNIP policies stipulate that there should be provided "compulsory basic ten years of education" for every child within the decade 1974 to 1984. Although this is laudable, there is need for a variation of this policy statement with regard to the stipulated duration while the general principle of providing universal basic education remains unchanged. Instead of ten years of universal basic education, the ultimate goal should be to provide nine years of universal basic education, whereby a child entering Grade 1 at the age of seven will remain in school for at least nine years until the end of Grade 9 at the age of sixteen.

5. This nine years of basic education is a common feature in most developing and developed countries and, in the case of Zambia, it offers opportunity to design the programmes of basic education and of senior secondary in a manner that would meet the needs of an enhanced curriculum.

6. The seven years of primary plus two years of the junior secondary, in terms of the enriched curricula, would be sufficient to prepare the child to proceed to the next stage, or to leave school. What the child will have learnt by this time should be sufficient and lasting to enable him to play a full and useful role in his community if he leaves school. On the other hand, senior secondary would begin at Grade 10 and last for three years, giving more time for in-depth study in each field so that those who may have the opportunity to specialise in technical, scientific, cultural and artistic fields, etc. during the next stage of education, will have good grounding.

7. At present, the work of senior secondary classes begins to be taught at Form III (Grade 10) because there is not sufficient time in the present two-year senior secondary period to cover it. Yet, Form III is part of the junior secondary and is the terminal point and those who leave school are overloaded with sections of the curricula which may not be really necessary.

8. The arrangement, in terms of curriculum organisation when universal basic education is achieved, should be six years of primary, three years of junior secondary and three years of senior secondary. Unlike at present, this arrangement would not provide for a terminal point in the primary sector, since at this time the terminal point will be at the end of Grade 9 following three years of junior secondary.

9. This arrangement should, therefore, facilitate the effective implementation of the curriculum objectives for primary, junior secondary and senior secondary as there will be adequate time allocated to each unit of the educational ladder. It would also make it easier to rationalise teacher training programmes. For example, the teachers of the pupils in the first six Grades would be Grade 9 graduates who will have had three years more educational background than the pupils they are going to teach. The teachers of Grades 7 to 9 would be ex-Grade 12 who would have three years more educational background than their pupils; while the teachers of Grades 10 to 12 would be University graduates or their equivalents in specialised field. This should contribute to the improvement of quality generally, in addition to other measures discussed in later chapters.

10. Further, with the nine years universal basic education, there would be a saving in capital and recurrent expenditures as the resources would then be applied to fewer people who really have need for Grade 10 to enable them to complete Grade 12 satisfactorily.

11. The structure of the new education system is described in broad outline in this chapter and is represented in schematic form in the diagrams at pages 10 and 11. A tentative approach in the implementation of UNIP policies on education is indicated and in the process the problems of interpretation and feasibility are also mentioned but are discussed fully in later chapters.

Pre-school education

12. Pre-school education is intended for children below the age of seven who normally will not have started full-time education. However, pre-school education will not be available to every child for a long time to come but its development, through provision of more facilities to cater for more children, both in rural and urban areas, will be encouraged along the lines described in the chapter dealing with Pre-school Education.

Full-time education

13. This part of the education system would cater mainly for the young generation who are full-time students in schools and colleges. Their curricula will include production activities and, therefore, the concept of Production Units will be consolidated into their normal school activities.

14. Full-time education will, as at present, begin at the age of seven when children enter Grade 1. Children will remain at school until they complete Grade 9, which is the end of the nine years basic education programme (completion of primary and junior secondary). Some will leave full-time education at this point, while others may continue with second stage programmes at secondary schools, trade institutes, agricultural and other training institutes. Some of the graduates of the second stage will enter third stage programmes at universities, training colleges, technical colleges and other institutions of higher learning.

15. In the new structure, there will be three successive stages of full-time education as follows:

1 *Basic Education*

(a) This first stage will aim at providing general education, including some practical skills and a sound foundation for further full-time or part time education. The ultimate goal is to provide nine years universal basic education.

(b) Due to insufficient number of school places available at present in Grades 1 and 5, and in Forms I and IV (Grades 8 and 11), the achievement of nine

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CHAPTER 3

THE NEW EDUCATION SYSTEM

Introduction

1. The changes which will come about as a result of the educational reforms will not merely consist of changes in the structure and the accompanying nomenclature, or in the improvement and acquisition of new physical facilities or changes in organisational patterns. While these changes in the framework are part of the major and essential elements of the reforms, it is the content, the methods and the organisation which must receive the greatest attention and these aspects embrace meaningful reform in the curriculum leading to its enrichment and being made more relevant to the needs and aspirations of the individual and society. Appropriate teacher education should be undertaken to enable the teacher not only to understand, but also to be involved in the development of the new curriculum and make necessary adjustments in his own attitudes and approach. The developments and provision of adequate literature and other educational materials to interpret the curriculum in the context of the changes envisaged will also have to be done.

2. Reforms, therefore, must involve change in direction, in depth and in breadth. They should include a substantial change in the intrinsic value of the educational enterprise and should, therefore, take into account the various factors which are the basis of the interplay between the education system and society. They should seek to improve quality without sacrificing quantity so that the majority of the people, if not all, should benefit from effective implementation of the changes.

3. In discussing the major components of the structure of the new education system, therefore, it is intended that the components should serve as a framework of the vehicle which will carry the essential elements of the reform exercise. In short, there are dynamic and quantitative elements as well as qualitative aspects to be looked at in the process of implementation.

The new structure

4. UNIP policies stipulate that there should be provided "compulsory basic ten years of education" for every child within the decade 1974 to 1984. Although this is laudable, there is need for a variation of this policy statement with regard to the stipulated duration while the general principle of providing universal basic education remains unchanged. Instead of ten years of universal basic education, the ultimate goal should be to provide nine years of universal basic education, whereby a child entering Grade 1 at the age of seven will remain in school for at least nine years until the end of Grade 9 at the age of sixteen.

5. This nine years of basic education is a common feature in most developing and developed countries and, in the case of Zambia, it offers opportunity to design the programmes of basic education and of senior secondary in a manner that would meet the needs of an enhanced curriculum.

6. The seven years of primary plus two years of the junior secondary, in terms of the enriched curricula, would be sufficient to prepare the child to proceed to the next stage, or to leave school. What the child will have learnt by this time should be sufficient and lasting to enable him to play a full and useful role in his community if he leaves school. On the other hand, senior secondary would begin at Grade 10 and last for three years, giving more time for in-depth study in each field so that those who may have the opportunity to specialise in technical, scientific, cultural and artistic fields, etc. during the next stage of education, will have good grounding.

7. At present, the work of senior secondary classes begins to be taught at Form III (Grade 10) because there is not sufficient time in the present two-year senior secondary period to cover it. Yet, Form III is part of the junior secondary and is the terminal point and those who leave school are overloaded with sections of the curricula which may not be really necessary.

8. The arrangement, in terms of curriculum organisation when universal basic education is achieved, should be six years of primary, three years of junior secondary and three years of senior secondary. Unlike at present, this arrangement would not provide for a terminal point in the primary sector, since at this time the terminal point will be at the end of Grade 9 following three years of junior secondary.

9. This arrangement should, therefore, facilitate the effective implementation of the curriculum objectives for primary, junior secondary and senior secondary as there will be adequate time allocated to each unit of the educational ladder. It would also make it easier to rationalise teacher training programmes. For example, the teachers of the pupils in the first six Grades would be Grade 9 graduates who will have had three years more educational background than the pupils they are going to teach. The teachers of Grades 7 to 9 would be ex-Grade 12 who would have three years more educational background than their pupils; while the teachers of Grades 10 to 12 would be University graduates or their equivalents in specialised field. This should contribute to the improvement of quality generally, in addition to other measures discussed in later chapters.

10. Further, with the nine years universal basic education, there would be a saving in capital and recurrent expenditures as the resources would then be applied to fewer people who really have need for Grade 10 to enable them to complete Grade 12 satisfactorily.

11. The structure of the new education system is described in broad outline in this chapter and is represented in schematic form in the diagrams at pages 10 and 11. A tentative approach in the implementation of UNIP policies on education is indicated and in the process the problems of interpretation and feasibility are also mentioned but are discussed fully in later chapters.

Pre-school education

12. Pre-school education is intended for children below the age of seven who normally will not have started full-time education. However, pre-school education will not be available to every child for a long time to come but its development, through provision of more facilities to cater for more children, both in rural and urban areas, will be encouraged along the lines described in the chapter dealing with Pre-school Education.

Full-time education

13. This part of the education system would cater mainly for the young generation who are full-time students in schools and colleges. Their curricula will include production activities and, therefore, the concept of Production Units will be consolidated into their normal school activities.

14. Full-time education will, as at present, begin at the age of seven when children enter Grade 1. Children will remain at school until they complete Grade 9, which is the end of the nine years basic education programme (completion of primary and junior secondary). Some will leave full-time education at this point, while others may continue with second stage programmes at secondary schools, trade institutes, agricultural and other training institutes. Some of the graduates of the second stage will enter third stage programmes at universities, training colleges, technical colleges and other institutions of higher learning.

15. In the new structure, there will be three successive stages of full-time education as follows:

1. *Basic Education*

   (a) This first stage will aim at providing general education, including some practical skills and a sound foundation for further full-time or part-time education. The ultimate goal is to provide nine years universal basic education.

   (b) Due to insufficient number of school places available at present in Grades 1 and 5, and in Forms I and IV (Grades 8 and 11), the achievement of nine

years of full-time universal basic education cannot be immediately accomplished, not even by 1984 when it may be expected that Party policies on education will have been fully implemented. However, the goal of nine years universal basic education can be achieved over a period of time through phased expansion of facilities and increased resources.

(c) As a first step towards nine years universal basic education, it will be necessary during the Third National Development Plan to begin on the expansion of facilities so that significantly many more seven-year-old children than at present can enter Grade 1. Grades 1 – 7 will constitute the first phase of basic education while Grades 8 – 9 will constitute the second phase.

(d) In the interim period before nine years of universal basic education is achieved, students will continue to be selected at the end of Grade 7 to embark on the second phase of basic education.

(e) Those who leave full-time education after Grade 7, during the interim period, would have the opportunity to enter available appropriate programmes in continuing education or join other fields of training and productive activities such as the agricultural sector and various skills training programmes in crafts and trades.

(f) When nine years universal basic education is ultimately achieved, there will be a continuous programme from Grade 1 to 9 with the curricula organised on the basis of six years of primary and three years of junior secondary.

(g) The achievement of nine years universal basic education may take a long time, but the Party and Government should persistently work towards its accomplishment.

2. *Second Stage*

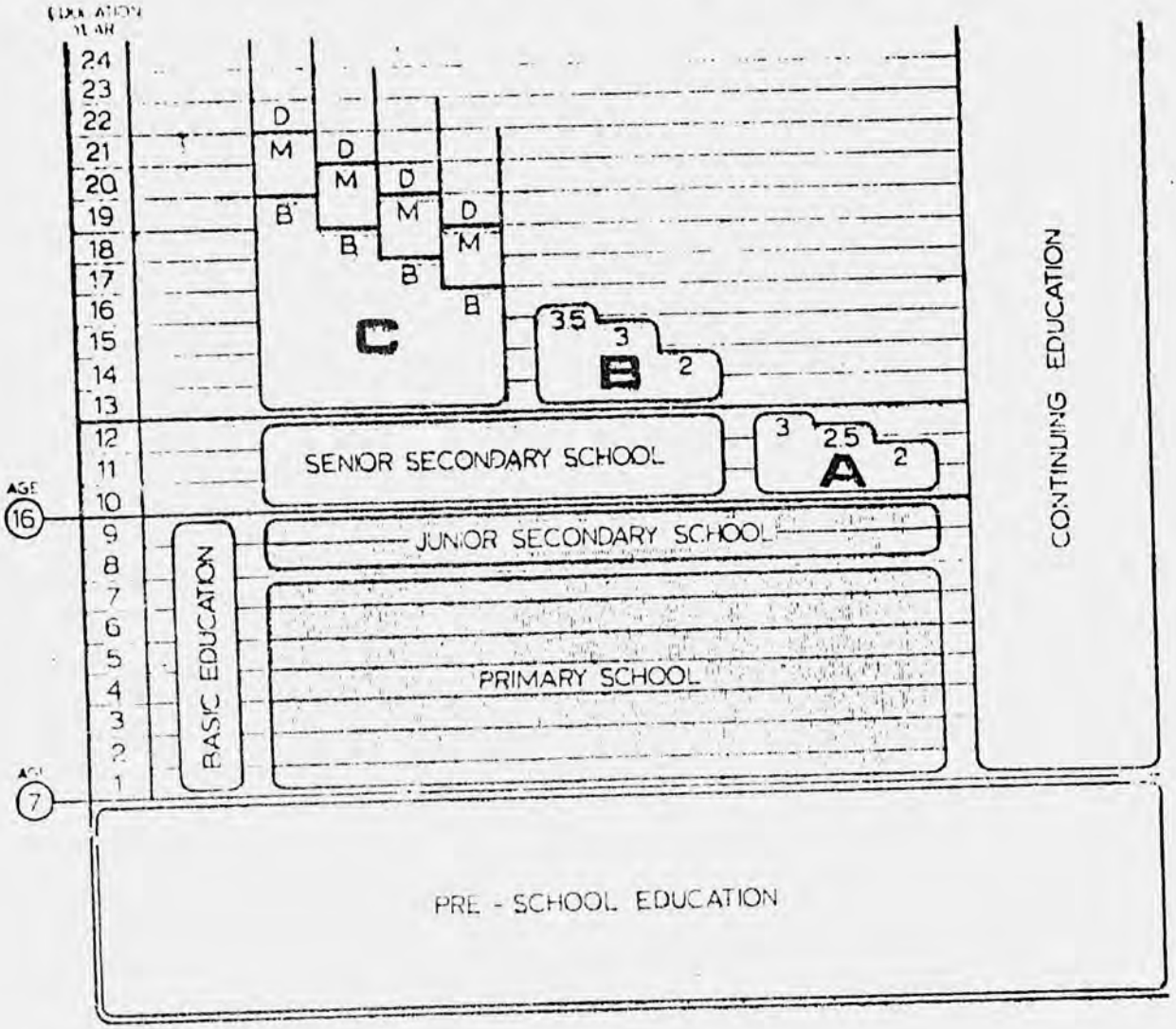
(a) At the end of Grade 9 students may be selected to enter full-time general education programmes for Grades 10 – 12 (Forms III to V). They may also be selected to pursue specialised training programmes such as the Zambian Enrolled Nurses' Course, trades training courses, etc. All second stage programmes will be properly co-ordinated to avoid unnecessary over-lapping, to improve efficiency and to maximise the use of facilities and available manpower.

(b) Some of those who leave full-time education at this stage may join the world of work, pursue training programmes in various sectors of the economy and may take advantage of Continuing (part-time) Education programmes.

3. *Third Stage*

(a) Within this stage there is a wide range of fields of study, such as advanced specialised programmes leading to the Diploma in Teaching, Diploma in Technology, Diploma in Nursing, Diploma in Agriculture, etc., and programmes to be taken at university level. There is, therefore, a wide variety of programmes or courses for which Grade 12 graduates could be selected. Further, some candidates for these programmes would be Grade 9 graduates who through further study or other appropriate training may meet entry requirements to such programmes. Co-ordination of the programmes will be undertaken as at the second stage and for the same reasons (see para. 15 (2) (a))

Interim structure of education



NOTES

A Various vocational programmes, e.g., Trades, Nursing, Teacher Training, etc., leading to a certificate.

B Various programmes, e.g., Agriculture, Technology, Commerce, Nursing, etc., leading usually to a diploma

C University degree:

D = Doctorate
M = Master
B = Bachelor: 4 years – Ordinary
5 years – Engineering, Agriculture, etc.
6 years – Veterinary Science.
7 years – Medicine.

NB

In **A** and **B** there are also some courses which take less than 2 years.

From primary to senior secondary an education year represents a grade.

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(d) In the interim period before nine years of universal basic education is achieved, students will continue to be selected at the end of Grade 7 to embark on the second phase of basic education.

(e) Those who leave full-time education after Grade 7, during the interim period, would have the opportunity to enter available appropriate programmes in continuing education or join other fields of training and productive activities such as the agricultural sector and various skills training programmes in crafts and trades.

(f) When nine years universal basic education is ultimately achieved, there will be a continuous programme from Grade 1 to 9 with the curricula organised on the basis of six years of primary and three years of junior secondary.

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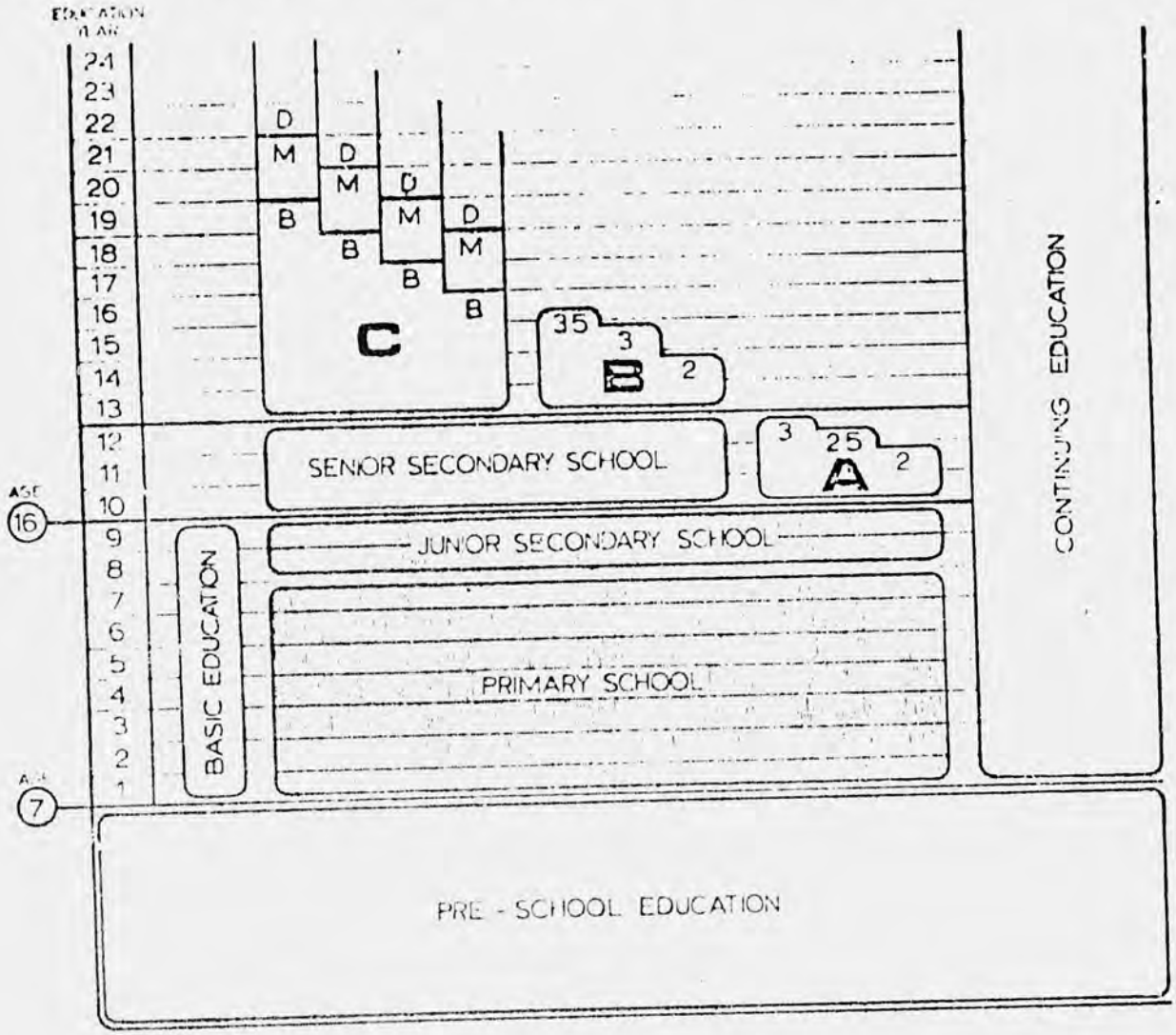
Interim structure of education



NOTES

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B Various programmes, e.g., Agriculture, Technology, Commerce, Nursing, etc., leading usually to a diploma.

C University degree

D = Doctorate

M = Master

B = Bachelor 4 years – Ordinary
5 years – Engineering, Agriculture, etc.
6 years – Veterinary Science.
7 years – Medicine

NB

In A and B there are also some courses which take less than 2 years

From primary to senior secondary an education year represents a grade

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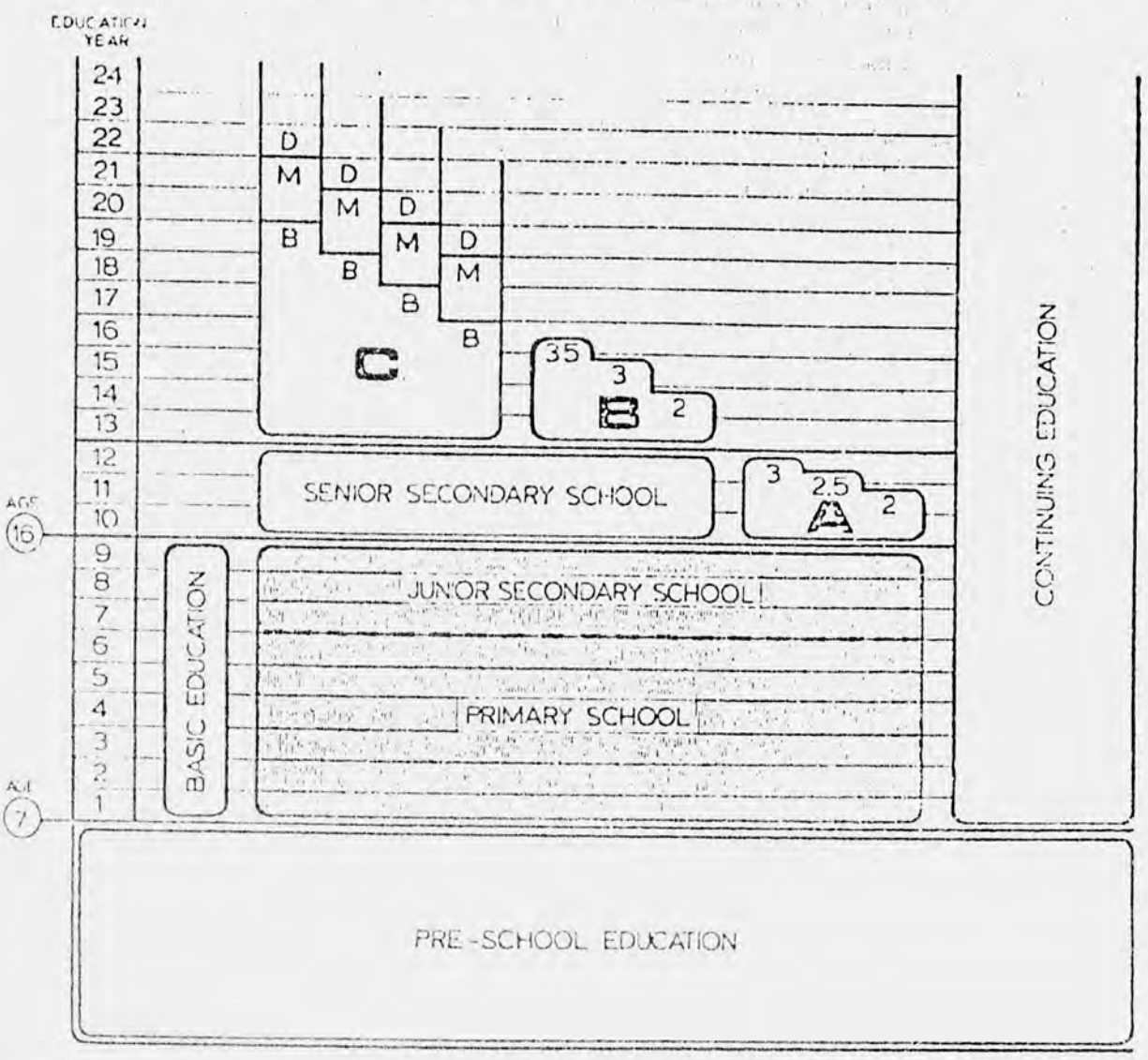
Final structure of education



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D = Doctorate.
M = Master.
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5 years – Engineering, Agriculture, etc.
6 years – Veterinary Science.
7 years – Medicine.

NB

In A and B there are also some courses which take less than 2 years.

From primary to senior secondary an education year represents a grade.

Continuing education

16. This part of the education system will ca[illegible] or adults or youths who have left full-time education or may never have entered [illegible] but may wish to engage in education and training by part-time study. The scope is wide[illegible] in this document, attention is focused on the following four aspects:

(a) *Literacy education*: literacy education is necessary to enable illiterate persons, both youths and adults, to achieve mastery of the basic skills of reading, writing and reckoning.

(b) *Formal education*: part-time study will provide access to formal education at Basic, second and third stage levels of education.

(c) *In-service training and workers' education*: in-service education is aimed generally at increasing the understanding, competence and productivity of persons in the world of work and, therefore, enables workers to improve their vocational and professional skills. Workers' education deals with a variety of subjects or topics which mainly are the responsibility of the Ministry of Labour and the Department of Industrial Participatory Democracy, with which the Ministry of Education will continue to co-operate in order to ensure proper co-ordination of programmes.

(d) *Cultural and recreational education*: cultural and recreational education offers programmes for adults and out-of-school youths in art, crafts, music, dance, drama, language, sports, etc.

National Service Training

17. In terms of the provisions of the Zambia National Service Act, No. 35 of 1971, at some stage students, like other youths, are liable for call-up by the Zambia National Service. Further, under Zambia National Service (General) Regulations, 1973, Statutory Instrument No. 2 of 1973, Heads of prescribed institutions are required to furnish the Zambia National Service with names and particulars of students in Form V or its equivalent for the purpose of enlistment.

18. According to directives issued by the Ministry of Defence in 1975 in terms of the provisions of the Act governing the Zambia National Service, Form V graduates are required to enlist in the Zambia National Service and fulfil the requirements of the Act before entering the world of work or before they are admitted to colleges or other institutions of higher learning within or outside Zambia.

19. Therefore, the present practice, whereby Form V school-leavers are called up for National Service duties and thereafter to undertake skills training and production programmes, may continue subject to the requirements and exigencies of the service, in terms determined by the Ministry of Defence as is the case now. The period of service for those selected for University programmes or for programmes at training colleges or other institutions may be broken into two parts as at present, or into such other shorter periods as may be decided upon, from time to time, by the Ministry of Defence in terms of the provisions of the Act.

20. During their National Service period the students may continue their formal education by part-time study, through correspondence, or by attending locally organised classes where this is possible.

21. During their National Service period, students may also engage in various activities, drawing upon the skills they are learning or have learnt, or may be involved in fields relevant to their previous education or training; for instance, teaching in schools, literacy work, agricultural production, industrial production, manufacturing, technical and craft work, community development work, etc.

22. Before permanently entering the world of work, students may need guidance in their careers. In this case, the Occupational and Assessment Services in the Ministry of Labour and Social Services, in consultation with the Ministries of Education and Defence, should give the

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DISCUSSION PAPER

PROJECT ZAM/77/004

Project for In-service Training and Development of the Agricultural Extension Service in Zambia

AIMS AND OBJECTIVES OF THE PROJECT

a. Immediate objectives:

The immediate objective is to develop and strengthen the effectiveness of agricultural extension work in a particular province or region, as a pilot endeavour, by employing new techniques and upgrading extension staff with intensive in-service training.

b. Long-term objectives:

Following the experience and results of the pilot approach, to upgrade and develop the national agricultural extension service in Zambia, by employing new techniques and intensive in-service training.

Further and subsequent aims include raising the productivity and production of the agricultural producer in the country, with particular emphasis on the smaller and poorer farmer. In turn, this will lead to increased incomes and employment in the rural areas, encouraging rural people, particularly rural youth, to take up farming as a vocation, thus stemming the drift to the urban centres.

PROJECT JUSTIFICATION

a. Background:

Zambia has a total land-area of some 74.3 million hectares, of which about 68 million is potentially arable land. The area available for agriculture, however, is estimated at 18 million hectares, with a total area intermittently cropped of about 14 million; of this only 2.1 million hectares are harvested annually. This represents less than 3% of the total arable land.

The agricultural sector is dualistic, with around 630,000 smallholders (most of them subsistence farmers), 800 commercial farmers and some specialised state farms. The subsistence farming families represent more than 60% of Zambia's population, but production from this group amounts to only two-thirds of the total agricultural output, the remainder coming from only a few hundred commercial farmers.

The share of agriculture in the nation's Gross Domestic Product has fallen, over the thirteen years since Independence, to around 11%. Agriculture in recent years has expanded at just over 1% per year, with an overall growth for the ten-year period ending 1974 of .7% annually, compared with the total Gross Domestic Product growth-rate of 3.4% annually. A similar trend is seen in population growth: 1.2% annually in the rural areas in recent years, compared with the national average of 3%. The drift to the urban centres is plain from the urban growth rate of nearly 7% annually in the 1969-74 period.

In the 1969-74 period, Zambia was in the unsatisfactory situation of experiencing an actual decline in its food self-sufficiency: during the last few years, 40% of the food marketed has been imported. Imports of foodstuffs and tobacco reached almost K.45 million in 1974 - nearly 9% of the total import bill.

In 1975, some 300 technical-assistance personnel from other Governments and organizations were in the agriculture and fisheries sector in Zambia, representing only 13% of the total number of such personnel. This is one indicator of the agricultural sector's need for a greater share in development assistance, in particular expertise, to accelerate its growth. One of the key areas for stimulation of agricultural production is the development of the subsistence farmer, to increase his yields and hence total production; this group traditionally has relied mainly on labour as the chief input for their farms. There are several complex reasons for their low yields.

The climate and soils of Zambia hold promise of considerable improvement in productivity of the land: an indication of the possibilities may be summarized from the Ministry's estimates in 1974:

YIELDS IN METRIC TONS PER HECTARE

Crop	Large commercial farmers	Improved village farmers	Traditional (subsistence) farmers
Maize	5.03	1.22	.58
Potatoes	12.00	6.00	4.00
Vegetables	16.00	6.00	4.00

Because of the highly capitalized structure of the large commercial farms and their use of considerable farm inputs such as fertilizers, it is not feasible to contemplate yields of similar dimensions for the subsistence farmer; but every attempt should be made by encouraging the small farmer to achieve at least the yields of the improved village farmer group: in the case of maize, this would mean a doubling of production per hectare. Even if production and incomes of subsistence farmers could be increased by 20% over the next five years, this would mean substantial progress towards the nation's self-sufficiency in food and a considerable increase in income-levels in the rural sector.

b. Government policy:

The long-term objective of Government is to make the agricultural sector as productive as possible. The principal objectives are identified as:

1) raising rural levels of living and creating a self-reliant and progressive rural society
2) creating new employment and income opportunities to stem urban drift
3) developing self-sufficiency in staple foodstuffs
4) improving nutritional standards and consumption of protein-rich foods by means of increased production.

In pursuit of these objectives, the policies of Government which have been enumerated by the Ministry of Lands and Agriculture include: -

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- equal distribution of wealth
- increase in production of raw materials such as cotton, tobacco and oilseeds
- a pricing policy
- ready and adequate availability of inputs
- reorganization of the marketing institutions
- improvement and rationalization of the technical and extension services and credit facilities
- greater encouragement and stimulation of co-operatives
- encouragement of ox-ploughing
- establishment of irrigation schemes
- rural development to encourage the awakening of local leaderships and initiatives at village level
- planning, with emphasis on starting from grassroots level with a view to involving as many people as possible in the preparation of development plans.

In keeping with the philosophy of Humanism, the need is for "production by the masses and not mass production," designed to encourage the people themselves, together with the Party and the Government, to work out methods for ensuring that everybody has something productive and profitable to do, thus contributing to the production of the nation as a whole.

c. <u>The extension service</u>:

This is the main arm of Government which deals with farming families in the villages throughout the country. This service in Zambia is very young, in terms both of age and of quality of staff and functions. It has, however, grown into a sizable and complex unit, so organized as to meet the challenges of attaining the national goals for agriculture. A number of constraints have hindered the effectiveness of the impact of the extension service - in particular, lack of transport for the field workers to visit the

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farmers; the feeling of isolation and lack of recognition of their efforts in the more distant areas; inadequate housing and work incentives, particularly for the junior field staff; and, above all, the lack of sound training consistent with their needs and situation.

Weaknesses in the present extension approach have been summarized as -

" a. Absence of a systematic, frequent and comprehensive programme of training for Agricultural Assistants and Commodity Demonstrators.

b. Lack of programmes of work with farmers.

c. Too much reliance on Landrovers.

" The combined effect of these three factprs is that there is a large but essentially ineffective extension service, with many members of staff who cannot discuss problems with farmers for any sufficient length of time . . . . It is necessary to evolve an extension approach compatible with the spirit of the nation."

The present numbers in the extension service are approximately 900 Commodity Demonstrators (these are lower-level fieldworkers who have been trained to work on a particular commodity, e.g. maize, but are required to work under supervision); some 424 Agricultural Assistants, supervised in turn by 296 Senior Agricultural Assistants; and a professional staff of 56 graduates. Apart from visiting the farmers in the villages, this staff is also used in the short-term training-courses for farmers in the 32 Farmer Training Centres, and in the eight Farm Institutes throughout the country.

d. Links with other organizations involved in farm extension work:

1) Governmental organizations. Unofficial and parastatal organizations in the field include co-operatives, which in turn have 66 extension

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workers for their own areas of activity, and over 300 co-operative field staff. There are some 228 farmers' co-operatives with nearly 3,000 members; the emphasis is on marketing of agricultural products.

The Namboard is concerned with marketing and distribution of farm inputs, as well as with purchase of farm produce.

The Agricultural Finance Corporation is responsible for provision of farm credit.

There are a number of specialized Boards, notably the Tobacco Board.

2) Non-Governmental involvement:

FRG bilateral assistance is concerned with an integrated rural development project in the Northwest Province, covering a limited number of villages and working alongside the extension service in that province, with a number of expatriate experts in the field.

SIDA and DANIDA are deeply involved in the agricultural development of Zambia. Twenty-two experts are assisting in the co-operative movement; in addition, these two bilateral agencies are developing, with the assistance of Government, three (and shortly a fourth) Intensive Development Zones with a similar integrated rural development approach, emphasising extension work, and giving backup logistical support such as transport and provision of farm inputs. The three IDZ's so far are in three provinces (Northern, Eastern and Southern) and focus on a specific target group of several hundred farmers in each zone.

The World Bank is presently preparing a project to strengthen and develop the Farm Institutes and Farmer Training Centres in two provinces - Northern and Eastern. This project involves expenditure on buildings and water-supply, and on audio-visual and transport equipment.

Dutch bilateral aid is collaborating in this project with the provision of three technical experts to guide and develop the

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programmes in the Training Centres. A further contribution to extension by Dutch bilateral aid is provision of bicycles for all extension field staff.

e) The role of the UNDP/FAO project:

The project as presently envisaged is designed to develop and increase the effectiveness of the extension staff, with emphasis on the field workers making daily contact with the farmers at village level. This project would supplement and further extend the work being carried out in the Farmer Training Centres; the main focus of the project is development of the method of contact with the farmer on his own land.

In addition, the project would assist in the training of extension and other professional agricultural officers in planning at provincial and district level, and in identifying and preparing project proposals to meet crucial needs in the rural areas.

The project is in the nature of a pilot endeavour, working in one province for 3½ years from July 1, 1978. After assessment of its impact, similar approaches would be made throughout the country.

THE PROJECT CONCEPT

a. Description and method:

The method envisaged in carrying out the pilot extension project is a change from the present ineffective system to an intensive approach, where "contact farmers" will be selected, one or two in each village (elected or proposed by the Village Productivity Councils) and the extension staff will work through these farmers, using their farms as demonstration units. This is similar to the "model farmer" approach used in Comilla province in Bangladesh and in areas in India. There will be two or three contact farmers in "ward," with a bicycle range of the villages they serve. Four or five groups will

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constitute a "station," where there will be a senior agricultural assistant who will be constantly roving, checking on the field work of the agents in the camps; he will be equipped with a motor-cycle. Several stations, depending on the size of the district, will constitute a District, where there are the District Agricultural Officer and technical support officers for specialised operations such as plant protection and animal husbandry. Four or five districts make up a province.

The approach is to take one province (there are eight rural provinces in Zambia) and develop this as a pilot project, using this technique. Parallel with this reorganisation within the selected pilot-project province will be an intensive in-service training programme: emphasis will be placed on the approach to the farmer, and on the use of farm-management techniques rather than on the encouragement of more use of capital inputs. The target group is the subsistence farmer; the aim is to raise his productivity and total production. A special feature of the project would be the study of the farmer's motivations and response, in order to tailor the extension approach accordingly.

Attention will be paid to the integration of the extension programme in the province with the other services and institutions in the agricultural sector: e.g. co-operatives, credit agencies, supplies of inputs and marketing facilities.

A built-in evaluation system will closely monitor the results and achievements over a three-year period. Surveys will be necessary to obtain baseline data and evaluate progress after initially three years. If the pilot project proves successful, the approach will be applied nationwide.

It may be noted that the major input into the project, in terms of personnel, would be extension expertise; but expertise would also be required for the planning component.

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The first proposal, for a training-course for provincial officers, may not appear to fit into the project, being concerned with provinces outside the pilot area; it is however very important, and would of course include the officers concerned with the main part of the project.

b. The planning component:

The planning component of the extension training project would include:

1) A training-course for provincial-level officers (Heads of extension services in each of the eight provinces) plus one or two from Head Office, in project identification and project preparation. These are not necessarily economics graduates, and the content of the course would not be as advanced as is usual in courses in project preparation and analysis. Nevertheless, the Ministry of Agriculture is frequently requested to develop proposals for sound agricultural projects in the field; and in keeping with the Government policy of involving the people at grassroots level in planning and executing projects, the officers of the Extension Department, being in direct contact with the people in rural areas, should be able to translate the wishes and needs of the farming community into viable projects.

2) Study of manpower requirements of professional and technical staff in the Ministry, to clarify their needs for the Five Year Plan period beginning 1979.

3) A study leading to preparation of a plan for farm inputs of all kinds - credit, material inputs, technical expertise, transportation and marketing infrastructure - for each province; as development of their extension service will be rendered impotent without the backup support of other services. (This is a major problem in Zambia today, caused largely by poor distribution and lack of forward planning.)

4) A planning and evaluation unit attached to the project, concerned with surveys, evaluation and monitoring of project activities.

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UNDP INPUTS

a. Expertise:

The project envisages five experts including the team-leader, and 15 man-months of consultancies, with two associate experts. (See annex.) Personnel and job-descriptions are as follows:

1) Project Manager/ team leader (42 man-months). Responsibilities include ensuring that the general guidelines of the project are maintained, and carrying out the administrative measures needed for the smooth running of the project. Special responsibility would be for supervision and guidance of the associate expert in the field of agricultural economics, and for following through the methodology and procedures established for evaluation and monitoring of the project; arranging also for any special training-programmes, seminars, fellowships etc.

2) Chief Extension Adviser (36 mm, assuming that he would take up duties on October 1, 1978). This expert would be stationed in the province selected, working alongside the Chief Extension Training Officer in the area, and would visit all stations and camps, being especially concerned with the method of extension work in contact with the farmer on his own land. He would prepare in-service training programmes and ongoing monitoring of extension workers' workplans and achievements. His special responsibility would be the preparation of a fieldworker's manual. This expert's specialty would be in crops normally grown by the african subsistence farmer.

3) Farm Management adviser (33 mm). This expert would be more concerned with farming practices at village level, and with advising on improved methods of cropping, harvesting and crop-storage procedures. He would have some background in agricultural engineering of a less sophisticated type, to advise on smaller self-help and food-for-work projects at village level.

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4) Animal Husbandry Adviser (24 mm). This expert would assist the Chief Extension Adviser in preparing the training programmes concerned with livestock breeding and management. He would assist in preparing that part of the manual concerned with animal husbandry, and would train a counterpart to specialize in this field.

5) Rural Sociologist (24 mm). This expert, alongside a national counterpart, would be responsible for rural surveys, and for making a special study of the motivations and responses of the farmer to the extension effort. He would assist in devising the approach to the farmer in the village, identifying any problems in this relationship which could hold back the flow of the ideas and technology being passed on.

6) Consultants (15 mm) could be called upon when required - mainly in the field of evaluation, for the devising of a sound procedure, and mainly at the beginning and end of the pilot project. (Ongoing monitoring would be done by the project staff.)

An agricultural consultant would be required in the early stages, to devise suitable materials and advise on the purchase of the AV equipment best suited to the project's needs. If this work can be satisfactorily done with the help of the AV expert in the World bank project, then this expenditure could be saved for other purposes.

7) Associate experts (2 X 36 mm).

i) An assistant Extension adviser would be required to help the Chief Extension Adviser in carrying out field-work, monitoring stations and camps, and checking on contacts with the farmers.

ii) An irrigation [illegible] would be required to assist the Project Manager in preparing an agricultural plan for the province, especially for those items requirements and specifics for handling, transporting and processing farmers' products. (This expertise could be employed to cover the whole country's [illegible]

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A manpower study of the needs for technical personnel in the Ministry and in the rural sector generally for the coming Five Year Plan would also be an important task to be carried out. This associate expert could also assist in the monitoring and follow-up of the evaluation data.

b. Training workshop for provincial officers in the rural sector:

It is planned to hold a workshop with study materials in the latter part of 1978, with technical expertise from FAO headquarters for guidance. Such a workshop might last several weeks, depending on the availability of personnel. The object is to assist officers to identify projects in their area and to prepare project proposals, which can be further developed and expanded by the appropriate technical officers should these proposals be accepted for funding.

c. Vehicles and equipment:

1) Transport: All of the experts, including the associate experts, would require a vehicle for their work, as they would be working independently alongside their national counterparts. In most cases a four-wheel-drive vehicle would be required, as the project is one essentially concerned with reaching remote villages. Visiting consultants would also require the use of a vehicle.

As the project is aimed at developing the extension service to achieve the greatest possible impact in a particular province, it would be necessary to assist the extension service with some vehicles - at least one Landrover for each district office of that province (4) and a motor-cycle for senior agricultural assistants (20). (It is noted that Dutch bilateral assistance is providing junior extension agents with bicycles.)

2) Teaching aids and audio-visual equipment will be required for the project - in particular film and slide projectors, with small portable generators if necessary.

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3) Extension workers' manual: provision is made in the budget for a handy practical manual for use in the field.

d. Fellowships and in-service training costs:

Provision is made in the budget for holding in-service training-courses, and for possible short tours by selected officers to neighbouring countries where this is desirable and appropriate. Provision is also made for longer-term fellowships for a few specially-selected professional officers to complete their technical training.

e. Administration:

Provision is made for the minimum of administrative support - secretarial services, stationery, office equipment etc. Wherever possible, the project would utilize the services of the Farm Institutes, to avoid duplication of effort and expense.

Project starts July 1, 1978 — Annex I

FINANCIAL SUMMARY

	1978	1979	1980	1981	TOTAL
		Man months			
Expertise:					
Project Manager	6	12	12	12	42
Chief Extension Adviser	3	12	12	9	36
Farm Management Adviser	3	12	12	6	33
Animal Husbandry Adviser	3	12	9	-	24
Rural Sociologist	3	12	9	-	24
Consultants:					
Evaluation and Survey	3	1	-	3	7
Audio-visual	3	1	-	-	4
Other	2	2	-	-	4
Associate Experts:					
Assistant Extension Adviser	3	12	12	9	36
Agricultural Economist	3	12	12	12	39
		Estimated costs ($000's)			
1) Expertise	110	300	265	170	845
2) Preparatory costs, visiting missions, final report	20	-	-	10	30
3) Vehicles - 9 landrovers 1 station-wagon 20 motor-cycles camping equipt.	98	5	5	-	108
4) Workshop aids	20	5	5	5	35
5) Extension manuals	-	15	-	-	15
6) Internal travel	5	15	15	15	50
7) Vehicle operating costs	5	10	10	10	35
8) Training seminar for project preparation	20	-	-	20	40

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Estimated costs ($000's) contd.

	1978	1979	1980	1981	TOTAL
9) Followships and external travel	10	15	15	15	55
10) Administrative support (secretarial services, office supplies & equipment)	10	10	10	10	40
11) Miscellaneous & unforeseen	?	14	14	15	50
TOTALS	31[illegible]	384	334	265	1,303

Provision for Preparatory Project	$ 116,000
Provision for In-service Training Project	1,600,000
Total	$1,716,000
Extension Development Estimate	1,303,000
Balance	$ 413,000